

الجامعة  
البريطانية في  
دبي



The  
British University  
in Dubai

**The impact of nursing education curriculum and  
workforce preparation on students' critical thinking, moral  
reasoning and evaluate their perspectives on cultural  
sensitivity in UAE**

أثر مناهج تعليم التمريض وإعداد القوى العاملة على التفكير الناقد والإدراك  
الأخلاقي والوعي الثقافي لدى طالبات التمريض في دولة الإمارات العربية المتحدة.

by

**HADYA ABBoud ABDEL RAHIM ABDEL-FATTAH**

**A thesis submitted in fulfilment  
of the requirements for the degree of  
DOCTOR OF PHILOSOPHY IN EDUCATION**

at

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by

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## ABSTRACT

**Background:** Critical thinking is a vital element in developing competent and safe nursing practice. The danger of incorrect nurse's decisions on the patient's health has become a significant threat for both the nursing students and graduates. Almost half of the nurses leave their careers at the current culturally sophisticated healthcare settings as a consequence of facing daily moral distresses and ethical dilemmas after their wrong clinical judgment. **Purpose:** is to investigate the impact of the nursing education curriculum and workforce preparation on students' existing critical thinking (CT) and moral reasoning (MR) skills within the BSc nursing curriculum. Moreover, to examine the quality of clinical decision making among the UAE nursing students within culturally competent care. **Design/ Methodology/ Approach:** The researcher employed a concurrent mixed study with both qualitative and quantitative mechanisms. The quantitative data was collected from (103) participants from three nursing cohorts in the UAE, using the California Critical Thinking Skills Test (CCTST). The questionnaire was used to investigate the participants critical thinking with the moral reasoning and cultural sensitivity quality and present their (Interpretation, Analysis, Inference, Explanation, and Evaluation) scoring. The qualitative data collected from the semi-structured focus group interviews was drawn on to investigate critical thinking, moral reasoning, and cultural sensitivity perception and preparation of the participants. **Results:** Results of the data confirmed an increase in nurses critical thinking abilities when education and practice enhanced. Nursing curriculum, workplace, cultural diversity, and moral dilemmas contributed to shaping the UAE nurse's critical thinking skills while clinical experiences impacted positively on improving the nurse's decision-making and clinical judgment. Regarding the correlation between domains of CCTST, the results showed a significant positive correlation between overall domains and analysis, inference, evaluation, induction, and deduction variable at p-value < 0.01. In addition, there was a significant positive correlation between analysis, induction and deduction. Adding to that, the results revealed that there was a high correlation between induction and all domains at p-value <0.01 except with the deduction domain. Furthermore, a significant correlation between deduction and overall, analysis and inference domains has been shown at p- value <0.01. **The applications** for nursing education and clinical practices were discussed. Based on the findings, recommendations for nursing education and clinical nursing leaders were deliberated. Future

research should include a larger sample size from both genders to study more perspectives within the UAE multicultural environment.

## ملخص

أثر مناهج تعليم التمريض وإعداد القوى العاملة على التفكير الناقد والإدراك الأخلاقي والوعي الثقافي لدى طالبات التمريض في دولة الإمارات العربية المتحدة

يعد التفكير الناقد عنصراً محورياً في تطوير ممارسة التمريض الآمنة والكفوءة. ولقد أصبح خطر قرارات الممرضة غير الصحيحة على صحة المريض يشكل تهديداً كبيراً على كل من طالبات وخريجات كلية التمريض على حد سواء. حيث أن ما يقرب من نصف عدد الممرضات يتركن وظائفهن في خضم أوضاع الرعاية الصحية الحالية المعقدة ثقافياً، نتيجة لمواجهتهن المضايقات الأخلاقية والمعضلات الأدبية بشكل يومي بعد اتخاذهم الحكم السريري الخاطئ. **هدف الدراسة:** تقصي أثر مناهج تعليم التمريض وإعداد القوى العاملة على بناء مهارات التفكير الناقد والإدراك الأخلاقي والوعي الثقافي في مناهج البكالوريوس للتمريض بالإضافة إلى فحص جودة القرارات التي تأخذها طالبات التمريض في دولة الإمارات العربية المتحدة. **تصميم و منهج الدراسة:** استخدمت الباحثة دراسة استكشافية متزامنة تمزج بين آليات البحث الكمي و البحث النوعي. تم جمع البيانات الكمية من 103 مشارك من ثلاث مجموعات في دولة الإمارات العربية المتحدة و ذلك باعتماد اختبار كاليفورنيا مهارات التفكير الناقد (CCTST). كما تم استخدام الاستبيان لتقصي التفكير الناقد لدى المشاركين بالإضافة إلى قياس جودة الإدراك الأخلاقي والوعي الثقافي لديهم وتقديم النتائج التي حصلوا عليها في كل من التفسير و التحليل و الاستدلال و الشرح و التقييم. ولقد تم تحصيل البيانات النوعية عن طريق عقد مقابلات شبه منظمة لمجموعات بؤرية لتقصي تصور المشاركين لمفاهيم التفكير الناقد والإدراك الأخلاقي والوعي الثقافي ومدى استعدادهم لها. **النتائج:** أكدت الدراسة على ارتفاع مقدرة الممرضات على استخدام التفكير الناقد عندما يتم تعزيز هذه المهارة من خلال التعليم و التدريب العملي. فقد ساهم مناهج تعليم التمريض، ومكان العمل، و التعدد الثقافي و المعضلات الأخلاقية في تشكيل مهارات التفكير الناقد لدى الممرضات في دولة الإمارات العربية المتحدة وفي نفس الوقت أثرت الخبرات السريرية بشكل إيجابي على تحسين مقدرة الممرضة على اتخاذ القرار والحكم السريري. أما بالنسبة لمدى ارتباط مجالات اختبار (CCTST) ببعضها البعض، فقد كشفت النتائج عن وجود ارتباط إيجابي واضح بين مجالات الإختبار و معاملات التحليل و التفسير و التقييم و الاستدلال و التحفيز عند قيمة معامل الإرتباط  $P < 0.01$ . بالإضافة لذلك فقد سجلت النتائج ارتباطاً عالياً وواضحاً بين المجالات التحليل و الاستدلال و التحفيز. ووجد أنه هناك ارتباط إيجابي قوي بين مجال التحليل و مجال الاستدلال و التحفيز. كما وجد أن هناك ارتباط عالٍ بين مجال التحفيز و المجالات الأخرى كلها عند قيمة معامل الإرتباط  $p < 0.01$  ما عدا الإرتباط مع مجال الاستدلال. وقد دلت النتائج كذلك على وجود ارتباط عالي وواضح بين مجال الاستدلال و مجالات التحليل و التفسير بشكل عام عند قيمة معامل الإرتباط  $p < 0.01$ . لقد تم مناقشة التطبيقات المحتملة لنتائج الدراسة على كل من تعليم التمريض و التدريب العملي على حد سواء. كما أنه، و بناء على نتائج الدراسة، فقد تم الأخذ بعين الإعتبار تقديم توصيات للقادة المسؤولين عن تعليم التمريض و التمريض العملي. أما بالنسبة للأبحاث المستقبلية، فإنه من الممكن تطبيق الدراسة على عينة أكبر من المشاركين بحيث تضم كلا الجنسين لدراسة نظرتهم حول الموضوع في بيئة الثقافات المتعددة في دولة الإمارات العربية المتحدة.

## DEDICATION

First and foremost, praises and thanks to the god, the almighty for his showers of blessings throughout my research work and to complete it successfully. I don't know from where to begin with, honestly, words can't explain how thankful and lucky I am to have such a great opportunity given to me and for giving me the ambition, strength, and faith to follow my educational journey and dream.

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## LIST OF ABBREVIATIONS

CT	(Critical thinking)
MD	(Moral distress)
MR	(Moral reasoning)
UAE	(United Arab Emirates)
AANA	(American Association of Nurse Anesthetists)
CCTST	(California Critical Thinking Skills Test)
CASN	(Canadian Association of Schools of Nursing)

# Chapter 1:

## 1.1 Introduction

Critical thinking in science education has a positive influence on the students' thinking process and problem-solving abilities, an issue that has been widely discussed in the literature (Santos 2017). Today, the nursing career is considered one of the most sensitive professions that requires a variety of connected characteristics to manage nursing practices in general and guide the daily nursing skills in particular through clear ethical considerations and strong moral reasoning skills (Tsunematsu & Asai 2014). Many studies have reinforced the importance of integrating critical thinking within the science, technology, engineering and mathematics (STEM) and (non-STEM) curricula to improve the students' learning (Haynes et. al 2016). Nursing is considered to be among the most sensitive professions and one that requires a variety of competencies to guide practice in general and to direct the nurse's daily clinical decisions specifically (Mallah et al. 2018). The nursing profession relies upon solid critical thinking abilities (Faheem et al. 2018; Jeffreys & Zoucha 2017) combined with resilient ethical and moral reasoning skills (Tsunematsu & Asai 2014). Failing to display these attributes may negatively influence the nurses' care decisions for their patients and community health, resulting in evolving moral distress and ethical dilemmas that would lead almost half of them to quit their career early (Burkhardt & Nathaniel 2014; Atchison 2016).

Therefore, to enhance the nurses' clinical decision taking ability and to ensure safe practices in the current complex bedside care settings, more attention must be paid to the critical thinking and moral reasoning skills among nurses and nursing students (Eyikara & Baykara 2017; Jeffreys & Zoucha 2017). According to Lee et al. (2016) and Omer (2016), nursing students with good critical thinking and moral reasoning skills had better clinical judgments to promote their patients' safety. Additionally, Santos (2017) and Akman & Alagöz (2018) emphasized the need for continuous monitoring and evaluation of these skills to be able to correspond with the contemporary educational cognitive trends that significantly highlight critical and creative thinking besides a problem-solving based learning approach.

Currently, nurses are playing a significant and essential role in contemporary health care systems (Guo et al. 2018; Mallah et al. 2018). Modern nurses need to develop their professional identity to thrive in their careers (Guo et al. 2018). Nurses can hold very important positions at their hospitals, and they need to develop their skills continuously to improve their working status into progressive working positions. Consequently, the nursing profession starts with direct patients care and may end at higher managerial positions. The nurses can hold many advanced positions such as departmental heads, supervisors, coordinators, and hospital managers and directors. The nursing career is acknowledged as being varied in terms of its responsibilities and skills (Akman & Alagöz 2018). The American Nursing Association defined nursing based on the nurses' working tasks at the health care systems (ANA 2009). Nurses work as protectors, promoters, and optimizers of health and abilities, as well as being preventers of disease and harm, facilitators of curing, relievers of pain through the correct diagnosis and the quick response to therapeutic interventions. Moreover, Nurses are also advocates for the 'patient, family, groups, societies' and the whole population in general (ANA 2009; Mallah et al. 2018).

Originally, the nursing practice is recognized as planned training to the nurses on many essential skills and practices to enable them to provide their patients with the best care at the primary, secondary and tertiary levels (Cowin & Johnson 2011; Johnson, Green & Maben 2014). Nursing training was undertaken without focusing on the nurses' professional identity, professional self-actualization and professional fulfillment (Mallah et al. 2018). Many research studies emphasized the importance of establishing a research workforce in every modern nursing setting and nursing university. Besides, they recommended nursing educational organizations to restudy the current higher education policies to develop professional nurses rather than traditionally skilled nurses. Scholars stated that many nurses in the nursing profession have chosen the nursing career for financial reasons to find jobs easily after graduation, instead of any further personal or professional identity satisfactions (Mallah et al. 2018).

All levels of education are concerned about empowering their students with critical thinking skills (Michael & Marshall 2018; Susan et al. 2017) and moral reasoning abilities. Empowering the student's critical thinking will help them develop cognitively and morally to enable them to think analytically and behave ethically. In the distant past, many researchers in the educational field investigated critical thinking and moral reasoning separately. These efforts did not focus on

studying the effective association of each one with the other. Neither did they investigate the relationship between the two. Consequently, the researchers have found that there is a clear link between the two abilities and studying this association has become their passion (Doherty & Corsini's 1976; Fenton 1976; Fasko 1994; Weinstein 1988). Fasko (1994) came up with an innovative title for his study in which he combined the two: 'Critical Thinking and Moral Reasoning: can you have one without the other?' to clear out the current concern and discover that missing relation in more depth.

The 'clinical reasoning skills' are based on the students' progressive critical thinking abilities to deal wisely with the complexity of the healthcare settings (Kaddoura 2017). For instance, Kaddoura (2017) stated, "education is a source of improving both critical thinking and moral reasoning skills. It would seem that being able to think critically and behave ethically are important initiatives in schools" (p.12). This finding supports a previous study, which argued "persons who think at a higher moral level reason better and act following their judgment more frequently than less developed thinkers."(Fenton 1976, p.191). While other researchers who focused on children to find out this relation, they specified that children understand that every ethical behaviors must have reasons. They have suggested a method called "Ethical Inquiry" to facilitate this learning and relationship. In a sense, it has been pointed out that "ethical reasoning" is logically valid moral reasoning" (Weinstein 1988). Consequently, a great change has been signaled within educational systems to allow that moral education curriculum models are important in the educational process based on the abovementioned literature ( Fasko 1994). However, registered nurses at the health care systems are in need of critical thinking capabilities to develop their clinical reasoning and clinical judgment skills. Clinical judgment skills will allow the nurses to understand their patients' needs more intensely through logical and analytical cognitive processes (Levett & Hoffman 2013; Tanner 2006).

Clinical judgment is defined as 'an interpretation or conclusion about a patient's needs, concerns, or health or the decision to take action or not, use or modify standard approaches, or improvise new ones as deemed appropriate by the patient's response' (Tanner 2006, p.204). Simmons (2010, p.1155) further defined clinical reasoning as "a complex cognitive process that uses formal and informal thinking strategies to gather and analyze patient information, evaluate the significance of this information and weigh alternative actions". The nurses need to analyze

their patients collected data to evaluate the information then apply the desired standards to make predictions and transform this into knowledge (Pe´rez et al. 2015). This analytical process will lead to nurses applying effective, safe and professional care to their patients. On the other hand, the nurses will be more confident, creative, flexible, and open-minded as well as having a very high level of intellectual integrity. The nurses will go through a metacognitive cycle process to apply their critical thinking skills combined with their knowledge and clinical experiences to resolve any clinical issue to come up with a professional and reasonable clinical judgment (Susan et al. 2017).

Kabeel & Eisa (2016, p.100) have recommended that “nurse-educators must understand and integrate students’ learning approaches into nursing curricula to promote critical thinking and satisfying learning experiences, adopt creative approaches to transform students into interactive participants and open their minds and broaden and stimulate higher-level thinking and problem-solving abilities. In the same vein, Menezes and colleagues (2015) declared that many nursing researchers specified that there are challenges for developing a motivated supportive teaching curriculum that can enhance the critical thinking skills, and develop the clinical reasoning skills among undergraduate nurses. The main challenge was to keep a constant relationship between the designed curriculum and the updated strategies in the clinical nursing field. Consequently, Mahmoud & Mohamed (2017) have shown that there is an urgent call from the current healthcare setting leaders to prepare the new nursing generations with high-quality standards. Besides, healthcare professionals need to ensure their professionalism at work and advance their clinical judgments to conduct respectable practices that can promote their patients’ safety (Akman & Alagöz 2018; Lee et al. 2016; Omer 2016; Eyikara & Baykara 2017; Jeffreys & Zoucha 2017).

The complexity of innovative healthcare systems derives from many challenging factors. Like the contentious upgrading of the technologies used, changes in healthcare policies with challenging updating to the basic knowledge and quality of care. Alongside this, other common complicated challenges have been raised from the recent changes in demographics the societies. Generally, the world's multicultural communities are growing fast with higher rates in the UAE specifically. More on UAE nursing education status, the development of a culturally competent healthcare network and using a clear framework for guidance to produce competent and professional nurses is very necessary. A research study designed a key strategic plan to follow when nurses need to

apply culturally competent care to their patients. The strategic plan focused on five main areas: ‘demographics, language, employees, training, and communication’. The healthcare teams, stakeholders and the senior management at the hospitals approved this (Eric, Lynn & James 2010). Evidence-based practices prove that cultural competency is important for delivering high-quality patient care. Consequently, it is defined as ‘the ability of systems to provide care to patients with diverse values, beliefs, and behaviors, including tailoring the delivery of care to meet patients’ social, cultural and linguistic needs’ (Betancourt et al. 2003; Eric, Lynn & James 2010). Patient care through understanding the patient’s culture leads the nurses to achieve positive treatment outcomes with safe, effective and efficient patient care (Bakar 2018; Mitchell 2017; Mareno 2011; Esposito 2013; Truong 2017).

## **1.2 Background of the Research**

Critical thinking in science education has a positive influence on the students’ thinking process and problem-solving abilities, an issue that has been widely discussed in the literature (Santos 2017). Today, the nursing career is giving a great value to ethical considerations to build strong moral reasoning skills (Tsunematsu & Asai 2014), and reinforced the importance of enrolling critical thinking within the curriculums (Haynes et. al 2016).

Kabeel & Eisa (2016, p.100) have recommended that “Nurse-educators must understand and integrate students’ learning approaches into nursing curricula to promote critical thinking and satisfying learning experiences, adopt creative approaches to transform students into interactive participants and open their minds and broaden and stimulate higher-level thinking and problem-solving abilities”. Zoboli & Schweitzer (2013) have argued that the practices of both nurses and the other healthcare providers could be investigated through following the guidance and regulations of moral sensitivity in the workplace. A key component of the mission of the health workforce is to build up trusting relationships with their patients. That has been proven to be achievable through competent nurses who apply moral reasoning and advocate the best care practices for their patients (Hamric, Arras & Mohrmann, 2015; Johnstone 2010; Kirk 2005; Kyriacos 1995; Park et al. 2012). Therefore, the more early preparations occur at the nursing colleges, the better critical thinking skills the students will have at the workplace. According to Eyikara & Baykara (2017, p1), “Nursing students who take part in education programs involving

simulations make fewer medical mistakes in clinical settings and can better develop their critical thinking and clinical decision-making skills”. Moreover, critical thinking skills among the nurses have become another essential element for safe nursing practices in the current complex environments that involve the patients’ bedside care (Kaddoura, Van Dyke & Yang 2017).

Currently, all healthcare systems are relying on the nurses to run and manage most of the vital managerial tasks and critical positions in their clinical settings (Guo et al. 2018; Mallah et al. 2018). Accordingly, the nurses worked on their professional identity by improving their hand skills and developing their managerial skills at the same time to be able to run their departments smoothly and professionally (Guo et al. 2018). The traditional nursing career starts from simple direct patient care where the nurses learn how to provide the initial care to the patient, and can extend to higher professional specialties. They collaborate with the doctors to decide the best treatment for their patients and share the final clinical decision within very high managerial positions (Mboineki, Chen, Gerald & Boateng 2019). Therefore, nurses need to develop their management skills side by side with their nursing primary skills. Nurses hold diverse managerial responsibilities starting from team leader and progressing to in-charge nurse, supervisor, and coordinator. Nevertheless, nurses can move on and hold many higher managerial positions as department heads, hospital managers, chief hospital officers with various skills and vital responsibilities (Mallah et al. 2018).

The United Arab Emirates (UAE) has a unique challenging cultural and linguistic context that has emerged from a variety of different cultures other than the local one (El Amouri & O’Neill 2014). Accordingly, the healthcare providers in general and nurses, in particular, have been forced to work on their cultural knowledge for a better understanding of the others and to be able to provide the proper cultural care. Besides that, to improve the nurse’s attention to their patients’ needs they have to base their care on the patient’s norms, values and beliefs. The nurse’s cultural competencies and preparation for caring for a culturally diverse population are also considered a major aspect of their profession (Wood 2013; El Amouri & O’Neill 2014). Therefore, traditional nursing care alone is no longer adequate to prepare the nurses for meeting today’s patients with many complicated diagnoses at modern hospitals. Instead, nurses need to be equipped with further critical abilities, knowledge, and clinical nursing hand skills with up-to-date technological aids to assist patients with multiple complicated diagnoses (Wood 2013). In addition, the patients’ diverse ethical–cultural background adds an extra level of complexity to the nurse’s role within a

challenging hospital environment that requires them to think critically and promptly about their daily practices. For that, it is the responsibility of the nursing education leaders to produce outstanding nursing students and build up their competencies through several innovative teaching strategies (Lee et al. 2016).

Globally, there is a huge adjustment at the country's economic strategic plans towards the 'knowledge-based economy'. That reform has extended to touch most of the Gulf Cooperation Council (GCC) countries' educational systems besides the United Arab Emirates' (UAE). That change has been clearly demonstrated and disseminated via the UAE 2021 mission and vision(UAE Vision 2021). Correspondingly, the UAE government announced that science and research would be their highest priorities as productivity resources along with technology, innovation, and business for the new image of the country (Ahmed & Alfaki 2015; UAE Vision 2021).

Based on the UAE's innovative vision, the country's leaders directed their educational systems to work on reforming the current curricula based on the new updates. Respectively, a massive investments and financial strategic plan has been created to adopt the new change in UAE education systems (Ahmed & Alfaki 2015). The new national education strategic plans directed the educational organizations' goals to reform the traditional teaching methods towards innovative and solid pedagogies. In addition, they emphasized ensuring that all teachers are fully oriented and trained to apply the new teaching methods. A smooth transitional phase is required to guarantee consistency between teaching and learning at the beginning of the new systems (AlSawaleh et al. 2017).

El Sayary, Forawi & Mansour (2015) declared that this generation of students should be competent in critical thinking and problem-solving skills. Besides, they stressed the need for the educational systems to work on finding ways to implement critical thinking at the schools. Moreover, the students should be equipped with firm critical reflections and communication skills in 'STEM education and problem-based learning' as a vital asset of learning to cope with this challenging time. In comparison, Hall et al. (2011) found that there is no clear picture of how STEM education should be until now. For instance, STEM education is targeting the best concepts in life socially, economically and in terms of healthy lifestyles for everyone in society. A research

study in Saudi Arabia, aimed to develop the scholar's understanding of how to implement STEM education at their schools (Bell 2016) curricula and unifying clear and effective teaching methods. Madani & Forawi (2019) declared that the main reason behind the late implementation and the late spread of the STEM education in Saudi Arabia was the lack of knowledge and experience on how to implement and apply the STEM education instructional strategies to resolve real world problems. The study aimed to shape up the teaching practices through one clear instructional framework that can help in implementing STEM education in Saudi schools. The study focused on two main subjects, math and science, to build up their framework as a first step towards implementing that framework for the other STEM subjects in the future. The study focused on the teacher's impression of the math and science subject as expert facilitators to simplify the implementations of the results.

Many inspiring results came out from the above study that highlight the following. First, the role of the teachers should be transformed from being 'transmitters of information' to be 'facilitators of learning' to achieve effective implementation of STEM education. Then, work should be undertaken motivate the students to put more effort into discovering and researching knowledge from relevant and trustable resources during their study. After that, the next step is developing the STEM teacher's abilities and teaching skills and competencies through a motivated school's environment. Next, the teacher's professional development activities should be planned supported and arranged by the school's management administrators. Besides this, it is vital to support the new instructional approaches with all of the necessary tools to build up a solid STEM education structure to accomplish the current innovative approach. School management should provide the teachers with full encouragement and inspiration for applying the new strategies all the time. Finally, excellent support from the Ministry of Education is essential to increase both the teachers' and the students' exposure time to STEM education (Madani & Forawi 2019).

Symmetrically, another leading call affected the UAE higher education system to reform the current educational system at their universities based on the updated vision of the government to match with the same call in schools (UAE Vision 2021). The UAE health care system raised its need to hire highly qualified nurses who can deal with future innovations at the hospitals. Internationally, the complexity of the hospitals came out from many unstable influencing factors. Mastering the challenging work environment based on technological innovation and lacking

critical problem-solving skills became the main requirement for professional nursing graduates. The expectations of the coming generation of nursing graduates should be that they are highly capable with solid clinical judgment skills. The nurse's clinical judgments rely on many competencies; professionally, ethically, morally, culturally sensitive, their decisions are based on their critical thinking and problem-solving skills at the workplace (El Amouri & O'Neill 2014). Studies showed that there would be a significant need for professional nurses to cover the expected nursing shortage within the coming years. Around 50% of nurses leave the nursing career and quit direct patient care to avoid a challenging work environment and evade the expected ethical and moral dilemmas (Akman & Alagöz 2018; Burkhardt & Nathaniel 2014; Ulrich et al. 2010; Zoboli & Schweitzer 2013; Jeffreys & Zoucha 2017).

Allen & Knibbs (2015) mentioned that one of the UAE's strategic goals is to focus on research, with a high investment planned budget that was to invest 6 billion UAE dirhams on research (UAE Vision 2021). Many studies showed that there is a significant gap between the student's background knowledge at their primary and secondary schools and their knowledge at the universities. The high expectations of their universities used to lead the students to quit their studies (Hvidt, 2016). Abu Dhabi Education Council (ADEC) has announced that they are committed to providing the UAE society with highly qualified citizens who are fully equipped with standardized and advanced competencies before joining their universities. ADEC's latest strategic plan declared that its main purpose is to enable the UAE students with the required competencies in knowledge and social skills (ADEC 2019).

The UAE government's National Strategy for Higher Education (2030) is the distinguishing importance of higher education institutions in developing the country economically and socially. For that, UAE higher education aimed to compete with the world's top educational institutions in innovative educational systems and improving the student's skills to meet the future needs of the country. Therefore, ADEC supported research in higher education in many aspects. Recently, they announced a huge grant investment for outstanding research in UAE with international standards. ADEC (2019) detailed that, "The Abu Dhabi Award for Research Excellence (AARE)-2019 is a competitive funding program for outstanding research proposals in targeted areas within Abu Dhabi. Research funded by the AARE program is expected to advance scientific and technological development within the Emirate of Abu Dhabi, as well as develop meaningful partnerships

between Abu Dhabi scientists and leading academic and industrial collaborators, both nationally and worldwide.” Accordingly, to achieve the government vision the grant was distributed on information and communication technology (ICT), manufacturing, aerospace, energy, environment, health, food, and agriculture with AED 1,000,000 each while education and social sciences have AED 300,000 alone (ADEC 2019).

The UAE has targeted innovation in nursing and health education for the Higher Education National Strategy 2030 that has created several questions: Does the UAE nursing curriculum develop the nursing students’ critical thinking skills to accommodate the expected innovation challenges? How can we attract the nursing students to continue in the nursing profession to avoid the predicted nursing shortage? Are we helping UAE society by generating nursing graduates with good clinical judgment skills morally and ethically? What are the changes that we need to develop an innovative curriculum up to the targeted international standards? What is the impact of the workforce on our students’ preparation to enhance their professional development?

### **1.3 Statement of the Problem**

Due to the importance of critical thinking and moral reasoning skills among healthcare professionals at the current complex bedside care settings, many researchers aimed to study how to develop the nurses’ skills (Eyikara & Baykara 2017; Jeffreys & Zoucha 2017). Nursing students having better critical thinking skills, will ensure their professionalism at work and enable them to have advance clinical judgments to promote their patients’ safety (Lee et al. 2016; Omer 2016). Naturally, students have different abilities in thinking, memorizing, reasoning and even individually processing information that should be evaluated and improved by the students’ instructors (Santos 2017). Kabeel & Eisa (2016, p.100) found that “There was evidence of a positive correlation between learning approaches and critical thinking among baccalaureate nursing students. Therefore, ‘Assessment for learning approaches and critical thinking are necessary for teachers to truly determine if these skills are present and how some of them need to be developed when facilitating” .

Educators today are adopting critical-creative thinking and problem solving teaching based on the cognitive approach, away from the classical memorization (Akman & Alagöz 2018). Earlier, Young & Fry (2008) have supported the move from the conventional teacher-centered teaching

and rote learning - which is based on the behavioral approach to the student-centered learning that is based on the cognitive approach of inquiry. In other words, the students' own understanding or learning process will be developed by their own critical examination of the given findings and pieces of evidence (Chen & Tseng 2017). A study has been done in Turkey to investigate the relationship between metacognitive awareness and participation in class discussion of university students. They found that the critical thinking skills would enable the students to develop their problem-solving skills, which will lead them to improve their quality of life through thought sharing, discussion, and book readings. Therefore, the students' vocabulary increased significantly and helped them to express their own thoughts fluently and clearly in various platform discussions at the university (Akman & Alagöz 2018).

The recent healthcare systems recommended their need for professionally advanced and safe registered nurses (Chulach & Gagnon 2016). This recommendation was joined with another recommendation to the educational leaders to produce highly qualified and advanced nursing graduates to adapt to innovations in the healthcare field (Chulach & Gagnon 2016). The traditional nursing graduates will not be able to persist and cope with the new challenges and complex demands of the future healthcare field unless they are fully equipped with certain skills and prepared with advanced intrapersonal abilities. Nurses cannot isolate themselves away from the other healthcare professions' at the healthcare systems, as they have to interact with a complicated multicultural context (Chulach & Gagnon 2016; Johnson, Green & Maben 2014) Many studies found that UAE students are not thinking critically and lack reasoning and problem-solving skills in general. While others confirmed that UAE students focus more on their memorization skills (Scott 2008; Forawi & Mitchell 2012; Sabri & Forawi 2017). Further, the researchers announced that it is very important to motivate the UAE teachers to develop new teaching strategies to stimulate their student's critical thinking. However, the teachers should promote their teaching skills, to enable the students to utilize their critical thinking skills successfully. Also, the teachers should advance their professional development and teaching strategies to apply critical thinking and promote the moral reasoning teaching skills of their students. Moreover, UAE teachers should reform their curriculum to identify the critical thinking curriculum features. This is besides implementing new, effective teaching strategies to enhance problem-solving skills as an integral part of learning outcomes of the UAE students. Finally, the studies point out the importance of

testing the students' critical thinking abilities before and after conducting the professional development sessions for the teachers (Sabri & Forawi 2017).

In recent times, the main objective of higher education in many countries focused on evaluating the undergraduate student's critical thinking skills at their universities (Thiebach, & Jucks 2016). In addition to this, developing the undergraduate student's critical thinking skills became an essential responsibility and significant goal of every faculty at the universities. For instance, a study found that around 90% of the teaching faculties agreed on the fact that critical thinking skills have become the most significant experience of their undergraduate students, and are very important for their future development (Grant & Smith 2018).

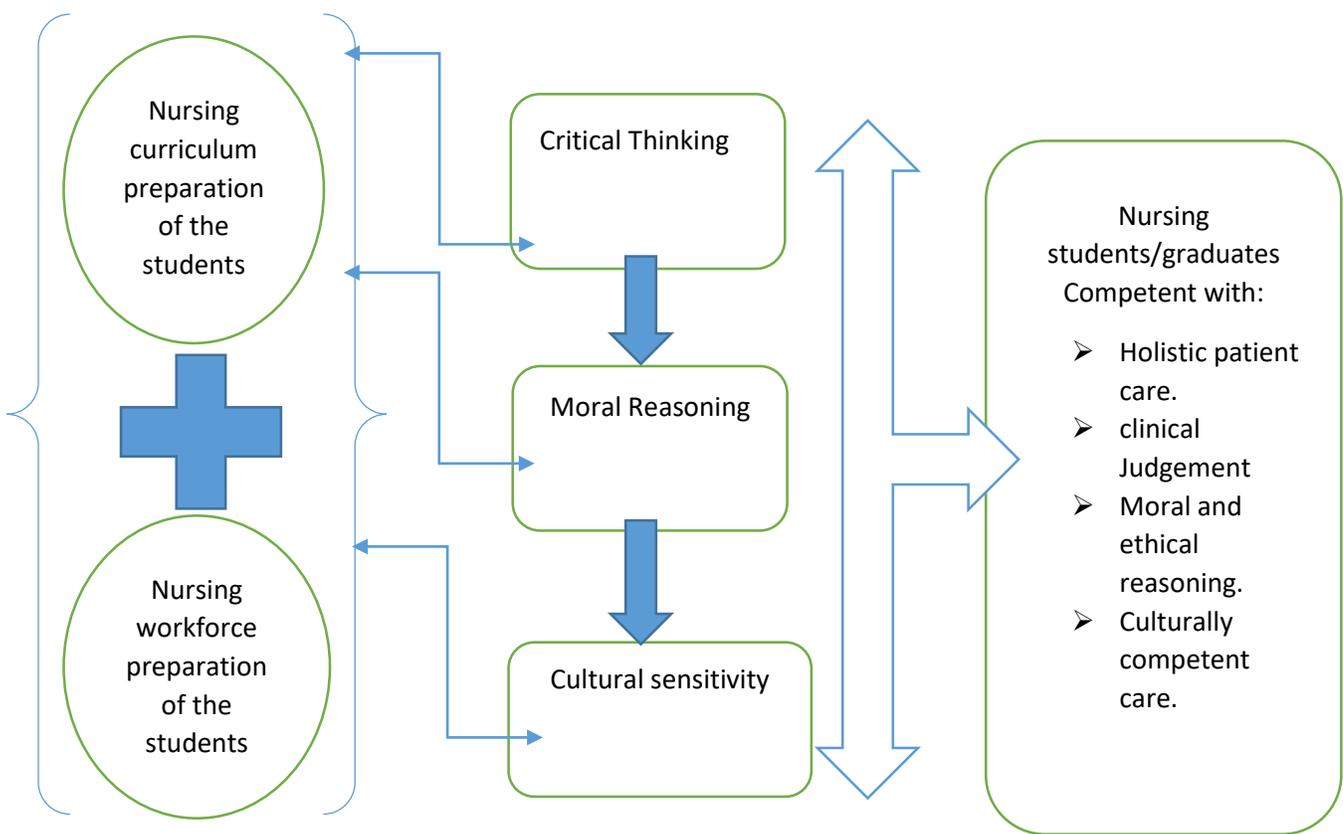
Having culturally competent health care providers has also become a major need and a core constituent of any healthcare curriculum in most of the health sciences academic institutions. Students need to be followed up and guided by expert instructors in the field to develop their communication skills and improve their understanding of other individuals in the multicultural communities (Gözüm, Tuzcu & Kirca 2015). The world population context is changing very fast, the US is expected to have 50% of their future population structured with different ethnic and racial routes in 2060. This expectation has forecasted critical future that in turn has elevated the need for culturally competent healthcare providers (U.S. Census Bureau 2012). Accordingly, the future racially diverse patients need to have advanced culturally sensitive, safe and open-minded healthcare communicators (Fleming et.al 2015). Therefore, many researchers have called for urgent further investigations to deliver culturally congruent care for all multinational and multicultural individuals (Jeffreys & Zoucha 2017).

Abu Bakar et al (2017) conducted an observational cross-sectional study that aimed to explain the relationship between the spirituality of the nurses and their caring behavior. Consecutively, 88 nurses were recruited (16 males and 72 females) as a satisfactory sample number of participants from the ward nurses in three different hospitals in December 2016. The three hospitals were Haji Hospital Surabaya, Al Irsyad General Hospital Surabaya, and Muhammadiyah General Hospital in the Gresik district of Indonesia. Primary data were collected using questionnaires on the nurses' caring behaviors and spirituality. Their caring behavior was recognized in terms of respect, positive relations, skills, and knowledge while they were taking care of their patients. The study results showed that the nurses' working experience and their educational level had no significant

effect on their spirituality and caring behavior. However, the study found a positive association between the spirituality of the nurses and their caring behavior that can improve nursing practices. The study recommended further research specifically on Islamic caring interventions. Accordingly, the current study investigates the students' preparedness to understand the UAE Islamic culture and provide culturally competent nursing care with critical thinking and problem solving skills.

#### 1.4 Purpose and Questions

The main purpose of this concurrent mixed study is to investigate the impact of the nursing education curriculum and workforce preparation on students' critical thinking (CT) and moral reasoning (MR) skills within the BSc nursing curriculum and examine the quality of critical thinking and moral reasoning among the UAE nursing students within culturally competent care. The conceptual framework of the study presented the association between the study used concepts. These chosen concepts have been presented in the below conceptual framework in Figure.1.



**Figure 1** Conceptual framework

The study will aim to answer the two proposed research questions.

Research study questions:

How were the nurses and the nursing students ready to cope with the clinical decision-making based on exploring their critical thinking and moral reasoning skills within the cultural sensitivity environment in UAE?

1. What impact does the nursing education curriculum have on three different nursing cohorts (undergraduate students, internship, and graduate) in terms of critical thinking, moral reasoning, and in the UAE?
2. What influence, if any, does the workplace preparation have on the three different nursing cohorts' practices concerning critical thinking, moral reasoning, and cultural sensitivity in the UAE?

## **1.5 Rationale**

Critical thinking is an essential constituent in nursing education and believed to be necessary by various nursing school accrediting bodies and research studies (AANA2017 b; Butin 2015; Escolar & Chua 2016). The Canadian Association of Schools of Nursing (CASN 2011, p.1) acknowledged, "Baccalaureate programs provide the foundation for sound clinical reasoning and clinical judgment, critical thinking, and a strong ethical comportment in nursing". Accordingly, moral distress and critical thinking have become common topics within the nursing education curricula and have mandated the nursing education leaders to protect their students from any expected danger in clinical settings (Atchison 2016).

As stated in '8th edition of the SEHA International Nurses, Midwifery and Allied Health Conference, SINMAC' (2019) Abu Dhabi, the healthcare system should be developed to assure the optimal health of the patients and the healthcare staff through proper utilization of the national and international technological innovations. Accordingly, 'Improving Health Outcomes through Artificial Intelligence, Innovative Work Environment and Staff Well-being' was the main theme

of the conference. Moreover, the conference aimed to gather all the national and international nursing and allied health education experts to discuss the current issues in health education and to exchange their knowledge and experiences with the UAE health and nursing educational leaders. The focus was on implementing the recent global educational innovations to bridge the local gaps in the UAE healthcare educational systems (SINMAC' 2019).

It is anticipated that this proposed study will provide further guidance to the UAE nursing educational leaders to reform the existing nursing educational curriculum. In addition, the UAE multicultural environment stimulated the nursing education programs to reconsider their educational objectives and encourage their faculties to evaluate and assess the nursing students' critical thinking abilities to adapt to the expected innovations in the nursing field (Abu Hantash & Van Belkum 2016; Brownie et al. 2015; Wollin and Fairweather 2012). This would in turn develop interactive, open-minded participants who would stimulate higher-level thinking and problem-solving abilities that would produce morally and culturally sensitive nursing clinical judgments. Finally, from the above, the researcher found that many studies have investigated the relationship between two of the three competencies, CT and MR, and culturally competent care. However, there were no studies found that investigated the relationship between the students' preparations of all three combined competencies, critical thinking, moral reasoning, and cultural sensitivity. However, there were many recommendations and calls to reform the nursing education curriculum based on developing the three competencies. To fill this gap in the literature and to meet the needs of the multicultural and multiethnic UAE community, and to reform the nursing education curriculum accordingly, the study will investigate the three competencies together to support the purpose and research questions of the study.

From my current close observation and my long experience in the nursing educational field as being a nursing manager, senior lecturer, program counselor and an academic advisor for the last 23 years. Over these years, I have witnessed all the reforming modifications to the nursing curriculum in the UAE. The UAE nursing program developed from graduating the students with higher diploma in nursing until it reached to the Bachelor of Science in Nursing Degree (BSN) in nursing with affiliations to international universities. I anticipated lots of personal anecdotes from the Emirati female students, as they are known for their open nature. Not only are they willing to talk and express their feelings, but also they elaborate and about their personal experiences. This

exposed and free characteristic about the Emirati females is not a new thing as they used to express their emotions to their teachers during the collage teaching, academic consultation and advising time in regular bases.

## **1.6 Significance and relevance of the Study**

The danger of incorrect nurse's decisions on the patient's health has become a major threat for both the nurses at the profession and the nursing students (Atchison 2016). Almost half of the nurses leave their career in health care settings as a result of facing professional and moral distress through ethical dilemmas after making incorrect decisions that affect their patients' health (Burkhardt & Nathaniel 2014; Atchison 2016). Burkhardt & Nathaniel (2014) have found that the world is losing between 30%-50% of their professional nurses at health care facilities as a result of moral distress which they go through whenever they are confronted with ethical dilemmas with their patients' and their families. The nurses' resignation decision after insufficient years of experience has two main reasons. First, they need to quit from their complicated and challenging professional career and rest after a few years. Second, the decision comes if they fail to change from the bedside direct patient care setting to other alternative settings with fewer confrontations. Juraschek et al. (2012) has discussed the global huge demand for a large number of nurses at the hospitals after the expected extreme shortage (Robinson & Niemer 2010; Atchison 2016). Shelton (2012) has also announced that the expected nursing shortage in 2030 will be huge and critical in the nursing field. Correspondingly, others found that more than one million nurses are needed in 2024 (American Association of Colleges of Nursing 2017 b; Bureau of Labor Statistics 2015).

Nursing education is facing a great challenge in integrating the critical thinking and moral reasoning skills into the traditional nursing curriculum. The call for this integration came as a result of the strong belief that the impact of the moral and ethical sensitivity on the nurse's professional growth and maturity in decision making is significant (Tsunematsu & Asai 2014; Zoboli & Schweitzer 2013). Moral judgment and emotional social intelligence during patients' care have been found to be an important criterion for healthcare professions such as nursing, general health sciences, and physical therapy programs. In addition, they help to improve the students' academic knowledge and clinical skills (Larin et al. 2014). The patient-nurse relationship is a key element

within the nursing care practices and is based on the effective critical moral and ethical decisions (Johnstone 2010; Kyriacos 1995; Kirk 2005; Park et al. 2012; Hamric, Arras & Mohrmann 2015).

Consequently, moral judgment and emotional social intelligence have been found to be important standards of the nursing profession that have influenced the nursing shortage globally. Juraschek et al. (2012, p. 245) have highlighted that “Kentucky’s registered nurse shortage is estimated to increase to approximately 3,244 open positions by 2030”. Similarly, the ‘National Council of State Boards of Nursing and the Forum of State Nursing Workforce Centers’ (2013) stated that “there will be 1.05 million open nursing positions by 2022”. Researchers were able to put further recommendations to the nursing education leaders to “have a clear understanding of the variables associated with student attrition” (Peterson-Graziose, Bryer & Nikolaidou 2013, p. 353). One of these recommendations was put forward by ‘The American Nursing Association’ which stressed that all the new graduate nurses who had the ‘licensed registered nurse’ (RN) qualification should be professionally well prepared through clear understanding of the common code of ethics (ANA 2015). These factors have pushed the nursing educational leaders’ to think more deeply about the nursing shortage over the coming years and consider the need to have new strategies that can attract more students to this highly demanded major and to maximize the chances of their retention. Therefore, the nursing educational leaders over the past few years became more dedicated to assure their societies that the nursing curriculum is eligible to produce the best expected educational outcomes for their nursing students (Nardi & Gyrko 2013). Thus, massive curriculum preparations and reforms have been followed to ensure nursing graduates who can promote patient safety and are up to the anticipated standards (Atchison 2016; Bindon 2017).

At the same time, the UAE educational developed very rapidly with the country’s economic development that added prodigious benefits to the students at different levels. The UAE Ministry of Education Strategic Plan (2017-2021) aimed to “Develop an innovative Education System for a knowledge and global competitive society , that includes all age groups to meet future labor market demand, by ensuring quality of the ministry of education outputs, and provision of best services for internal and external customers” (Ministry of Education 2019). From this point onwards, the UAE educational authoritative leaders as the Knowledge and Human Development Authority (KHDA) and Abu Dhabi Education Council (ADEC) shaped their strategic plans to

focus on developing the UAE student's critical thinking and problem-solving skills in education. The UAE educational context has been nurtured with innovation in curriculum and methodology (Forawi 2016). The UAE curriculum students are more involved in real-life experiences to solve real problems, to develop their critical thinking skills and solve issues that are more complicated in their future context (Getting 2017). Moreover, the new curriculum is motivating the students' cognitive skills by encouraging them to reflect, communicate and collaborate when solving complicated problems to develop self-direction (AlSawaleh, et al. 2017; Forawi 2016; Getting 2017; Gross 2016; Taylor 2016). Nevertheless, the researchers justified that the more the students were involved in critical thinking and the problem-solving situation during their education, the more they are culturally sensitive with better moral and ethical understanding within their community (Taylor 2016).

### **1.7 Definition of Terms**

To offer additional clarity, this section includes the definitions of curriculum, code of ethics, moral development, moral distress, Bachelor of Science in Nursing Degree, competent nurses, culture, clinical judgment and critical thinking that the researcher used for this study.

**Curriculum** was defined as “philosophical approaches, curriculum outcome statements, (the) overall design, courses, teaching-learning strategies, delivery methods, interactions, learning climate, evaluation methods, curriculum policies, and resources” (Iwasiw, Goldenberg & Andrusyszyn 2009, p. 5). Curriculum was also defined as relevant to any context as “context-relevant curriculum responsive to learners, current and projected societal, health, and community situations, and current and projected imperatives of the nursing profession, consistent with the mission, philosophy, and goals of the educational institution and school of nursing, and community” (Iwasiw & Goldenberg 2015, p. 7).

**Code of Ethics:** “non-negotiable standards, values, obligations and duties of the individual nurse and the nursing profession at large” (ANA 2015 p. 8).

**Moral development:** “The growth in an individual's social values concerned with human cooperation, adjudicating conflicts among individual interests” (Rest et al. 1986, p. 3).

**Moral reasoning:** “Moral reasoning is the process of determining right or wrong in a given situation. According to the American psychologist, Lawrence Kohlberg, people develop through three levels of moral reasoning as needed by situations they encounter. The lowest level of development involves making decisions of morality by trying to avoid being punished. At the second level, a person perceives an absolute right and wrong and believes the law is the judge of morality. The highest level when make moral choices based on social contracts, or unspoken agreements to behave a certain way, and when they can generalize ethical principles beyond their own interests and not one based on simple ideas such as trying to avoid punishment.” ( Bucciarelli et al. 2008; Jameton 1993, p. 542).

**Culture:** “a system of learned behavior which was characteristic of the shared norms and values that are held by a group of individuals” (Schein 2004).

**Cultural sensitivity:** is the knowledge, awareness, and acceptance of other cultures. It includes "the willingness, ability and sensitivity required to understand people with different backgrounds", and acceptance of diversity and it "refers to being aware that cultural differences and similarities between people exist without assigning them a value" (Kubokawa 2009).

**Bachelor of Science in Nursing Degree / BSN:** “An individual can qualify to take the licensure exam to become a registered nurse by completing a Bachelor of Science degree awarding program offered at a college or university. Program length is usually about four years” (ANA 2015; All Nursing Schools 2001).

**Competent Nurses:** “competence, typified by the nurse who has been on the job in the same or similar situations two or three years, develops when the nurse begins to see his or her actions in terms of long-range goals or plans of which he or she is consciously aware” (Benner 1984, p. 25-26).

**Clinical judgment:** “noticing pertinent and non-pertinent patient cues, developing interpretations and forming hypotheses, responding through nursing action, and evaluating the actions that occurred through reflection” (Gordon et al. 1994; Regan-Kubinski 1994; Tanner 2006).

**Clinical decision-making** is a balance of known best practice (the evidence, the research), awareness of the current situation and environment, and knowledge of the patient. It is about

'joining the dots' to make an informed decision from many sources including formal education and experience gained over time in practice. Clinical decision-making can be defined as choosing between alternatives, a skill that improves as nurses gain experience, both as a nurse and in a specific specialty that requires good quality judgment including critical thinking. It is a cognitive skill of analysing, applying standards, discriminating, information seeking, logical reasoning, predicting and transforming knowledge' [Scheffer & Rubenfeld 2000, p357].

**Critical Thinking:** critical thinking is an extremely important component of the nursing curriculum (AACN 2017a; NCSBN 2014a; NLN 2013). Paul (1993, p20) defined critical thinking as “a systematic way to form and shape one’s thinking. It functions purposefully and exactly. It is thought that it is disciplined, comprehensive, based on intellectual standards, and, as a result, well-reasoned. Critical thinking is distinguishable from other thinking because the thinker is thinking with the awareness of the systematic nature of high-quality thought, and is continuously checking up on himself or herself, striving to improve quality of thinking”.

**Workforce preparation:** preparing workers with the skills necessary for a specific type of job. It prioritizes the value of ongoing workplace education and skills development, as well as addresses the hiring demands of employers (Culpepper 2003).

**Nursing curriculum:** is the learning opportunities (subject matter) and the learning activities (clinical experiences and practices) that the faculty plans and implement in various settings for particular group of students, for a specified period of time in order to attain the objectives (planning, 2020) .

In the following two major sections of the paper, the theoretical framework and the literature review will be expanded upon in detail.

## **1.8. Structure of the dissertation**

The thesis is structured into five chapters. In the first chapter, a background review of the research topic is presented with an overview of the context where the research was conducted and the nursing education and clinical in the UAE. Chapter one also deliberates the research problem, the purpose of the study, the research questions and the significance of the study.

The second chapter covers the conceptual analysis of the study. Then, the theoretical framework where she discusses the theories adopted in this study. First, 'Vygotsky's cognitive theory' for examining the students' critical thinking skills. Second, 'Moral Reasoning Theory' for examining the students' moral reasoning skills. Then, 'Leininger's Culture Care Theory' for exploring the students' cultural understanding and cultural sensitivity skills. Finally, Lovering's model of 'Crescent of Care nursing' has been specifically adapted to highlight the particular nature of the UAE Arabic- Islamic context. Then, different studies that explored the constructs of focus in this study are reviewed and the chapter conclusion.

In chapter three, the researcher clarifies the methodology followed in the study. She also discusses the research approach and paradigms used. In addition to that, the site, sampling as well as the data collection instruments including their validity and reliability, analysis procedures and ethical considerations are presented.

The fourth chapter presents the analysis of the collected quantitative and qualitative data. First the demographics statistics, then factor analysis and descriptive statistics. While the last section of the chapter covers the qualitative data analysis of each construct and the relationships between them.

In the last fifth chapter, the results of the study are discussed and answers to each research question is presented and elaborated on. The results are compared to previous studies to support or contradict them. The chapter concludes by presenting the implications and suggesting recommendations to policy makers. It also looks at the limitations of the study and provides suggestions for further research.

## **Chapter 2: Literature Review**

The main purpose of this concurrent mixed study was to investigate the impact of the nursing education curriculum and workforce preparation on students' existing critical thinking and moral reasoning skills within the BSc nursing curriculum and to examine the quality of clinical decision making among the UAE nursing students within culturally competent care. In this chapter, a comprehensive literature review was undertaken synthesized and presented pertaining to safe professional nurse preparation, standard-based nursing curriculum and reforming nursing education includes critical thinking. Moreover, this chapter includes the theoretical framework that has been constructed based on many supported theories from the researcher's knowledge of literature that is closely related to the current study.

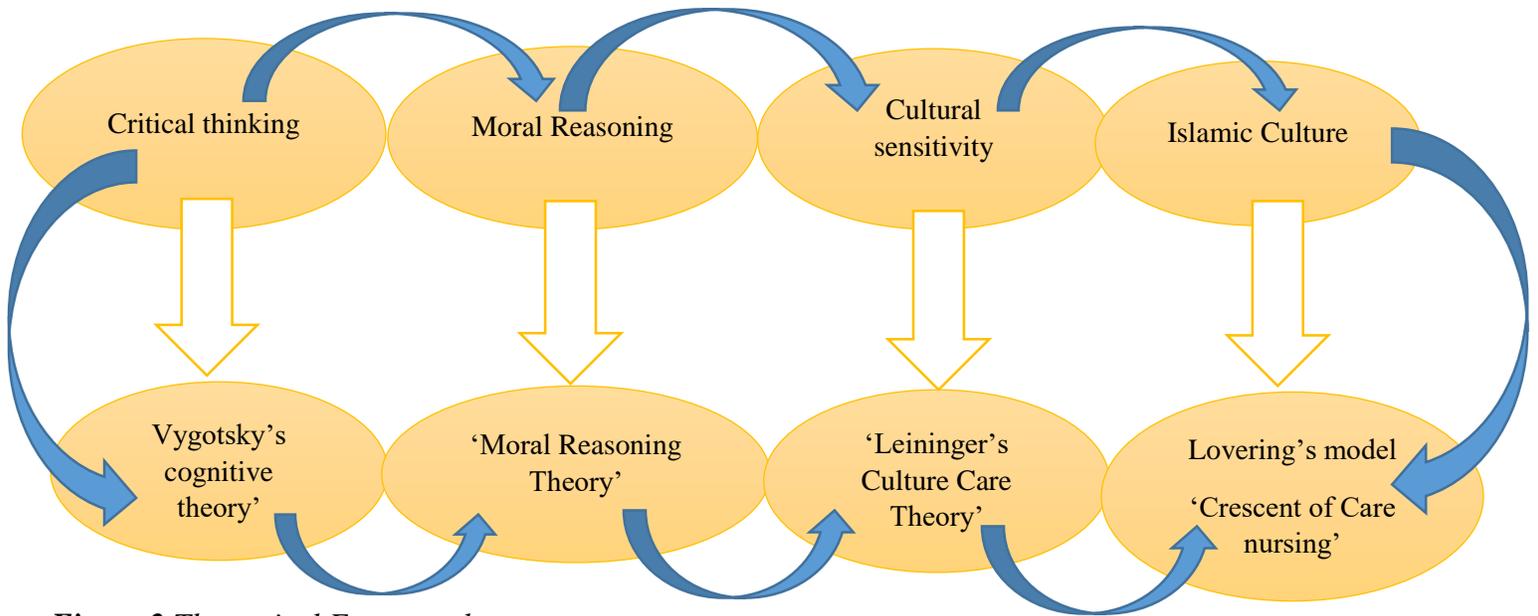
### **1. Theoretical Framework**

Different theories and frameworks exist in the literature regarding the measurement, understanding, and development of the safety and quality of nursing care that can influence the future nursing workforce. "The transition to quality and safety in the new graduate registered nurses' practice remains problematic directly impacting patient outcomes. Effective mentoring during transition serves to enhance experiential learning, allowing the development and establishment of safe, quality nursing practice. Nurse theorists play an important part in shaping nurse education and practice. Also, nurse theorists have provided nurse educators and leaders an understanding to shape skill acquisition and the transition process for new graduate registered nurses." (Murray, Sundin & Cope 2019, p.199).

The current study has investigated the impact of the nursing education curriculum and workforce preparation on the students' existing critical thinking and moral reasoning skills within the UAE BSc nursing curriculum. In addition, the study examined the quality of clinical decision making among UAE nursing students within culturally competent care. Accordingly, several

research studies that examined the relations between the current study concepts were reviewed. Furthermore, the study carried out a deep inspection of the literature that has deliberated several theories and models of the same concepts of this study. The researcher was guided by reviewing this wide range of literature in selecting and adopting the theories that were found appropriate to the intended thesis.

In this research, the theoretical framework that has been selected presented the investigations that were carried out based on three theories and one model. First, ‘Vygotsky’s cognitive theory’ for examining the students’ critical thinking skills. Second, ‘Moral Reasoning Theory’ for examining the students’ moral reasoning skills. Then, ‘Leininger’s Culture Care Theory’ for exploring the students’ cultural understanding and cultural sensitivity skills. Finally, Lovering’s model of ‘Crescent of Care nursing’ has been specifically adapted to highlight the particular nature of the UAE Arabic- Islamic context. The theoretical framework that has been selected is represented in Figure 2.



**Figure 2** Theoretical Framework

In recent times, the world became more connected with new technological methods of communication that removed previous boundaries, and this could be beneficial in addressing many

global health issues. Global health issues (GHIs) require global planning, preparation, prevention, and huge national and international cooperation to produce health equity among all nations. Everyone within the community should be capable of finding solutions for these health issues, starting from the governments, profits, nonprofits, and private institutions until we reach every individual to help in overcoming that health problem. Today, the world has become a virtual community that made the enquiry into any given health issue now has added dimensions of intercultural discourse that need to be considered (Edmonson et al. 2017; United Nations 2015; Rozendo, Salas & Cameron 2017). Social justice (Hines-Martin & Nash 2017), equity and equal distribution of both health resources and health workers will increase the health quality of any community (Edmonson et al. 2017). For instance, the Association of Public Health Nurses (2015) announced that elimination of health inequalities and achieving equity were the core responsibilities of the public healthcare nurses among diverse cultures. Over time, the researchers were expecting great global expansion in the population while they had expected another huge corresponding shortage of healthcare workers. The World Health Organization (WHO) estimated that the world would have a shortage of 12.9 million healthcare workers by 2035 (World Health Organization 2013). Meanwhile the world population of 7.3 billion is anticipated to reach 8.5 billion by 2030 and 9.7 billion by 2050 (Edmonson et al. 2017; United Nations 2015).

In reality, certifying qualified and safe healthcare professionals as well as safe nursing students were and still are major concerns for all the nursing educational institutions (Duckett & Moran 2018). Further, modifying the student's clinical and practical skills through safe transitional mentoring programs was another core concern of both educational and clinical nursing professional leaders. There is broad agreement between researchers about the direct impact of the effective monitoring and training of the new nursing graduates and the quality of their patients' health outcomes (Duckett & Moran 2018; El Haddad, Moxham & Broadbent 2017; Murray, Sundin & Cope 2019).

At Present, nurse educators should be committed to preparing a new generation that can reflect critically on the social dilemmas. Health professionals with deep critical reflection skills for identifying social inequities and health inequalities will be able to empower their community and work on promoting freedom with social justice. Additionally, deep critical reflection abilities of the individuals will foster the growth of the socioeconomic status of the whole community. This

in turn could enable individuals to access the best health resources within their society. Finally, critical thinking has helped the individuals to fight for their rights globally (Rozeno, Salas & Cameron 2017). Researchers have argued that effective monitoring has many advantages for conducting safe practices for the new healthcare professionals and empowering nurses with a good quality of healthcare experiences. Furthermore, shaping good nursing education and providing the students with safe practices within their profession will influence the nursing workforce's future positively (Murray, Sundin & Cope 2019).

Usually, healthcare professionals understand that the patient's behavior to health will vary based on their diseases, threats and other individual variations that can change their behavior (Tones & Tilford 1994). Therefore, there could be inconsistency among healthcare professionals' in evaluating and managing their patient's health status with different dilemmas. Other studies found that health management inconsistency might result from implementing the same classical social cognitive models on all patients. Thus, Lathrop (2013) argued that the social determinants of health had a deep influence on the United States population's health status. US nurses are leading the nation's health equity by taking on many critical roles as patient advocates, patient care experts and community-focused educators. Consequently, US leaders argued that their nurses could lead their national health equity and the whole nation depended on them to collaborate, educate, and advocate for the social determinants of health at all levels in their community.

Nevertheless, most patients show strong resistance to changing their health behavior unless they have strong incentives (Whitehead 2001). The applications of nursing clinical decisions may have a positive or negative impact on the patient's health that could be guided by the nurse's clinical reasoning skills and the nurse's contentious progress in clinical judgment experiences (Geist & Kahveci 2012; LaMartina & Ward-Smith 2014). The close relationship between the decision-making, clinical reasoning, and clinical judgment skills led many researchers to use to use these terms interchangeably in their arguments on nursing educations, while others used them purposefully with a clear understanding of each term individually (LaMartina & Ward-Smith 2014; Huang et al. 2016; Mahmoud & Mohamed 2017).

Health education has been grounded on many theoretical concepts that had originated from several health promotion practices. Originally, many research models were used to change people's health behaviors (Cole 1995) and to explain their actions based on the specific

psychological status of the individuals. First, the ‘social cognitive model of health-related behavioral change’ was one of the most famous models within the health context that has been associated with the cognitive process (Whitehead 2001). This model was used to understand the patient’s reactions to their health problems then analyzed their responses to the illnesses accordingly (Cole 1995; Whitehead 2001). In comparison, Bandura (1977, 1986) had previously connected the individuals ‘health-related behavioral change’ to the patient’s ‘self-efficacy’. Meanwhile, he was studying that connection to find a relationship between the two. After that, Bandura’s theory was difficult to adapt to the complexity of the healthcare field as it reflects the individual’s confidence in achieving their goals using their abilities to control ‘own motivation, behavior and social environment’. However, Bandura’s theory was used widely in many other disciplines rather than healthcare for many years (Whitehead 2001).

Usually, health professionals acquired their skills and knowledge through informative learning to produce experts in the healthcare field. Nevertheless, reforming the health education curriculum was guided by the transformative learning outcome of instructional reform. That reform moved from informative to formative to transformative learning and interdependence in education. The ‘Commission on The Education of Health Professionals’ (2010) had recommended the ‘competency-driven approaches’ to be used in instructional design for fast improvement of the healthcare professional’s competencies. In addition, competency-driven approaches need to be connected to too much global teamwork and global resources to change and strengthen local education. Therefore, reforming the health education curriculum demanded health education leaders to encourage their faculty development and promote social accountability skills in the health education system. Nevertheless, the health education experts recommended that implementing this change should be over a long time to contain the complexity and variations in the health context as well as among healthcare professionals (Commission on the education of health professionals 2010; Frenk et al. 2010).

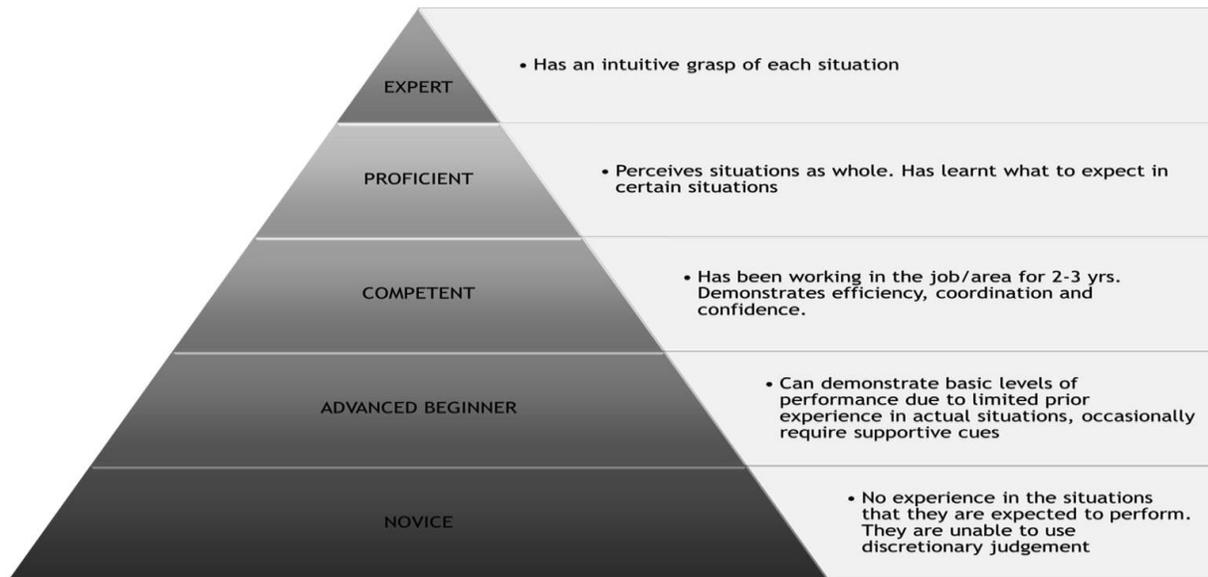
The turnover among the nursing graduates after their first year of work within the clinical fields came about mainly from the reality shock during this transitional phase. The graduate nurses moved from being dependent students to professional nurses who need to work independently and could face many difficulties in adjustment with the clinical field. For this reason, the literature highlighted the need for the critical thinking preparation and reflection preparation for the nursing

profession (Chelsea 2019). The first year of practice is full of challenging experiences for novice nurses and they need to learn how they can reflect directly on their first experiences to develop good coping skills to face their daily challenges (Caley, et al., 2017; Chelsea 2019). Recently, international researchers found that critical reflection and open discussion do not exist within the internship programs of the new nursing graduates at most of the nursing colleges. The absence of critical thinking reflections caused dissatisfaction among the fresh graduate nurses and increased their turnover after the increased stresses and the significant lack of self-confidence. The researchers have suggested the utilization of the Gibbs reflective cycle model to support the nursing graduates during their reflection on the clinical experiences during the first year. As a result, the critical thinking of the graduates improved through the implementation of 'Patricia Benner's From Novice to Expert' the theoretical framework of Gibbs cycle. In this framework, the nurses will apply many steps from 'novice, advanced beginner, competent, proficient, and expert'. Gibbs's cycle was able to support the healthcare workers' reflection discussion at the clinic for a long time. Moreover, the framework has guided the novice nurses during their transitional first stage and developed their critical thinking which has improved their reflection (Chelsea 2019).

Leistner & Carlin (2019) focused on studying the working progress of the nurses' clinical professional development. The authors used 'Benner's theoretical framework of novice to expert' as a structure for outlining their Assisted Living (AL) nurse competencies framework with its five stages: 'novice, advanced beginner, competent, proficient and expert'. The study was following-up the nurses' work progress in the nursing field starting from being a novice nurse until they reached an advanced stage at the expert level. The study aimed to suggest a clear manual for the management and practice that could be used for identifying the nurses' competences (Benner 1984; Leistner & Carlin 2019).

Undergraduate nursing education admits Benner's adaptation of Dreyfus's model of skill acquisition for nurses, and Duchscher's Stages of Transition theory and Transition Shock model by teaching nursing skills. Murray, Sundin & Cope (2019) discussed how researchers, nurse educators, and experienced nurses could support the newly registered graduate nurses during their transition to clinical practice and provide them with a structured basis for evaluation. Consequently, they stated, "Benner's Novice to Expert model and Duchscher's Stages of Transition Theory and Transition Shock model provide a framework upon which experienced nurses, nurse

educators, and researchers may review expectations of the NGRN” (p.200). Benner's Novice to expert model of skill acquisition that was adopted from Murray, Sundin & Cope (2019) is presented in figure 3.

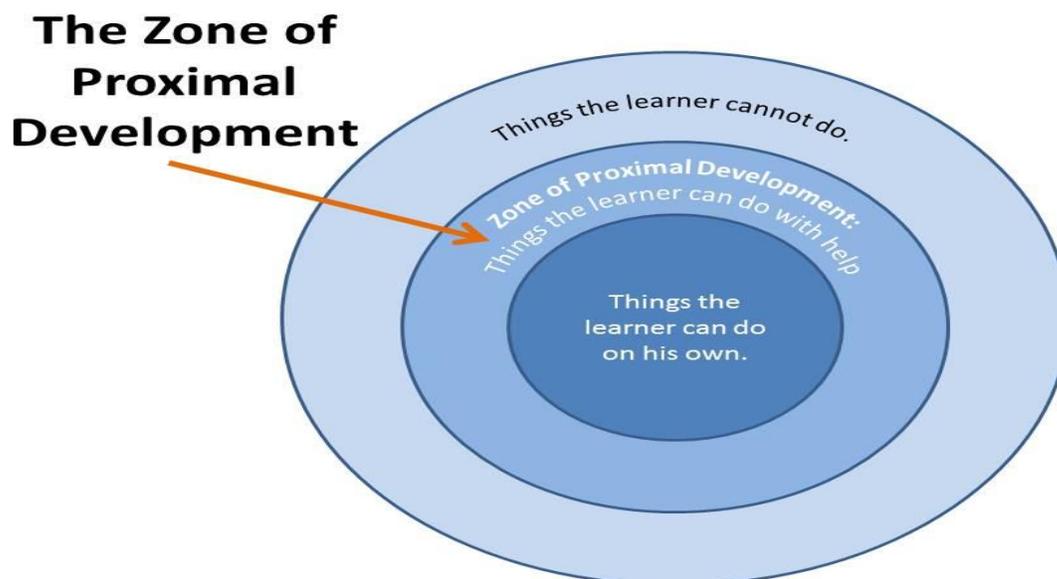


**Figure 3** Benner's Novice to expert model of skill acquisition. Adopted from: (Murray, Sundin & Cope 2019).

## 2.1 Vygotsky's cognitive theory' (1978).

The theoretical framework of the critical thinking (CT) of this study will be based upon 'Vygotsky's cognitive theory' (1978). This theory has been very popular in many nursing institutions for many years and has been used in many studies to provide a better understanding of the relationship between the students and their educational environment. Vygotsky's cognitive theory focuses deeply on the socio-cultural concerns of the learners and their teaching environment that has made the nursing leaders adopt it in most of the nursing academic institutions more on UAE nursing education status (Aliakbari et al. 2015). 'Vygotsky's zone of proximal development (ZPD)' (1896–1934) has been recognized to be the best framework to follow the students' development of a new skill and build up the required competencies' at their educational institutions. It starts by building on their existing abilities to reach higher levels of capabilities through the support and the direct guidance of their skilled teachers immediately after each positive

or negative feedback. Recommendations of making use of the ‘Vygotsky’s zone of proximal development (ZPD)’ framework by many nursing researchers’ have appeared frequently in many well-recognized nursing journals over the past years. Moreover, the ZPD theory has been adopted by many nursing colleges curriculum to prepare their students’ starting from their personal level of knowledge following their students on how they are developing their critical thinking. The theory understand that the students can do things by their own then the curriculum will develop their critical thinking and by that they could move to the second level as they can do things with help. The ZPD clinical and theoretical knowledge is presented in figure 4 below (Berragan, 2011; Priharjo & Hoy, 2011; Rhodes, Schutt, Langham, & Bilotta, 2012; Brosnan, & Creavin, 2011; Phillips et al., 2013; Westbrook & Li, 2013).



*Figure 4* Peterson, C. (2010) 'Vygotsky's zone of proximal development (ZPD)'

## 2.2 Richard W. Paul (1980's) critical thinking theory

Since the 1980's Richard W. Paul has been considered the founder and the leading scholar of open-minded critical thinking. In his dissertation in 1968, Paul focused on explaining the intellectual tools and analyzing reasoning and critical thinking. Paul (1993) defined critical thinking as "a systematic way to form and shape one's thinking. It functions purposefully and exactly. It is thought that it is disciplined, comprehensive, based on intellectual standards, and,

as a result, well-reasoned. Critical thinking is distinguishable from other thinking because the thinker is thinking with the awareness of the systematic nature of high-quality thought, and is continuously checking upon himself or herself, striving to improve quality of thinking” (p. 20). This definition was the foundation of Alfaro-Lafevre (2013) book ‘Critical Thinking, Clinical Reasoning, and Clinical Judgment: A Practical Approach’ with a further connection to the clinical judgment after a previous individual critical thinking and clinical reasoning process to create clinical health decisions in clinical settings. According to Leibold (2019, p.15) critical thinking has been defined as “an active, internal process of defining the problem, situation, issue, or dilemma; performing a systematic search; planning; inquiring; determining assumptions; exploring alternatives; independently analyzing; logically reasoning; explicating rationales, and reaching a conclusion”, and decision making “is the act of deciding something”.

Researchers have found that critical thinking is a very valuable component for nurses in both areas of nursing education and clinical practices. Increasing the nurse’s complicated critical thinking skills within the unstable environmental work settings is the only assured measure for professional and effective nursing management. For that, most of the nursing professional organizations have added CT capabilities to their nurses’ clear roles, and they need to make sure that their nurses combine the CT cognitive skills with other personal attributes to guarantee their jobs (Facione, et al. 1995; Mundy & Denham, 2008; Searing & Kookan, 2016).

The nursing profession has been occupied with daily challenges concerning their patient’s healthcare opportunities. In order to select the best practices one would need to consult the most up-to-date research and medical and nursing information (Benner, Hughes, & Sutphen, 2008; Morrall & Goodman, 2013). Although it was found that the applications of effective critical thinking and problem-solving processes start dynamically with a problem and end with its solution through deep analysis and clear interpretation of its elements when evaluating the findings, there was no agreement among researchers on effective strategies (Gul et al., 2010; Oliveira, Püschel, Díaz, & Cruz, 2015). Researchers found a great connection between the individuals' critical thinking abilities and their innovation to find suitable alternatives to any decision. The critical thinker would try his best to explore many alternative solutions for his problem to end by making the best decision. Moreover, this process could minimize any unexpected errors through the individual’s deep critical thinking analysis (Leibold 2019). For that reason, the American Nurses

Association code of ethics guided the nurses to choose their nursing care alternatives based on the individuals' explicit values and ethics in every situation (ANA 2015).

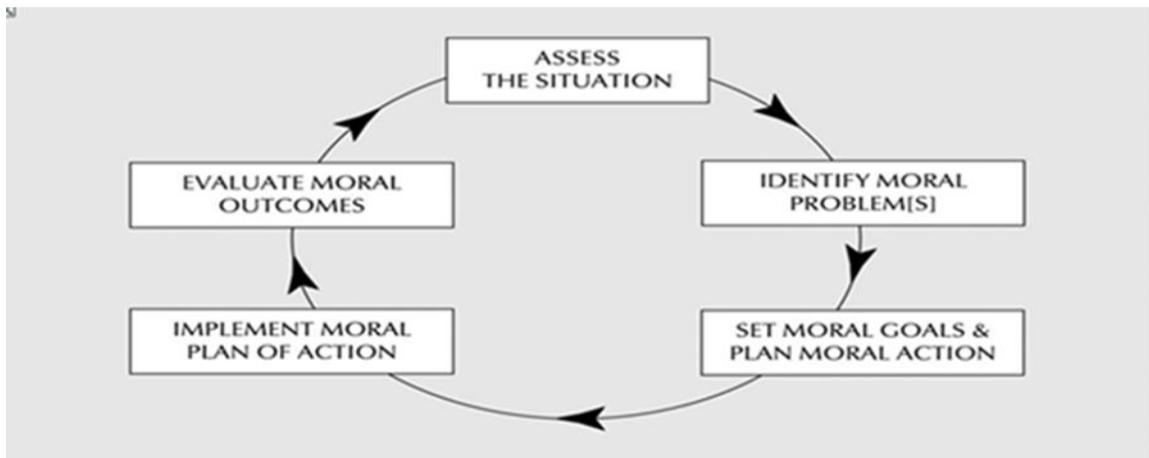
### **2.3 The Moral Reasoning Theory**

According to Kuiper, O'Donnell, Pesut, & Turrise (2017, p. 424) clinical reasoning has been defined as "reflective, concurrent, critical, creative, and systems, and complexed thinking processes embedded in nursing practice that nurses use to filter, frame, focus, juxtapose, and test the match between a patient's present stated and the desired outcome state". Reasoning has been defended as the use of values, facts, evidence, and experiences to reach a conclusion (Merriam-Webster, 2018). Meanwhile, clinical judgment has been defined as "a developmental process that includes the cognitive skills of noticing, interpreting, responding in the application of knowledge and experience to make clinical decisions about the care of patients/families/communities" (Leibold 2019, p.15).

'The Moral Reasoning Theory' of Lawrence Kohlberg (1969, 1976, & 1981) is the cognitive theory that has been adopted as a theoretical framework of the moral reasoning (MR) investigation of this research study. Kohlberg's earlier findings have become a key factor in guiding many nurses to practice moral reasoning skills (Swisher 2010). In addition, Kohlberg's theory helped them to find the best solution and pass the best moral judgment for any medical and nursing issue or moral dilemmas at the hospitals (Swisher 2010; Rushton, Kaszniak & Halifax 2013). On the other hand, Valley (2014) had criticized the earlier Kohlberg's moral education theory for its focus on the children's moral judgment. After that, it was criticized for its incapability to promote the content of morality and for its ignorance of moral sentimentality (Eyikara & Baykara 2017).

Nursing critical thinking has been described as a contentious process of care to progress the patients' health outcomes (Leibold 2019). While others defined critical thinking as "purposeful, informed, outcome, focuses thinking that is guided by standards, policies, ethics codes, and laws" (Alfaro-LeFevre 2017, p. 6).

Explicitly, this study is exploring the UAE nursing students' development of 'moral reasoning' and examining the ability of the students to act freely and independently in their health care settings while practicing their decision- making morally and autonomously. The above two elements correspond with the selected theory as they are the central themes of the moral reasoning theory and can clarify and support the study findings. This theory has also been utilized successfully by other researches in the nursing field (Chiarella & McInnes, 2008; Escolar-Chua 2016). The Moral Decision –Making Model is presented in figure 5 below.



**Figure 5** The Moral Decision –Making Model Adopted from: (Johnstone 2010, p. 108).

#### **2.4 Leininger’s Culture Care Theory’ (1988)**

Care has been defined as "assistive, supportive, or facilitative acts toward or for another individual or group." (Leininger 1988, p. 9), and its goal in nursing education and practice is to “provide culturally congruent nursing care as a pathway to health and wellbeing or to help people face disabilities and death” (Leininger 1995, p. 102). Accordingly, the cultural sensitivity in the study is supported by the well known ‘Leininger’s Culture Care Theory’ in the nursing field (Leininger 1988; Nursing Theory 2013a; Nursing Theory 2015).

The nurse-patient trustable relationship should be based on a respectable understanding of the patient’s cultural needs in healthcare settings (Eyikara & Baykara 2017). Building such a decent and strong relationship could be guided by the cultural care theory to fulfill the patient’s health care needs and meet his personal values. Various cultural features have been stated within the

cultural theory to guide the nurses and inspire them to evaluate the individual's medical and psychological conditions, treat their diseases and even provide appropriate end of life care (Leininger 1988 & 2011). Expert nurses are concerned about providing 'culturally congruent care' at the healthcare systems and training the nursing students to adopt the cultural care approach during their preparation at their universities. However, culturally congruent care could be encouraged and directed through implementing the Leininger culture care theory within the nursing curriculum and within the nursing assessment process at the hospitals (Lancellotti 2008; Rushton, Kaszniak & Halifax 2013).

### **2.5 Lovering 'Crescent of Care nursing model'**

This study is focused on the Islamic culture in specific, as it will study the cultural sensitivity of the nursing students in the UAE. For that, the 'Crescent of Care nursing model' was found to be the best model to fit this unique context. Sandy Lovering worked diligently to guide the nurses in Saudi Arabia on how to provide culturally competent care for their patients. Accordingly, Lovering has initiated the 'The Crescent of Care nursing model' to support the community in Saudi Arabia. This model has been derived from her ethnographic study on the Arabic Muslim nurses caring for the Arabic Muslim patients in the Middle East region. The 'Crescent of Care nursing model' proved to provide the 'missing connection between Western and Arab Muslim nurses'. This caring model has launched a framework for Arab Muslim nursing practice and education within an Arabic Islamic culture (Lovering 2008 & 2012).

Lovering (2008) conducted an ethnographic study in the Middle East region exploring the health beliefs and values of Arab Muslim patients and Arab Muslim nurse's care. The study has established the Crescent of Care nursing model, which is based on the holistic approach to the patients' spiritual, cultural, psychosocial, interpersonal and clinical caring, to guide the nursing profession in the Middle East. However, the focus and heart of the study have been targeting the patient and his family. Lovering has stated, "as a culturally specific model for Arab Muslim populations, the model can be used to guide nurse education curricula in the Middle East region and the Gulf and improve the image of nursing in the Arab world. The model also serves a more general-purpose in guiding the care of Muslim patients in other settings" (Lovering 2008, p224).

The study population examined Arab Muslim nurses from Saudi Arabia, Jordan, Egypt, and Lebanon within the setting of Saudi Arabia. Another essential point, Muslims have total obedience to the determination of Allah (God) which is guided them on controlling personal, social, political-economic, moral and spiritual matters in their life (Rashidi & Rajaram, 2001). The model reinforced the practice of non-Muslim nurses caring for Arab Muslim patients and became the basis of nursing curricula in the Middle East region (Lovering 2012). The Lovering ‘Crescent of Care nursing model’ is presented in figure 6 below.



**Figure 6** The Lovering ‘Crescent of Care nursing model’ Adopted from: (Lovering 2012., p. 173).

## 2. Literature Review

This part will be divided into three main sections. The first section will address the safe professional nurse’s preparation. Then, the second section will focus on the standard- based nursing education/curriculum. After that, the third section will present the nursing education

reform. The purpose of this study is to examine the quality of clinical decision-making among UAE nursing students. These sections have been selected based on their importance in preparing safe and professional nursing students to work in the healthcare systems. The role of the nursing education curriculum influences the development of the nurses' skills, knowledge, and attitudes in their clinical practices, which in turn would contribute to their patient's safety. "The improvement of patient safety in the healthcare system depends on knowledgeable nurses who have been taught and trained based on a well-established and sound nursing curriculum" (Vaismoradi 2012, p103).

Consistently, nursing education had many perspectives and challenges in conducting safe professional preparation, a standard-based healthcare education curriculum, educational reform, and providing healthcare education within the social determinates of health. The following sections are going to give further details for these challenges.

### **3.1 Health and nursing education perspectives and challenges**

Today, global health leaders need to practice constant leadership management with extraordinary managerial skills, which are based on open-minded perspectives to influence all communities nationally and internationally. Accordingly, healthcare leaders should be skilled with a broad vision and solid strategic and critical thinking competencies. Additionally, respecting and accepting others' values and views are key characteristics for every international health leader to understand the wider contexts needs (Edmonson et al. 2017). On the other hand, recent studies have announced the excessive shortage in healthcare workers for many reasons such as their inability to make good clinical decisions, moral distress besides the dramatic increase in the health education cost for the past fifty years. In fact, researchers realized that the cost of healthcare delivery would continue to increase followed by the same increase in the health education costs (Tsekleves & Cooper 2017).

#### ***Quote***

"Do not go where the path may lead; go instead where there is no path and leave a trail."

- Ralph Waldo Emerson

Furthermore, other recent studies have drawn the attention of health leaders for having new health professional graduates in the health fields to overcome the expected shortage (Leistner & Carlin 2019). Murray, Sundin & Cope (2019) highlighted the importance of having new graduate registered nurses' (NGRNs) in the nursing field as they stated, "New graduate registered nurses are an important cohort of the nursing community, bringing current evidence-based theory and a fresh vigor to the workplace" (p.202). Though Regan and colleagues (2017), found that the newly graduated nurses were facing a hard time during their transitional time from theory to practice, and they described them as vulnerable and needing support with clear directions. At the same time, they found that they were loading the other registered nurses and adding load to their daily tasks. Meanwhile, others aimed to question the new graduate registered nurses' work readiness and they explored the best ways to integrate these new nurses into the clinical practice (El Haddad, Moxham & Broadbent 2017). For instance, researchers stated, "Career development that adequately addresses the needs of multicultural students is important" (Grier-Reed& Ganuza, 2011, p.1). Accordingly, university curricula and higher education should accommodate the non-stopping developing diversity of pupils, with different ethical, racial and cultural diversity. For example, advanced studies of multicultural career tracks can be a very critical step in that direction (Grier-Reed& Ganuza, 2011). On the other hand, the reality shock of the new graduate registered nurses' was an interesting topic of many researchers in the nursing field. Many studies tried to connect the nurses' early resignation from the profession and the real shock of the new nurses to discover why nurses leave nursing. Then, they explored how the NGRNs should adapt to their new professional working culture and examined their expectations to accommodate their patients' behavioral and cultural needs (Chan 2019; Gazaway et al. 2016; Leistner & Carlin 2019).

Quality care and safe healthcare practitioners have been the highest concerns for many healthcare leaders recently. One of the most common distresses and uncertainties among the current nursing schools was the reforming of the nursing curriculum to improve the students' routine abilities. In comparison, the healthcare systems were aiming and directing their efforts to provide their patients with optimal and holistic care during their hospitalization. Therefore, the nursing educational institutions became motivated to accommodate the community needs by assuring the healthcare sectors that they are providing them with highly qualified professional nurses. Recently, the preferable approach is to integrate the social determinants of health content into nursing curricula from a transformative learning perspective (Thornton 2018).

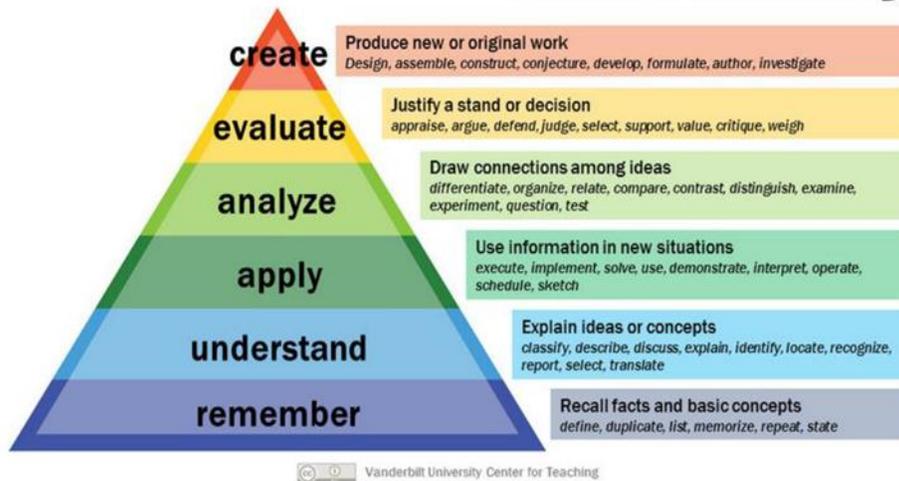
Previous studies have explored the relationships between the student's critical thinking and the used assessment tools at their universities to evaluate their problem-solving skills. In general, the success of any educational institution has been associated with its ability to keep its students in their chosen occupation and improve their performance by updating their assessment strategies. In specific, nursing education had challenged in testing the critical thinking of the nursing students at their high level of critical analyses, to empower them with the best decision-making skills through using the MCQ assessments (Malau-Aduli & Zimitat 2012). Researchers argued that a strong relationship exists between an individual's memory and their critical thinking ability to answer MCQ and the open-ended (OE). For many years, many researchers were interested in studying this phenomenon. For example, Van Der Vleuten (1996) argued that the best indicator to evaluate the quality of the educational institutions was testing the quality of its assessment tools and by measuring the validity and reliability of the applied assessment methods. Therefore, a university with advanced assessment tools to evaluate their educational objectives reflects positively on the curriculum philosophy as well as the learning processes. Several methods currently exist for the measurement of the students' reading abilities and have been tested in many types of research in a large-scale test as; PISA, PIRLS, and DESI to compare the students' academic achievements because of limited reading skills. After that, the combination of the MCQ and the open-ended (OE) became the trend in preparing many assessments to overcome the students' different cognitive abilities (Kim, Walker & McHale 2010).

Critical thinking has been defined as “an active, internal process. Since critical thinking is an internal process, only the outcomes are measurable. Outcomes that may be recognized are defining the problem, situation, issue, or dilemma; performing a systematic search; planning; inquiring; determining assumptions; exploring alternatives; independently analyzing; logically reasoning; explicating rationales; and reaching a conclusion. These cognate functions are not required to occur in any certain order” (Leibold 1993; Leibold 2019, p.15). Khan & Aljarallah (2011) had adopted a broader perspective on testing the students' cognitive thinking skills. They conducted a quantitative study at Qassim University, testing the cognitive development skills of undergraduate medical students from 2005 to 2009. The study followed Bloom's Taxonomy and critical thinking analyses to discover the students' responses to the Multiple Choice Questions (MCQ) as well as the Essay Questions. The researchers explored different students' performance levels with comparison to their abstract thinking. Then, the researchers argued that the MCQ questions have

proved that they were much superior to the essay questions if they were prepared constructively to test the advanced cognitive skills of the students. After that, the researchers confirmed that the essay assessment tools were very difficult for educators to prepare to assess the students' cognitive skills, and it required the students to develop good writing skills to be able to answer the questions.

Previous studies have explored the relationships between Bloom's Taxonomy and critical thinking in education (Kusumoto 2018). Correspondingly, a retrospective study of 307 medical sciences students in 1997, 1998, and 1999 was conducted from the students' files records. The study explored the relationship between the students' performance level and the used assessment tool. The used tools were varied between the MCQ tests and the long essay questions, regardless of the level of the student's results as high achievers and failing students. The most surprising aspect of the data was that the students with high overall grades were the groups who conducted the MCQ examination whereas the groups were made of three types of assessments: the mixed method (MCQ & EQ) exams, long essay questions exams, and the exclusive MCQ exam were the low overall grades (Dagogo et al. 2010). Furthermore, nursing education had applied Bloom's Taxonomy in presenting an evidence-based project and assessing communities as well as evaluating the patients' health education. "Nurses also use it to write learning objectives for patient education. There are levels of thinking and learning from simple to complex. When starting to learn about a topic, it begins with understanding and knowledge, as signified as the lower part of the pyramid. After learning knowledge, it may be applied. Higher-order thinking and learning occur with analysis, evaluation, and creation" (Leibold 2019, p.69). The Bloom's Taxonomy is presented in figure 7 below.

# Bloom's Taxonomy



**Figure 7** Bloom's Taxonomy. Vanderbilt University Center for Teaching. Adopted from: (Leibold 2019, p.70).

Several studies found that there has been a significant relationship between the students' academic progress at the college and their entrance GPA. A study found that talented students with great potential and motivation to study had achieved a very good mark at the college as well. The study stressed that the reason was the students' abilities to build a good connection between social and academic networks with their teachers. For example, the students had good self-confidence in discussing their inquiries about any subject and arguing with their teachers about their given marks. Moreover, the study found that the students' previous academic knowledge and experiences added to their current knowledge and had inspired their progress in the college (Martin 2009).

Diefenbeck, Michalec, and Alexander (2016) argued that the worldwide nursing shortage was a result of the recruitment of nursing students at many universities. The study found many factors that were challenging the recruitment process of nursing students. Race and the students' previous impressions were the main influencing factors that had challenged the nursing universities' administration to recruit more students to accredited nursing programs. Many other factors were included in the study as the students' feelings regarding the admission strategies of the nursing

college and the lecturer's awareness of the students' cultural background and perceptions of the nursing curriculum. Finally, the student's relationship with their peers was another big challenge.

In the same vein, a huge project has been conducted in the United States to motivate the native Alaska students to be recruited into nursing to overcome the historical nursing shortage in the country. The study stated that all the needed social and professional facilities were provided to the students to assure their willingness to join the program and to guarantee their success in the college. Many communities were attracted to the project by marketing the project through tours all over the United States to recruit the largest numbers of youth students to be enrolled in the nursing program. The study clarified that senior students were one of the most effective used tools during these trips to encourage the newly recruited students to join the nursing profession. Both students had shared their previous experiences and actual stories of frustration and success. Senior students were considered as the most effective tool to handle all the challenges and provide advice to the junior students on handling any expected issue from their perspectives. It is worth mentioning that 99% of the students in the project were able to succeed in the NCLEX-RN test, and only 1 student repeated the exit exam and passed at the second attempt because of proper tutoring and good academic advising by peers and academic coordinators (DeLapp, Hautman & Anderson 2008).

### **3.2 The UAE higher education**

The UAE's higher education is following up on the country's education very closely (Madani & Forawi 2019). Certainly, UAE leaders were following nursing education and supporting every innovation in the nursing field to produce capable healthcare professionals with international standards for generating safe and qualified local nurses (Allen & Knibbs 2015; UAE Vision 2021). Additionally, there were massive investments in both health and educational fields to support the nursing shortage in the region. Providing the best qualifications to the students with the best healthcare facilities to promote the UAE community health through pioneer global universities was the goal of the UAE leaders (Wollin & Fairweather 2012). Investing in nursing education and nursing education research in specific became the modern trend to improve the health of any society through solid and updated nursing research education globally. Meanwhile the UAE leaders believed that it is the best investment ever (El-Zubeir, Rizk & Al-Khalil 2006).

The UAE higher education had encouraged their researchers to investigate and study the students' perceptions about their educational institution, and had inspired them to talk about their feelings concerning the teaching curriculum careers at their institutions as part of the routine inspiring steps for educational evaluation and improvement (Wilkins, Stephens Balakrishnan & Huisman 2012). El-Haddad (2006) has argued that nursing has been considered as a last choice for the students to go for because of their cultural limitations to the career, and its general rejection because of the current underestimated image to nurse's job for the local students in the UAE community.

Al Malki (2012) claimed that Saudi Arabia had challenged the performance of the 'non-Arabic speaking expatriate nurses' at their healthcare systems. For example, nurses came with different cultural perspectives and they did not understand the Saudi patients' culture. In the same way, Emirati patients suffered from being cared for by expatriate nurses who did not understand the Islamic religion and cultural values. Moreover, there were legal requirements that prevented interaction between genders. For example, UAE girls were not allowed to interact nor treat male patients and they have been stigmatized as highly trained 'maids'. El Amouri and O'Neill (2014) suggested that UAE has a particular context that needed to respond to the need for applying a change to suit the challenge of its cultural and linguistic diversity. "When people move to live in an unfamiliar culture that has different attitudes and values, and way of life from their own they can experience feelings of disorientation" (2011, p. 26). That feeling refers to as "culture shock" as cited in (Aderibigbe et al 2016). In the 'United Arab Emirates,' they have faced further encounters of working inside a significant linguistic 'multi-cultural diversity' context. Accordingly, leaders supported the 'culturally competent care' as a key requirement within a limited Emirati or mixed Arab origin community. However, the patient's appropriate treatments are relying on the health team's linguistic abilities, cultural sensitivity, and knowledge (Aderibigbe et al 2016). A complex condition arose that required 'non-Arabic nurse-leader-managers' to deliver further induction programs to include ethical and moral education, including Islamic Arabic values for the expatriate nurses' to encounter any cultural sensitivity (Campinha 2011; Aderibigbe et al 2016).

The UAE governmental vision for the nursing career was to generate the greatest number of professional and qualified local nurses among the UAE healthcare systems (Wollin & Fairweather

2011). Therefore, the UAE higher education worked hard to support the government's goal by having a strong educational collaboration with many international universities to educate the local nursing students and prepare them to lead the nursing profession (Hannawi & Al-Salmi 2013; Wollin & Fairweather 2011). Many studies argued that the obvious change that has been applied to adopt the governmental goal of improving the UAE nursing education was the collaboration with many international high standard universities. For instance, in 2007 they affiliated one of UAE nursing colleges with one of the famous Australian nursing universities called Griffith University. Their mission was to replace the available diploma-nursing program with the Bachelor program for both the undergraduates' level as well as the bridging program for the post-graduate level (Wollin & Fairweather 2011).

Accreditation of the health education institutions was another important goal of UAE as with any government to enable their graduates to complete the licensing of professional certification for practice. Moreover, accreditation would assure their product educational standards through a worldwide systematic assessment of practices within global diversity (Allen & Knibbs 2015; Frenk et al. 2010). "Global cooperation should be promoted by relevant bodies, including the WHO, UNESCO, World Federation for Medical Education, International Council of Nurses, World Federation of Public Health Associations, and others, to help in setting standards" (Frenk et al. 2010 p. 1953).

The 2020 global perspective for healthcare providers and professional nurses has been discussed among the global healthcare leaders' meetings. Then, they announced the first eight essential nurse leader competencies by the Canadian Nurses Association (2009). Accordingly, the establishment of the healthcare professional leader competencies helped the healthcare organizations to prepare their nurses to run that professional role very early. Moreover, the nursing educational institutions started to prepare their nursing students with the required leadership skills based on the Canadian Nurses Association eight leadership competencies to meet their societies health needs (Canadian Nurses Association 2009). Furthermore, merging the ethical nursing practices at the beginning of the student's life was one of the core targets of the eight competencies. The global educational institutions need to assure the stability of the learned practices within the healthcare settings. Today, the role model nurse leaders should be disciplined, control their reaction towards any situation, open-minded, think rationally, and practicing evidence-based skills

(Oulton 2014) and apply leadership skills (Frenk et al. 2010). The UAE nursing profession at the health care systems and the nursing and midwifery council design their policies by following the international standers as the ANA Standards of Professional Performance (Southeast et al., 2020) which are:

Standards of Practice: The Standards of Practice describe a competent level of nursing care as demonstrated by the critical thinking model known as the nursing process. The nursing process includes the components of assessment, diagnosis, outcomes identification, planning, implementation, and evaluation. Accordingly, the nursing process encompasses significant actions taken by registered nurses and forms the foundation of the nurse's decision-making.

Standard 1. Assessment The registered nurse collects pertinent data and information relative to the healthcare consumer's health or the situation.

Standard 2. Diagnosis The registered nurse analyzes the assessment data to determine actual or potential diagnoses, problems, and issues.

Standard 3. Outcomes Identification The registered nurse identifies expected outcomes for a plan individualized to the healthcare consumer or the situation.

Standard 4. Planning: The registered nurse develops a plan that prescribes strategies to attain expected, measurable outcomes.

Standard 5. Implementation The registered nurse implements the identified plan.

Coordination of Care The registered nurse coordinates care delivery.

Health Teaching and Health Promotion The registered nurse employs strategies to promote health and a safe environment. Scope of Nursing Practice Nursing: Scope and Standards of Practice, 3rd Ed.

Standard 6. Evaluation The registered nurse evaluates progress toward attainment of goals and outcomes. Standards of Professional Performance The Standards of Professional Performance describe a competent level of behavior in the professional role, including activities related to ethics, culturally congruent practice, communication, collaboration, leadership, education, evidence-based practice and research, quality of practice, professional practice evaluation, resource utilization, and environmental health. All registered nurses are expected to engage in professional

role activities, including leadership, appropriate to their education and position. Registered nurses are accountable for their professional actions to themselves, their healthcare consumers, their peers, and ultimately to society.

Standard 7. Ethics The registered nurse practices ethically.

Standard 8. Culturally Congruent Practice. The registered nurse practices in a manner that is congruent with cultural diversity and inclusion principles.

Standard 9. Communication The registered nurse communicates effectively in all areas of practice.

Standard 10. Collaboration The registered nurse collaborates with healthcare consumer and other key stakeholders in the conduct of nursing practice.

Standard 11. Leadership The registered nurse leads within the professional practice setting and the profession.

Standard 12. Education The registered nurse seeks knowledge and competence that reflects current nursing practice and promotes futuristic thinking. Nursing: Scope and Standards of Practice, 3rd Ed. Scope of Nursing Practice

Standard 13. Evidence-based Practice and Research The registered nurse integrates evidence and research findings into practice.

Standard 14. Quality of Practice The registered nurse contributes to quality nursing practice.

Standard 15. Professional Practice Evaluation The registered nurse evaluates one's own and others' nursing practice.

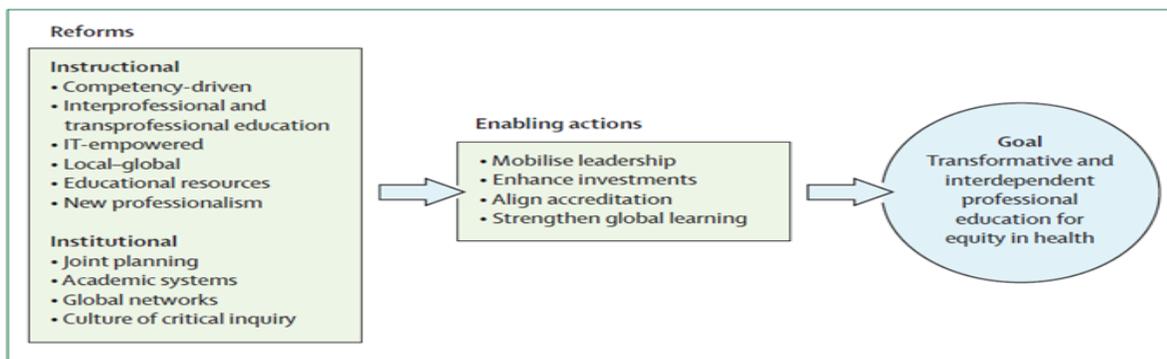
Standard 16. Resource Utilization The registered nurse utilizes appropriate resources to plan, provide, and sustain evidence-based nursing services that are safe, effective, and fiscally responsible.

Standard 17. Environmental Health The registered nurse practices in an environmentally safe and healthy.

The current healthcare profession's weak leaders with low capabilities forced the health education systems to work on developing their graduates' competencies and update their

knowledge to face the competition in the professional labor market (Frenk et al. 2010). Researchers confirmed that identifying the current global health issues could reflect on the local and global nurses positively. In addition, it will facilitate the implementation of the best health treatments and solutions effectively. For that, the nurse leader role has been expanded outside her/his traditional role within their healthcare setting boundaries to reach other hospitals and other healthcare settings and beyond the community to implement the needed change. Fighting against emerging global health issues is a complex process that needs inclusive considerations as simple solutions do not exist within global health issues (Edmonson et al. 2017).

Over the past 100 years, many studies have focused on reforming the health education curricula among all health professional universities and trying to integrate the modern sciences to the curriculum to strengthen their graduates with the needed knowledge. All these changes were recommended to face the 21st-century increasing of life span. Indeed, the expected challenges and complexity within the recent healthcare system called for an urgent need to face the threat of environmental, behavioral risks, new infections, besides the health professional shortage with high healthcare costs (Frenk et al. 2010). The example of the recommendations for reforms and enabling actions is presented in figure 8 below.



**Figure 8** Recommendations for reforms and enabling actions. Adopted from (Frenk et al. 2010 p.1953).

Tsekleves & Cooper (2017) had an interest in studying health by applying a new vision that contributes significantly to improve the healthcare future. The researchers aimed to find new ways of designing new healthcare education by offering new research designs with new perspectives on emerging trends. First, the authors conducted a thematic analysis approach study. Then, 26 case

studies and 18 themes that have appeared across different healthcare settings from the analysis results. Next, the authors focused on public, acute, chronic and aging well health. Accordingly, different design disciplines as ‘architecture, communication, product, service, behavior design analyses, digital technology in designing healthcare’, have been discovered concerning research challenges and opportunities. Nevertheless, the authors conclude that preventive healthcare was the immediate key challenging agenda that needed direct attention.

### **3.3. Moral reasoning preparation for safe professional nurses’**

Many studies confirmed that when the number of qualified healthcare professionals increases, the quality of individuals’ health in any community would increase subsequently. Healthcare professionals play a vital mediating role of applying knowledge as communicators, educators, team members, managers, healthcare leaders, and policymakers to improve the people’s health. Therefore, a vast investment should be spent on health education and training from the national government's budgets to assure the healthcare institutions' quality and international accreditations (Frenk et al. 2010). Researchers attempted to evaluate the impact of critical thinking and moral reasoning on the safety and quality of health. During health dilemmas, the process of understanding the situation and finding the best solutions through good analysis and planning the appropriate interventions will lead to the best and safest outcomes (Leibold 2019). Likewise, Leistner & Carlin (2019) focused on the growing movement of the nurse’s clinical professional development. The study was following-up the nurse's work progress in the nursing field starting from being a novice nurse until they reach an advanced stage at the expert level. The study has suggested a clear manual for the nursing management leaders that could be used as a guide for identifying the nurse’s competences development steps. In addition, the study targeted the Assisted Living (AL) nurse community and facility leader in the practical field. Indeed, during the nurses’ professional career the nurses aim to build their skills and strengthen their knowledge to move on and expand their competencies by applying clinical experiences (Benner 1984; Leistner & Carlin 2019).

## *Quote*

“Think and Wonder and Think!”

-Dr. Seuss

Worldwide health education reform and nursing education developments went through three generations in the 20th century. First, the educational innovators taught the ‘science-based curriculum’ at the beginning of the century. Second, they hosted the ‘problem-based instructional innovations’ in the mid-century. Third, they aimed at high-quality care for health equity, which was a ‘systems-based’ to improve the performance of the healthcare system. Then, by the end of the twentieth century, researchers realized that it is important to have competent healthcare professionals with explicit competencies by adjusting global and international awareness. Furthermore, engaging critical and ethical reasoning behaviors were important competencies to participate in ‘in-patient’ and ‘population-centered’ health systems locally and globally. Finally, technological development, economic relations, political interests, and cultural structures of values and beliefs has been recommended (Frenk et al. 2010).

Although international healthcare leaders worked hard to deal with many global health issues, equally, they did not achieve fair and equal control in rural areas. Meanwhile minimizing and controlling the continuous increase in ‘communicable diseases’ is still challenging all healthcare professionals. Studies argued that global health leaders have to ensure health improvement for all by having a strong united voice and solid strategies that can cover all community levels. Attracting independent healthcare workers to work in rural areas was a big challenge for healthcare leaders with limited resources and low salaries (Edmonson et al. 2017). Social inequities and health inequalities were linked together in many studies. For instance, risky diseases were found within the people who are living inside poor living and dangerous working conditions. At the same time, the people who are living and working within a good socio-economic status and enjoying healthy working conditions had reported less serious health issues. The researchers were following this relationship statistically through the infant mortality and morbidity rates as well as the individual’s total income within American society (Rozendo, Salas & Cameron 2017; WHO 2008).

For all of those reasons, the great demand for safe nursing practices in the current challenging healthcare systems forced the nurses to put in place annual strategies and to accelerate strong

progress in their professional development. Accordingly, the nurses need to progress their skills and knowledge to accommodate the new features of the current diseases faced by the healthcare systems and to work independently with the rural communities (Searing & Kooken 2016). Today, the nursing profession requirements have been extended to requesting innovative professional nurses with high cognitive and clinical qualities to generate safe clinical decisions for their patients. The nurses' clinical competences are expanding daily and modified continuously to accommodate workforce expectations locally and universally. Correspondingly, this fast transmission in healthcare has demanded the nursing educational systems to reconsider their curricula to meet the workforce requirements and expectations of hiring safe and innovative nurses (LaMartina & Ward-Smith 2014; Rezaei et al.2015; Searing & Kooken, 2016).

Nursing education in particular has been targeted to promote health equity within every community for a very long time. Many research studies had argued that nurses could play many active roles in encouraging health equity such as; a collective action, patient and community advocacy, social justice, and empowerment of the vulnerable. Nurse educators found great challenges in implementing changes within the nursing curriculum to modify health inequalities that may help in preparing strong healthcare professionals to face the current inequalities if not reformed radically (American Association of Colleges of Nursing 2008). At the same time, the expectations of the new nurses were moving towards highly competent nurses with strong critical reflection abilities to apply the needed change. As a result, professional nursing bodies like the American Association of Colleges of Nursing and the Canadian Nurses Association, and the International Council of Nurses had supported all the recommendations of strengthening nursing education. Furthermore, they requested the nursing curriculum to prepare socio-culturally competent nurses to promote justice and respect the human rights for every society (American Association of Colleges of Nursing 2008; Canadian Nurses Association 2008; The International Council of Nurses 2016; Rozendo, Salas & Cameron 2017).

Globally, the epidemic nursing shortage (Liu et al. 2017) among the healthcare workforce inspired the researchers in the field to find radical solutions and strong strategies to reduce this lack (Sundin & Cope 2019). For example, developing new theories and models to facilitate an appropriate understanding of the nurses' skills acquisition stages through the transitional period was a worthy solution. Therefore, the transitional period is progressing from being a nursing

student at the college to being a registered nurse at the healthcare facilities after that. Researchers agreed on the importance of understanding the process of transition to practice to facilitate the nurses' development and help them to adopt the appropriate learning support for the new nurses at the hospitals through this journey (Duchscher 2008, 2009). Al Rifai (2008) has pointed out the important impact of developing creative and supportive work environments and open-minded 'nurse-leader-managers' that could enable every patient's wellbeing. Understanding this transitional period will help the educational and professional leaders to maintain competent practitioners in a very fast time. Further, they aimed to study the work environment and the conditions into which the nurses are entering the field (Duchscher 2008, 2009; Murray, Sundin & Cope 2019).

Halpin and colleagues (2017) claimed that the new graduated registered nurses have been facing abundant stressors when they move from a nurses' transition program to the graduate nurses program. The new nurses are facing stressors for many reasons such as 'knowledge to practice gap, challenges from clinical reasoning and critical thinking, the heaviness of responsibility and being scared to question'. The mentioned stressors were discussed in the 'Duchscher's Transition Shock Model', where the model studied reality shock, transition theory, role adaptation, and growth in the development of new graduate nurses and it is presented in figure 9 (Duchscher 2009; Murray, Sundin & Cope 2019).



Figure 9 Duchscher's stages of transition theory. Adopted from (Murray, Sundin & Cope 2019).

Today, the healthcare organizations had extraordinary expectations from the new nurses so that they are ready to work at any facility from day one. Besides this, they expect them to be able to ‘hit the ground running’. Moreover, they anticipated them to provide safe and high-quality care to their patients by translating theory to practice. Those high expectations came from the trust of their educational curriculum and their university preparation programs (Duchscher 2009, Murray, Sundin & Cope 2019; Regan et al. 2017). Previously, Benner (1984) had different expectations for the new nurses when they join work. He believed that they come to the clinical field with very limited abilities and narrow experiences. Reasonably, he had differentiated between the practical knowledge “knowing how” and theoretical knowledge “knowing that”. For an instance, he argued that new nurses would develop and expand their limited knowledge through more exposure to clinical situations at work. The more exposure to real clinical situations, the more the new nurses would become experts and able to provide safe patient care. Moreover, Benner expressed that the new nurses were stressed to harm their patients for the reason of lacking the experiences and having low clinical experiences. In addition, the new nurses used to be worried to report that harm when it actually happened to their colleagues, senior nurses, medical staff, and allied health team. Respectively, all of these challenges motivated the nurse educators to facilitate the new nurses' training time carefully during their first month of experience at the hospitals. Moreover, understanding the transition to the practice process supported the nursing researchers to understand the new nurses' emotional and professional attitudes. Accordingly, nursing graduates could provide their patients with better and harmless care during their transitional process. Thus, the more practice the new nurses do, the more knowledge they gain to assure their patients' quality of care (Murray, Sundin & Cope 2019).

The continuously increasing number of chronic diseases with their frequent complex features has urged the nurses to improve their competencies for a professional and efficient response (Searing & Kookan, 2016). This has demanded a drastic change in improving the nursing educational teaching strategies in higher educational institutions to prepare critical thinking students with prodigious abilities to face rapid healthcare changes and provide a high quality of healthcare. Therefore, preparing critical thinking students has become a prioritized goal among the nursing educational reformers (Rezaei et al.2015). LaMartina & Ward-Smith (2014) claimed that the nursing career should be armed with professional nurses through high cognitive and clinical skills and qualities. These qualities should be based on developing the nurses' critical thinking

abilities to assure their capacities in making mature and correct healthcare decisions. Today, both the nursing education systems and healthcare management should share the responsibility for preparing professional nurses to meet community needs. The urgency for professional distinguished nurses has arisen from the complexity of the healthcare settings and the challenges of providing patients with holistic and competent care.

Consequently, researchers confirmed that simulation labs could be a safe environment for the students' development of critical thinking skills and essential for nursing education. Many research studies have agreed that the students' critical thinking motivated and increased through the students' exposure to the simulation lab experiences at the nursing schools (Adib-Hajbaghery & Sharifi 2017). In comparison, Alharbi (2019) argued that there was no significant increase in critical thinking skills nor the grades of nursing students after their exposure to the simulation experiences at the nursing universities. In addition, simulation labs are considered very safe and conducive for the learning environment for the nursing students. Simulation labs helped the nursing students to be self-directed to develop their critical thinking skills. Many nursing schools found that the simulation labs supported their students to plan their healthcare decisions and could provide them with a safe environment to practice decision-making and problem-solving skills as if they were in the actual clinical settings. Nevertheless, simulation labs could stimulate nursing students to think critically by involving them in making the correct decision. Using different scenarios close to the actual situations helped the students to respond properly with high self-confidence. Finally, simulation labs reduced medical and medication errors and minimized the patients' infections and injury cases (Adib-Hajbaghery & Sharifi 2017; Alharbi 2019).

A large and growing body of literature has investigated critical thinking and education in the nursing field. For example, many studies found a great relationship between critical thinking skills and peoples' abilities in problem-solving skills. In addition, they differentiated between the two common terms, problem solving and decision-making. Then, other authors had compared them to the individual's internal personalities and experiences with the individual's critical thinking background. Although various researches confirmed that both problem-solving and decision-making had required critical thinking abilities, other studies confirmed that decision-making could be used to make daily decisions without facing specific problems to solve (Leibold 2019). Different theories exist in the literature that had examined critical thinking skills applications and

advantages. For example, many educators who worked with their students to promote the students' independent thinking skills have used Feuerstein's (1980) Instrumental Enrichment model. The Instrumental Enrichment model has directed the educators to use the following seven steps to promote the critical thinking of their students. The seven steps were the identification of the problem, gathering information required, developing sequences of action, analyzing advantages and disadvantages of each sequence of action, determining the best sequence of action and limiting alternatives, implementation of the decision and finally evaluation of the decision (Stroman 1990; Leibold 2019).

Currently, the nursing shortage is a serious threat in obtaining high-quality healthcare services with qualified health professionals all over the world. Meanwhile the low number of student enrolment into the nursing colleges has led to a noticeable expected shortage that will increase in the near future. Accordingly, many recruitment policies and nursing education strategies needed to be reviewed and updated to enhance the enrolment of young talent to the nursing profession (Herzlinger 2013). This view has been supported by Foxall (2013) who confirmed that the coming nursing students' generation would be affected by the students' perception of the nursing career as a future profession from their middle schools. Therefore, the students' perception could lead to a great impact on the students' recruitment at the college level. Also, many scholars argued that the main issue within the nursing recruitment process was the misunderstanding of the nursing career in the society and within the health care systems.

Universal actions have been taken to overcome the nursing shortage. This deficiency has resulted from the complexity of the healthcare settings when facing ethical and moral dilemmas (Burkhardt & Nathaniel 2014). Therefore, one of the planned strategies was to reinforce the nurses' ethical decision-making abilities and develop their professional maturity since this was found to be one of the critical reasons for the existing shortages (Ulrich et al. 2010; Burkhardt & Nathaniel 2014). For the same reason, nursing educational managers have decided to train their graduates and prepare them with safe and professional practices in the healthcare field. Accordingly, they decided to redesign their nursing curricula to match the current complicated needs of the nursing profession and protect both the patients' health and the nurses themselves. Moral distress among nurses results from incorrect and unsafe ethical and moral reasoning decisions besides its harm to

the patient's health (Mundy & Denham 2008). Consequently, the educational leaders have recognized the importance of critical thinking, ethical and moral reasoning abilities that are at the same level of the clinical skills for better clinical judgments and safe practices (Mundy & Denham 2008; Zoboli & Schweitzer 2013).

Correct diagnoses of the current complicated patients' health issues required the nurses to have critical thinking (Kantek & Yildirim 2019) and clinical reasoning skills to make their choices during their delivery of healthcare (Kim et al. 2014). A quantitative descriptive correctional study has been conducted on the baccalaureate-nursing students in Egypt testing the relationship between the critical thinking dispositions and learning approaches using the California Critical Thinking Disposition Inventory (CCTDI). The study has found that the learning approaches could have a positive correlation with the critical thinking of the students. They recommended utilizing critical thinking in the nursing curriculum. Then, increasing the students' exposure to more learning experiences for making better decision judgments in clinical settings. Furthermore, the study had recommended further researches in studying the nursing students' critical thinking progress (Kabeel & Eisa 2016). Recently, nursing authors have stated, "Fostering emotional intelligence and critical thinking disposition among nursing students would enhance their problem-solving skills and judgment abilities which in turn, lead to providing more qualified clinical services. Educational training courses, workshops and, seminars should be prepared specifically for all academic levels for more development and enhancement of these skills"(Abou Hashish & Bajbeir 2018, p.350).

On the other hand, Abu Bakar et al (2017) have carried out a study on nurses' spirituality and its effect on improving their caring behavior. Caring has been acknowledged as a behavior of giving holistic assistance to people. Unfortunately, spirituality was found not to be routinely implemented in many nursing practices. The study highlighted that the personality and the spirituality of the nurses that could formulate and change their caring behaviors. Spirituality would influence people's actions in a positive way (Price 2011). Moreover, the study found that nurses had the passion to perform noble actions if their spirituality guided their nursing care through regular spiritual training. Finally, the study has recommended further studies on the nursing interventions of Islamic patients. The morality has been known as a critical and sensitive topic in the literature (Rushton, Kaszniak & Halifax 2013), and was defined as the need to listen to people's

deep feelings, and stories (Price 2011). Many researchers evaluated the student's feelings and impressions on their curriculum with more focus on ethical decision-making, moral reasoning, and critical thinking. Exploring the students' feelings could help in finding the best curriculum that could bridge the theory and practice. Exploring the students' opinions, beliefs, and attitudes towards critical thinking, moral reasoning, and cultural sensitivity could help in reforming and modifying the current nursing curriculums for better outcomes (Butin 2015; Zoboli & Schweitzer, 2013; Escolar-Chua 2016).

Truong (2017) had discussed in her study the importance of the cultural competencies at any health organization in understanding the racial and ethnic minorities by the health care providers to deliver their health services to any local community (Just treat everybody with respect). A recent study found a significant relationship between two factors, the nursing graduate's cultural competences and their nursing curricula preparation that can contribute to reducing social and health inequalities. The expectations of these graduates were advanced, as they are going to be more capable of advocating cultural safety and social responsibility among their communities. Accordingly, high expectations came from the training efforts at their university curriculum. The study found that the students were trained to practice resilience, spirituality, social justice, ethics, and healthy public policy during their nursing care (Rozendo, Salas & Cameron 2017).

Moreover, a qualitative study was conducted on 27 Pakistani nursing students from October 2016 to February 2017, and the study found that for most of the nursing students who enrolled in the nursing programs their original passion was a different profession rather than nursing. The nursing profession was not most of the students' professional dream nor their profession first or second choice. The majority of the students were forced to study nursing based on their families' ability to support them financially as culturally it was the best job for all the women there. The study recommended the educational stakeholders to work on improving the nursing students' perception of the nursing profession and implement new policies to support the professional development of the nurses (Faheem et al. 2018). In addition, in other studies, the educational leaders found that the nurse's personal and social development would lead them to develop their professional identity positively through improving the current nursing teaching methods. In 2017, another descriptive cross-sectional study on 216 nursing graduates in China found that the nursing

education curriculum should integrate the students' professional identity development as a contributing factor to produce a good nursing practice and progress a mature professional nursing career (Guo et al. 2018). Both studies supported the significance in motivating the nursing students to work on improving their professional development to be able to survive and work safely within the modern complex health care systems.

Many studies in diverse countries such as Pakistan, China, Sweden, and Egypt are investigating the influential factors and professional reasons that motivate the nursing students in choosing a nursing career as a future profession. The three studies agreed on earning a 'good salary through a guaranteed nursing job' nationally and internationally as a unique influencing factor in motivating the male and female students to be enrolled in nursing. The financial factor was the number one motivating factor mentioned by most of the nursing students. Gender stereotypes or in another term, the feminization of the medical workforce is a common phenomenon within the healthcare profession. One of the main challenges in the health system in some societies is gender competition, as they are expecting and preferring to see female nurses only engaged in bedside care (Frenk et al. 2010). However, others found that, some students had an intrinsic factor that may inspire them and motivates them to help others and support their community then serve suffering humanity. Nevertheless, in one-word passion in developing a nursing professional identity was the minor factor that all the studies found as an internal motivator to most of the nursing students to study for a nursing career (Abudari, Ibrahim & Aly 2016; Guo et al. 2018; Jirwe & Rudman 2012; Faheem et al. 2018).

#### **3.4. Standard- based nursing education curriculum and clinical decision-making**

Globally, the medical education cost had reported a significant increase within the last years (Chen 2010). Likewise, the nursing education cost had increased to reach (\$40,000 to \$200,000) for the four years baccalaureate nursing program in the United States (Chen 2010; Edmonson et al. 2017). Recently, researchers argued that there were inconstancy and mal-distribution of health and health education resources globally. Specifically, they found that China, India, Brazil, and the USA have 150 medical schools each. In comparison, another 36 countries have no medical schools

at all. Another essential point is that the total global costs had reached about (US\$100 billion) for healthcare professional education per year (Frenk et al. 2010). Those findings had illustrated the current and expected healthcare provider shortage within every society. Finally, studies found other common reasons behind the healthcare professional shortages as not having a satisfactory job to practice their chosen profession after graduation, could not meet their standards of living, and unable to afford the usual living expenses (Edmonson et al. 2017).

***Quote (p.61)***

"The value of a college education is not the learning of many facts, but the training of the mind to think."

-Albert Einstein

In recent times, restructuring the nursing curriculum became a vital need to improve the quality of the nursing profession and having a standard-based health education in particular. Besides, working on developing the critical thinking in nursing practice and curriculum was another challenge within many nursing education systems to contain the continuous complexity at the healthcare facilities. Similarly, meeting the patients' needs and providing safe professional nurses to deliver high-class and holistic patient care has increasingly become the main target of all healthcare management (LaMartina & Ward-Smith 2014). Furthermore, motivating the nursing students' interpersonal capabilities, creating knowledgeable and independent nurses are a serious concern for every nursing university management in the twenty-first century (Roland, Johnson & Swain 2011). Researchers confirmed that healthcare leaders stated that re-examining the health education curriculum became necessary to meet the global increased knowledge, technologies, and financing demands at the healthcare systems. For example, over 20 professional and academic leaders from different countries in medicine, nursing, and public health professions had joined the Commission on the Education of Health Professionals in 2010, to come up with a new vision for health education with diverse perspectives, to design a framework joining the health education and care systems. The framework created new strategies that can serve the healthcare market and influence positive effects on the patients' health outcomes (Frenk et al. 2010). Consequently, independence in the nursing profession and enhancing the decision-making and problem-solving skills among the nursing students during their early education before their graduation was

announced as the new vision (Cruz, Pimenta & Lunney 2009; Moattari et al. 2014; Edmonson et al. 2017).

The code of conduct standards became another essential element to direct the nursing professionals and the other healthcare team members' actions to be able to face the current complexity of the contemporary healthcare facilities (Swisher 2010). Maintaining morals with capable skills and handling responsibilities (Kyriacos 1995) are elements that would minimize moral distress at the workplace (Schaefer & Vieira 2015). For the reason of having a solid base of nursing professionals in the healthcare field, the nursing educational leaders have put great efforts into developing and reviewing the nursing curriculum. In addition, the researchers were able to deliver a prodigious number of theories to serve both the nursing education and the healthcare practical filed. Previous research findings found that the "Moral Reasoning Theory" is a cognitive theory that has been introduced by Cooper (1997) based on the previous efforts of Kohlberg (1969). Then, it has become the main reference for any inquiries at the nursing filed, especially those dilemmas related to nurses' moral decisions and judgments (Cook 2016; Swisher, 2010; Rushton, Kaszniak & Halifax 2013). Accordingly, nurses have been required to be capable of taking independent decisions when needed. Finally, the nurse's independence in making daily care decisions has been considered a major element for the nurses' professionalism (Brown 2016; Escolar-Chua 2016).

Meanwhile Geist & Kahveci (2012) have argued that the more the nurses practice decision making in the healthcare settings, the more they improve their 'clinical reasoning skills'. Clinical reasoning skills and clinical judgment experiences have been documented to have a significant impact on the patient's health (LaMartina & Ward-Smith 2014). Many researchers agreed on the strong correlation between the nurses' independent decision-making and their abilities to practice clinical judgment and problem-solving skills that should start from the pre-graduation period. Furthermore, independence in decision-making skills should be embedded within every nursing education system and needs to be based on developing proper critical thinking skills among the nursing students (Cruz, Pimenta & Lunney 2009; Dalmolin et al., 2014; Moattari et al. 2014; LaMartina & Ward-Smith 2014; Rezaei et al. 2015; Mundy & Denham, 2008; Searing & Kooken, 2016).

Globalization has connected the people's thoughts and needs at medical institutions. In Turkey, the new multicultural community raised the need for skillfully trained nurses to meet the cultural differences of their patients. Gözüm et al (2015) conducted a study to measure the Turkish nurses' quality of care within their multicultural population. They adapted the Nurse Cultural Competence Scale (NCCS) into the Turkish language to determine the test validity and reliability in Antalya. A sample of 235 nurses working at different clinics, including internal medicine, surgical, chemotherapy, the emergency was identified through Akdeniz University hospital. The NCCS was used to evaluate the nurses' cultural skills, knowledge and sensitivity using 20 items. The study results showed that the NCCS tool is very reliable and valid to test the Turkish nurses' cultural competence positively. The nurses' abilities to communicate with their patient's foreign language was another factor to support their culturally competent care as a result of their daily private interaction with a multicultural neighbor or taking care of international patients at the hospitals (Gözüm, Tuzcu & Kirca 2015).

To date, several studies have investigated the connection between critical thinking and the writing skills of university students. The studies claimed that when the students' English writing skills improved their critical thinking skills developed and reached a very advanced level. In addition, the studies have highlighted the importance of developing the students' academic writing skills to achieve high levels of critical thinking skills (Chen 2017; Cook 2016; Leibold 2019). A descriptive qualitative study has been conducted on 65 nursing students through 11 focus group interviews in China. The study distinguished three main critical thinking themes: own thinking, searching for truth, and cultural influences (Chan 2019). She claimed, "If nurses have more time to think about what is going on, they could think critically about what they are doing. This would help to protect the safety of patients and to reduce the occurrence of medical accidents" (Chan 2019 P. 18). The study claimed that critical thinking abilities became an initial element for developing every person and have been considered as a significant factor in in developing individual personalities. Furthermore, Chan has emphasized the important connection between the level of the patients' quality of care outcomes and the nursing students' critical thinking level. In addition, she found that the nursing students' critical thinking level varies as a result of their previous preparation at their nursing educational institutions (Chan 2019).

Developing and finding an undergraduate nursing curriculum that is certain with its efficacy to build the nursing students' critical thinking abilities was very difficult to find (Cook 2016; Gözüm, Tuzcu & Kirca 2015; Leibold 2019). The main reason behind the inability to trust any nursing curriculum to develop the students' critical thinking skills was the inability to find a clear and reliable 'operational definition' for critical thinking today. Regardless of the huge efforts of many nursing faculties and university managements to produce the best nurses ever, they were not able to guarantee their students' critical thinking skills and competency to support their patients to secure their patients' optimal health. As an alternative, a great effort has been spent to develop a clear definition for critical thinking using measurable learning outcomes within the nursing curriculum through a conceptual analysis method. Cooke, Stroup and Harrington (2019) the result of their study found that there were constant and common characteristics and qualities that have been shared with the individuals who think critically. Therefore, the current study is exploring the development of the nursing students' critical thinking and moral reasoning within the UAE culture and following their progress in having respectable 'decision- making' abilities autonomously in the UAE healthcare field.

### **3.6 Health education, cultural sensitivity and social determinates of health**

Worldwide, the mal-distribution of living resources has been the major cause of every social injustice among different societies. Consequently, social justice (Hines-Martin & Nash 2017) with a fair distribution of equal medical healthcare treatments has been considered a very critical concept and essential need within the nursing profession (ANA 2015). Frenk and colleagues in (2010) stated, "Worldwide, 2420 medical schools, 467 schools or departments of public health, and an indeterminate number of postsecondary nursing educational institutions train about 1 million new doctors, nurses, midwives, and public health professionals every year. Severe institutional shortages are exacerbated by mal-distribution, both between and within countries" (p.1923). All members should have the same chances of resources economically, politically, socially besides any other health opportunity. Researchers emphasized the importance of having the same right to access the available healthcare facilities for all. Individuals should gain the best

medical treatments regardless of their socio-economic background (ANA 2015; Edmonson et al. 2017). In the coming days, the cost of healthcare will increase dramatically (Chen 2010; Edmonson et al. 2017; Frenk et al. 2010; Tseklevs & Cooper 2017). This massive increase in the healthcare cost originated from the increasing and aging population worldwide. As a result, a preventative approach at healthcare became a key concept that needs good attention from the community stakeholders. The healthcare management should put this issue at the top of their agenda to reduce the cost and decrease the burden of the diseases. Additionally, healthcare leaders need to focus on self-care, health management, person-centric healthcare, holistic healthcare and community healthcare (Tseklevs & Cooper 2017).

### *Quote*

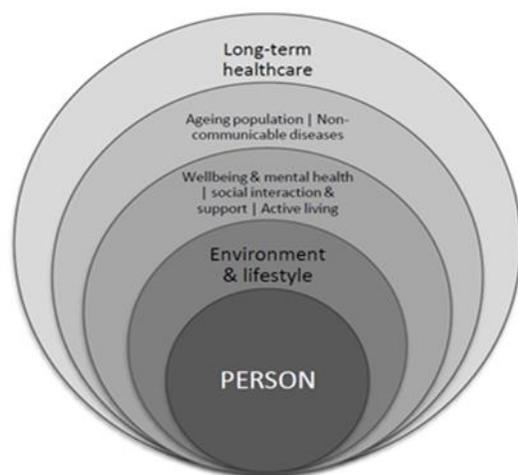
“You have a brain and mind of your own. Use it, and reach your own decisions.”

- Napoleon Hill

Originally, the healthcare professionals found many obstacles in adopting the social cognitive models for health education to educate their patients at their institutions. Instead, they requested to have newly developed models to use for their health education. At the same time, the nurses highlighted the importance of understanding people's complexity and diversity based on the other determinants that can interfere with any health behavior (Whitehead 2001). Another essential point, the implementation of the evidence-based practice starts with ‘prevention, early recognition, intervention and implementation of nursing practices in the healthcare environment. Moreover, using evidence-based practice to address any global health issue could be implemented smoothly with the support of the nurses in the health field. Nevertheless, the administrative support of the nurse leaders at the healthcare system is an essential element of success in identifying the existing global health issues and builds a trustable and a positive relationship among the healthcare teams (CNA 2009; Edmonson et al. 2017).

Environmental changes, inconsistent lifestyles, and dissimilar social interactions were the most effective determinates of health that could influence our mental health, aging process as well as controlling non-communicable diseases. Therefore, these diverse determinates should be considered in designing long-term healthcare institutions. Accordingly, every individual’s health behaviors should be shaped based on their physical, social, socio-economic and environmental

determinates (Tseklevs & Cooper 2017). The casual relationships between the challenges in healthcare is presented in figure 10 below. However, the WHO announced that ignoring these determinates will cause health to deteriorate and increase the spread of non-communicable diseases which killed 38 million people every year. Health promotion and disease prevention should be motivated through public awareness to stop using alcohol, tobacco and avoid physical inactivity by active and creative health professionals. Accordingly, the main goal of all healthcare systems needs to be increasing the quality of care and decreasing the mortality rate in every community (Alwan 2011; Tseklevs & Cooper 2017). Researchers suggested new visions for health based on the recent life-expectancy statistics to the coming community “The United Nations estimate that 1.4 billion people will be over 60 years old by 2030 (United Nations, 2016).



**Figure 10** Casual relationships between the challenges in healthcare. Adopted from (Tseklevs & Cooper 2017 p. S2262).

Another important finding came from Leffers and colleagues (2017) who had examined one of the determinates of health as they had focused on understanding the relationship between climate change and nursing education. The study examined the effect of the environmental changes on the people’s health in the reflection of political, cultural and economic correlation on human health and the entire planet’s health. Furthermore, the study confirmed that there was a significant positive association between integrating climate change into the nursing education curricula in the

modification, adaptation, and flexible strategies for the climate. Moreover, the researchers argued that this integration was essential to develop the students' knowledge, skills, and perceptions for clinical practices and adaptation during climate change. Finally, the study recommended extending the incorporation into curricula, practice, research, and policy. Additionally, the study claimed that integrating climate change into the nursing profession would help the world to address adverse health impacts, climate change responses policy, and advocacy roles.

In the more distant past, nurse educators had a great interest in studying the social and health inequalities to support the communities to overcome these challenges (Whitehead 2001). For a better understanding of the best nursing interventions to these challenges, they integrated the health and social inequalities to the nursing curriculum at the nursing schools. For example, Rozendo, Salas & Cameron (2017) conducted a critical review approach study of 20 articles that were published from the years between 2000 - 2015 to produce a baseline understanding of 'how inequalities are currently addressed in the nursing curriculum' in ERIC, CINAHL, Web of Science, Scielo, MEDLINE and LILACS databases. Most of the chosen articles were studying the nursing undergraduate curricula from the experiences in the United States undergraduate nursing education. The authors aimed to search for the main elements as 'social justice, cultural competence, cultural safety, and advocacy' to understand and identify the existing social and health inequalities. Most of the research articles recommended and focused on the importance of working on minimizing the social and health disparities within any community. The study was able to recognize three major themes. First, it identified the elements in the curricula that contributed to reducing the social and health inequalities. Second, to address inequalities the educational and research strategies that have been used to address inequalities. Finally, it focused on socially vulnerable populations to increase the awareness of social and health inequalities.

Baker and colleagues (2017) believed that the integration of the social needs of health within nursing practices could improve health outcomes. The researchers argued that critical factors such as social, ecological, political, commercial and cultural factors could influence peoples' health, and they called them determinants of health. In addition, the study suggested that the value of health could increase gradually if those determinates were utilized as a framework within the nursing curriculum. Likewise, Mendes and colleagues (2018) they conducted a quantitative study in nursing undergraduate education in Brazil. The study aimed to evaluate the extent to which the

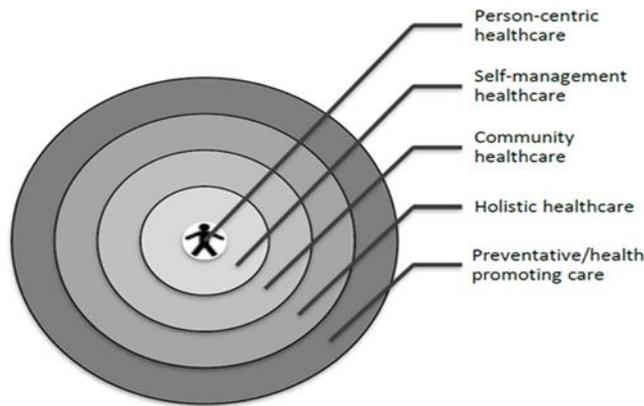
nursing faculties understand whether social determinants of health had an impact on health. The study examined 222 nursing faculty from Brazilian higher education concerning a questionnaire on 'Core Competencies in Global Health'. Randomly, the authors selected 20 schools (10 public and 10 private) nursing schools from each region of the country. The authors aimed to motivate the stockholders to promote the awareness of the social factors' positive impact on health among health care professionals. They also focused on the effect of the social determinants of health in the global health context. As a result, the authors declared that all the examined professors had agreed that the determinants of health should be integrated within every nursing school curriculum (Baker et al. 2017; Mendes et al. 2018).

The World Health Organization confirmed that identifying social and health inequalities in every society would help in discovering better health solutions. Furthermore, integrating them within the nursing education curriculum and practices could develop a better understanding of the disparities (Rozendo, Salas & Cameron 2017). Moreover, the Commission on the Social Determinants of Health (2008) recommended the health professionals to identify the social inequalities of the communities and study their impact on their health. They went on to highlight that that the existing social inequalities in every population were a result of the unequal distribution of societal resources. In addition, they had an unlimited negative effect on their working and living conditions. Community health inequalities refer to the unfair distribution of the health resources of that community to their population (Commission on the Social Determinants of Health 2008; Rozendo, Salas & Cameron 2017; WHO 2008).

Researchers argued that cultural competences should be integrated within the undergraduate nursing curriculum in different ways as theoretical modules, community-based participatory approaches, nursing diversity workforce grants, and other collaborative partnerships. Beside this, cultural workshops and cultural training programs could enable nursing students to develop advanced cultural safety skills at the end of these teaching and learning experiences. In addition, traveling abroad to gain international experiences and implementing the skills of supporting others through culturally competent care could help the students to develop their skills more. Then, the same study trained the nursing students to apply cultural advocacy and fight for the vulnerable, homeless, the poor and other racial issues within their community. Nevertheless, the researchers found that implementing interactive classroom approaches had proved to be a very effective

strategy to develop the nursing students' cultural competency skills. Subsequently, group discussions, debates, film clips, case studies, interdisciplinary seminars were the most popular teaching and learning strategies to increase the students' awareness of social and health inequalities. Finally, the study curriculum graduates demonstrated that they had decent cultural sensitivity skills and they became culturally safe to be engaged within any community later (Rozendo, Salas & Cameron 2017).

In short, researchers found that any local health problem could harm the overall world's health status and health safety. At the same time, health education leaders faced many challenges in directing and controlling the social determinates of health, as well as preparing safe health professionals with high standards. Accordingly, global health education leaders also planned a huge international health professional's cooperation to guarantee health equity among all nations. Besides, global health leaders had to ensure a healthy life status for all by having united solid strategies that can influence all of the community levels. Preventive healthcare was the immediate key challenging issue that required direct attention based on the recommendations of many studies. Accordingly, reforming the health curriculum could improve the students' critical thinking skills through a safe standard health educational environment. The health education curriculum was the most common cause of stress and uncertainty among the current health education systems in the UAE and worldwide. Nevertheless, the circle of emerging trends in design healthcare is presented I figure 11. The circle presents that social justice with a fair distribution of equal healthcare resources was considered a very essential need to provide holistic care and guarantee to cover the physical, social, socio-economic, cultural and environmental determents of health (Commission on the Social Determinants of Health 2008; Mendes et al. 2018; Rozendo, Salas & Cameron 2017; WHO 2008; Tseklevs & Cooper 2017).



**Figure 11** Circle of emerging trends in design healthcare. Adopted from (Tseklevs & Cooper 2017 p. S2264).

### 3.7 Nursing education reform

Mahmoud & Mohamed (2017) have shown that there is an urgent call from the current healthcare setting leaders to prepare the new nursing generations with high standard skills and ‘clinical reasoning skills’ that should be based on the students’ critical thinking abilities (Kaddoura 2017). These skills are needed to deal with the complexity of the healthcare settings and manage the increase in chronic diseases with their new complicated features (Frenk et al. 2010). Starting to apply this change has been highlighted by reforming nursing education (Thornton 2018), the current nursing curriculum and making sure that the students’ critical thinking development is adopted by the courses given at the nursing schools. In addition, other researches confirmed that the critical thinking of the nursing students could be developed and improved through college education with a well-planned curriculum (Kantek & Yildirim 2019).

“Nursing requires compassion, critical thinking, and communication. These qualities strengthen the trust people put in nurses, and make all proud to say, ‘A Nurse I Am.’”

-By Allison Williams

Moral education was investigated in many studies, cross-sectional research has been conducted on 204 baccalaureate nursing students at Alexandria University in Egypt. The study aimed to study the nursing students’ level of empathy for psychiatric and mental patients. The current study found

that empathy is an ability and skills that can be learned and developed through appropriate education, and clinical practices. In addition, this study recommended further researches to investigate the students' empathy level with relation to other factors such as patients' satisfaction in the context, student nurse-patient relationship, and students' clinical performance (Mousa 2015). Similarly, another study has been conducted aimed at testing the critical thinking abilities of Palestinian university students from three different professions: nursing, medicine, and information technology. The study found that critical thinking is a key learning outcome across the Middle East higher education and they had recommended further investigations on the same issue (Kabeel & Eisa 2016). At the same level of importance, the nursing educational leaders have argued that the patient's cultural assessment should be focused on during the nursing curriculum development and they called for reform to the nursing curricula based on the applications of the cultural knowledge (Jeffreys 2012). Besides, they directed the educational leaders to assure the contextualization of every nursing course for the fact of its influence on the patients' health as well as how it can foster the patient's recovery in the clinical areas (Jeffreys 2010; Fairweather 2011; Thornton 2018).

Distinguished safe 'nursing interventions' such as correct diagnosis of the patient's health issue and best nursing practices can be acquired through the appropriately established educational nursing systems that developed and updated their teaching strategies accordingly (Lee et al. 2016). With good critical thinking abilities, the students' stress and anxiety would lessen in different clinical situations (Rezaei et al. 2015). The nursing curriculum developers need to recognize that their students' critical thinking development will directly affect the student's accuracy scale that in turn will positively increase the students' confidence. Therefore, the CT teaching strategies should be functional within the curriculum to assure the patient's safety (Cruz, Pimenta & Lunney 2009; Lee et al. 2016; Kantek & Yildirim 2019).

Zoboli & Schweitzer (2013) have argued that the well-developed nursing curriculum will protect the students from being confronted with any unexpected clinical and moral distress. Another important finding was that moral reasoning became very important for the topic of nursing education. Accordingly, the UAE nursing students have been expected to face extra challenging moral distress because of the country's unique multi-cultural structure. Furthermore, the difficulties that could be seen in the clinical settings from the vast cultural and linguistic variations

called for culturally competent nurses. Consequently, the UAE nursing education leaders need to employ extraordinary efforts to design their nursing curriculum to include CT, moral reasoning and culturally sensitive skills (El Amouri, and O'Neill 2014; Mahmoud & Mohamed 2017).

Researchers have discussed the cultural awareness of the individuals and their families (Leininger 1995), and the active role of the nurses and the other healthcare providers in evolving transcultural obligations in any multicultural and multiethnic environment to provide culturally congruent care to every individual unique value, patterns, and expressions (Leininger 1993). Jeffreys & Zoucha (2017) called for urgent further investigations to deliver culturally congruent care for different multinational and multicultural individuals. "Understanding multiracial and multiethnic individuals can be considered the new phase of discovery in transcultural nursing and health care. Nurses and other healthcare professionals must see the world and the people in it as different to what they have come to understand. The challenge of transcultural health care is to demonstrate a richer understanding of multiracial, multiethnic individuals and families to promote culturally congruent care" (p.9).

The UAE's previous Minister of Higher Education and Scientific Research, His Highness Sheikh Nahyan Mubarak Al Nahyan, stated that "The most important priority in the 'UAE Higher Education' is to change from traditional pedagogy, to prepare students for a technological workplace, with competency in "independent learning," and the "ability to work as a team" (Gulf news 2020, paragraphs 12-14). UAE has been experiencing enormous competition among the nursing education universities to graduate their nurses to meet the expectations of the UAE multicultural community. However, nursing image, curriculum, and practice were the main factors that demotivate the UAE nationals from choosing a nursing career. Moreover, nursing education has been affected by variations determined by social, cultural, technological, and global economic powers. Accordingly, a qualified nurse should be trained on how to apply nursing care artfully mixing sympathy and empathy, caring, and respect to the client's privacy and dignity for individuals' culture. The scope of nursing practice has been extended with extra responsibilities for the nurses to act very professionally (Germov 2009; Gillespie & Peterson 2009).

Subsequently, all the efforts have been gathered to restructure the UAE nursing education to improve the independent learning and accommodate the existing encounters. For instance, the culturally competent care pedagogy (Jeffreys & Zoucha 2017) is required to enhance the UAE

cultural diversity context and support the new nursing generations to avoid any expected moral distress. However, empowering the nursing students with better self-confidence with enhanced clinical judgments became a mandatory goal for the nursing educational leaders. Consequently, there has been a great competition running among the UAE nursing educational institutions to verify the quality of their BS nursing curriculum (Leibold 2019) to the organization that regulates higher education and get their accreditation. For that, more studies required to reevaluate the UAE nursing curriculum and to assure the community that their nurses would be meeting the needed multicultural expectations (Fairweather 2011; Thornton 2018). The above challenges could be added to many other issues that would cause the retention increase within the UAE nurses'. However, Arabic culture and the UAE cultural values in particular have negative attitudes towards the nursing profession about the nursing career. The nursing careers have historically been considered 'low status' in the UAE and the other Arabic countries, making them a less valued career option, which is regarded as another demotivating factor that limited the nursing profession for years (Ellis &Hartley, 2002; Mahmoud & Mohamed 2017).

### **Critical thinking**

There are multiple definitions of critical thinking in different pieces of literature. First, critical thinking has been defined as "a process of purposeful, interactive reasoning, criticism and judgement about what we believe and do" (Fini, Hajibagheri, & Hajbaghery 2015, P.1). Meanwhile other studies identified nursing critical thinking as a contentious process of care to progress the patients' health outcomes (Leibold 2019). Moreover, it was defined as "purposeful, informed, outcome-focused thinking that is guided by standards, policies, ethics codes, and laws" (Alfaro-LeFevre 2017, p. 6).

Historically, researchers have investigated the elements associated with critical thinking. In 1941, Edward Glaser focused on three main elements of critical thinking: "attitude to consider problems and topics of knowledge/expertise thoughtfully; knowledge about methodology related to logical inquiry and reasoning; and some ability in the skill of applying these methods (Glaser, 1941). Glaser's (1941) findings are still fitting today!"(Leibold 2019, p. 18).

Ennis (2011) and Ennis (2019) discussed the dispositions of critical thinking and explained its three different categories. First, accuracy in finding various explanations, theories, resources, plans and conclusions to any issue. Accuracy required acceptance and open-minded thoughts to the other's points of view. Second, honestly in communication through active and focused listening to the other's opinions, views, reasons that could be verbal or written to have a clear conclusion to the total situation. Third, caring for every person within any situation was the final and the most important category (Leibold 2019). Critical thinking could be hard to find unless the person has some abilities that might enable him to be an ideal critical thinker (Ennis 2019).

Critical thinkers should have many abilities that have been listed by Ennis (2011, p. 1) as

1. Forming a question.
2. Analyze arguments.
3. Skimming a question to clarify or challenge a point, that includes the why, what, meaning.
4. Evaluate a source for credibility and considerable expertise, conflict of interest.
5. Observe and evaluate reports.
6. Evaluate deductive reasoning and logic.
7. Evaluate inductive reasoning or inferences.
8. Judge value statements.
9. Define concepts and evaluate the concept definitions.
10. Check assumptions.
11. Consider premises, reasons, assumptions, and propositions of doubt or disagreement with an open mind.
12. Assimilate the dispositions.
13. Use problem-solving skills, apply metacognition, and use a thinking checklist.
14. Apply emotional intelligence to be sensitive to the feelings and abilities of others.
15. Use organization in writing and speaking”.

Many research studies found that nurses have been requested to develop their critical thinking skills to enable them to advance their daily clinical judgments and improve their patient's health. For that, a process of many cognitive skills was needed to develop the nurse's decisions that include noticing, interpreting and responding to their previous knowledge and previous experiences (Pouralizadeh et al. 2017). Similarly, another study on critical thinking and nursing education had extensive focuses particularly on critical thinking attitudes and research utilization and barriers among nursing students in Scandinavia and Indonesia. They confirmed that every nursing school should work on developing their students' critical thinking to enrich their professional competences at their graduation (Wilde-Larsson et al. 2017).

On the other hand, the decision-making process has been considered a highly complicated process when it deals with the complexity of the patients and their families. Accordingly, critical thinking abilities would influence those complicated decisions taken. Many nursing research studies have found a boundless relationship between the nurses' critical thinking skills and the quality of the nurse's clinical decision-making that would reflect on the patients' health (Leibold 2019). According to Santovec (2013), there are seven steps to good decision-making:

1. Clarify the situation or problem.
2. Create a decision-making environment that is rich with integrity, the overall mission, and acknowledgment of priorities.
3. Generation of possible solutions.
4. Evaluation of possible solutions. This may require the use of asking additional questions or weighing the pros and cons of each solution.
5. Making the decision. Santovec (2013) explains this based on the use of logic, but intuition is also used.
6. Check the decision. Challenging assumptions is one way to check a decision. Santovec advocates team feedback to check the decision (2013).
7. Communicate and implement the decision. Be sure to evaluate the decision after implementation.” (Leibold 2019, p.25).

Concept mapping is a commonly used term in critical thinking. “Concept mapping creates a network of relationships among concepts and necessitates a reflection on the elements constituting every concept. Since students try to find relationships between concepts in the concept map, they

get a chance to practice and improve their critical thinking skills” (Mohammadi et al. 2019, p.1095). A study has been done to explore the effect of conceptual mapping on the development of nursing students' critical thinking skills in clinical settings. The study used the California Critical Thinking Skills (CCTS) Test Form B with 34 multiple-choice to evaluate the participants' critical thinking abilities. The (CCTS) Form B is used for testing the critical thinking of the high school graduates and above testing the students’ primary education away from any particular academic knowledge. The CCTS evaluates the students’ CT in five areas; ‘analysis, inference, evaluation, induction, and deduction. Correspondingly the test scores 1 and 0 were allocated to true and false responses. The reliability and validity of the questionnaire have been approved through the Persian version. Finally, the results of the study confirmed that education through conceptual mapping could not improve students' critical thinking skills (Mohammadi et al. 2019).

A large and growing body of literature has investigated critical thinking at the nursing schools. For that, many undergraduate nursing schools aimed to develop the critical thinking skills of their students over many years. A recent study has been conducted to assess the critical thinking skills of 176 students enrolled at two universities, the University of Colorado Boulder and Colorado College. The study tested the students’ critical thinking skills through using the Critical-thinking Assessment Test (CAT) in classes that focused on ‘critical thinking, civic engagement, or according to the class instructors neither was a point of major emphasis’ throughout the first and last weeks of the term. Consequently, the study pointed out that CAT could be an effective tool to assess the nursing students’ critical thinking abilities and could be used by other colleges of higher education (Grant & Smith 2018). Moreover, other researchers have highlighted the importance of critical thinking abilities as an indicator for accessing the baccalaureate nursing education study abilities (Li, Ye & Chen 2019).

A considerable amount of literature has been published on critical thinking and emotions. These studies have shown a significant relationship between empathy and critical thinking skills in nursing education. The studies found that the nursing students had developed a very close relationship with their patients after using these two elements at nursing education as teaching techniques. Empathy and critical thinking skills resulted in improving and empowering nursing students to care for their patients (Bagheri & Heidari 2018). A recommendation has been specified by the academics to include emotional intelligence in most of the nursing educational subjects to

investigate the critical thinking abilities of the nursing students. The study has found that the more the students debated over the criticisms and discussed any issue from different aspects, the more they could develop both their emotional intelligence and critical thinking abilities. Accordingly, the study found a great development in the students' quality of work in correlation with the effect of the other factors as emotional intelligence, critical thinking, self-motivation, clinical decision-making, reasoning ability, adoption of evidence-based practice and practice-based knowledge (Kaya, Şenyuva & Bodur 2018). This is in contrast to another descriptive correlational study that has been conducted in Saudi Arabia that aimed to examine all the undergraduate nursing students' emotional intelligence and critical thinking disposition. A convenient sample of 300 nursing students studying in Jeddah- Saudi Arabia at the College of Nursing- Jeddah and King Saud bin Abdul-Aziz University for Health Sciences had participated. The tools used were the Emotional Intelligence Scale and Critical Thinking Disposition Scale respectively to test the students' emotional intelligence and critical thinking. Accordingly, the study claimed that emotional intelligence was significantly correlated to critical thinking disposition and it was more developed with the academically advanced students. Furthermore, that rare study claimed that Saudi nursing students' quality of patient care and problem-solving skills improved after developing their critical thinking and emotional intelligence abilities as they became open-minded and learned from their previous experiences (Abou Hashish & Bajbeir 2018).

A literature review was undertaken by searching the EBSCO database: CINHALL, Eric and Medline, and Cochrane databases as well as Google Scholar, using the search terms: 'critical thinking', 'clinical judgments', 'critical thinker', 'problem solving', and adding 'nursing', 'education', 'nursing educational institutions', 'nursing educational strategies'. The initial search ended up with 948 different articles. These articles went through skimming and scanning of the abstracts and the conclusions of the articles for filtering the needed articles. This resulted in reducing the search result to 31 internationally published articles. Then the search was limited again to the articles that were published between the years 2010-2019 to make sure that the reviewed findings were up to date and assure the reader that the reviewed outcomes were very recent to the nursing education and were relevant to the nursing education field in general. Furthermore, two books were hand searched to provide this review with the topic of background information.

Then, a final inclusion and exclusion criteria were applied to reduce bias in selecting the articles and limit the search results to those that are directly related to this literature review. For that, the research articles published between 2010 and 2019, peer-reviewed articles written in the English language, and research-based literature were included. The selected research studies were also included if they focused on critical thinking and nursing students as well as nursing education and clinical judgment. On the other hand, the articles excluded met the following exclusion criteria: studies investigating critical thinking of the postgraduate nursing students, articles and studies that dealt with the nursing critical thinking at the clinical setting after gaining the clinical experience away from an educational background, the non-peer reviewed articles, and finally the non-published studies.

As a result of the above pre-planned selection criteria, the search ended by using 25 peer-reviewed published research-based articles in the above selected period and that are presented in table.1. However, 2 research articles were added to the study based on their significant findings that would contribute final findings of the current study although they were excluded from the first search. The first one was testing the CT of the nurses at the hospital. Professional nurses were excluded from the search criteria but this particular article used the 'California Critical Thinking Skills Test' that was commonly used to test the student's CT by others. The second one used the same test but for Nursing Diploma programs students in UAE and the study was significant as it related to the country of interest.

Alharbi (2019) argued that 'No significant increase in the nursing student's critical thinking skills after their exposure to the simulation experience. No increase on the grades of nursing students after simulation. The sample size was limited. Recommendations for larger further research studies to validate the effectiveness of simulation in improving the critical thinking skills and decreasing the attrition rates. Another limitation was the lack of a control group due to the small sample size that can give a comparison data to enable analysis of the real influence of simulation experience on students' critical thinking'. However, 'Nursing education and students should employ critical thinking to assure quality and safety of patient care. If nurses have more time to think about what is going on, they could think critically about what they are actually doing. This could assure safety of patients and reduce medical accidents. Recommended for future studies to be conducted on how these factors might affect critical thinking' (Chan 2019). Another study

in the same year found that ‘the results of the study indicated that nursing students were not able to develop their critical thinking skills and that there is a need for implementations to develop their critical thinking skills. This study will provide guidance for nursing school administrators and educators to develop critical thinking skills of nursing students’ (Kantek & Yildirim 2019).

In addition, the “nursing case-based learning” was an effective course to develop the critical thinking abilities of nursing students. Strict instructional design was the guarantee for the smooth implementation of “nursing case-based learning” course. Moreover, ‘There were no significant differences between genders for caring behavior, critical thinking skills or gender role orientation. Understanding gender roles could help nurse educators have more effective teaching methods and contribute to future definitions of caring. The results were consistent with previous research. However, nurses who reported higher femininity presented higher caring behaviors. Masculinity was a positive interpreter for critical thinking. Therefore, the student’s gender role is the predictor of caring behavior or critical thinking not the sex. Future studies should utilize a longitudinal sample from a different nursing population’ (Kantek & Yildirim 2019). While Kantek and Yildirim (2019) declined that, ‘No significant difference between the mean critical thinking scores of the two groups. Post intervention values increased in both groups, but the mean critical score was significantly higher in the intervention group’. Conversely. Another study found that ‘Concept mapping led to a greater improvement in the nursing students' critical thinking skills compared to those exposed to the routine approach’(Li, Ye & Chen 2019). Never the less, ‘Fostering emotional intelligence and critical thinking disposition among nursing students would enhance their problem-solving skills and judgment abilities which in turn, lead to providing more qualified clinical services. Further study should be preceded as a longitudinal design because the development of both skills requires a long time’ (Harrison 2019). Further findings are presented at the below summary tale.

This literature review discussed the three common themes that have emerged from the used articles. To be precise they are professional identity and CT student characteristics, accuracy in clinical decision -making effects on the patients’ outcomes, and instructional teaching strategies. All of these will be discussed deeply in the coming sections in table 1 below.

Table .1: Summary (included research studies).

Authors	Topic/purpose	Methodology	Sample	Data collection methods	Conclusion & Recommendations
(Alharbi 2019)	‘Using Simulation in Nursing Didactic Classes to Enhance Students’ Critical Thinking and Knowledge’	‘Empirical study’	‘39 nursing students at the Indiana University Kokomo (IUK) campus’	‘The Watson Glaser Critical Thinking Appraisal II (WGCTA) measured the contributors’ critical thinking pre and post simulations. The National League of Nursing Student Satisfaction and Self-Confidence in Learning Survey used to measure students’ satisfaction and self-confidence after the simulation sessions’	‘No significant increase in the nursing students critical thinking skills after their exposure to the simulation experience. No increase on the grades of nursing students after simulation. The sample size was limited. Recommendations for larger further research studies to validate the effectiveness of simulation in improving the critical thinking skills and decreasing the attrition rates. Another limitation was the lack of a control group due to the small sample size that can give a comparison data to enable analysis of the real influence of simulation experience on students’ critical thinking’.
(Chan 2019)	Nursing students' view of critical thinking as ‘Own thinking, searching for truth, and	A descriptive qualitative study. Aimed to explore the perspectives of nursing students on	65 nursing students from one school of nursing. A focus group study, semi-structured interviews	Eleven focus group interviews were conducted in Chinese and translated into English. Thematic analysis has been adopted.	‘Nursing education and students should employ critical thinking to assure quality and safety of patient care. If nurses have more time to think about what is going on, they could think critically about what they are actually doing. This could assure safety of patients and reduce medical accidents.

	cultural influences’	critical thinking.			Recommended for future studies to be conducted on how these factors might affect critical thinking’.
(Kantek & Yildirim 2019)	The Effects of Nursing Education on Critical Thinking of Students: A Meta-Analysis	Meta-analysis followed the guidelines proposed by PRISMA standards of quality for reporting meta-analysis.	‘The literature screening was carried out in online databases using the keywords “nursing”, “student”, “critical thinking”, “Turkey Quantitative studies matching the inclusion criteria were included in the study’.	‘The number of the participants in those studies was 3792 (2183 first-year students and 1609 last year students). For the analysis of the data, the CMA (Comprehensive Meta-Analysis Software) statistical package program was used. While the Q and I2 tests were used to test the homogeneity of the studies, the Classic Fail-Safe N test and Kendall’s Tau were used to test their publication bias. Fixed and random models were used to calculate the effect size’.	‘The results of the study indicated that nursing students were not able to develop their critical thinking skills and that there is a need for implementations to develop their critical thinking skills. This study will provide guidance for nursing school administrators and educators to develop critical thinking skills of nursing students’.
(Li, Ye & Chen 2019).	Practice and effectiveness of “nursing case-based learning” course on	A comparative study. Aimed to explore the effect of	80 nursing students. 40 students for the experimental group who	There are no statistically significant differences between two groups in the pre-test thinking abilities	The “nursing case-based learning” was an effective course to develop the critical thinking abilities of nursing students. Strict instructional design was the guarantee for the smooth

	nursing student's critical thinking ability: A comparative study.	“nursing case-based learning” course on the critical thinking ability of nursing students.	selected “nursing case-based learning” course. The control group included 40 students who selected the traditional teaching course.	.After nine weeks; the critical thinking abilities of the experimental group were significantly higher than control group. Three obtained time-points had statistically significant differences of control and experimental group.	implementation of “nursing case-based learning” course.
(Harrison 2019)	Student nurses' gender role is a predictor of caring behaviors and critical thinking	‘A cross-sectional design aimed to explain the relationship between gender role orientation, caring behavior and critical thinking in nursing students’	‘A convenience sample of 449 nursing students of four Universities in Taiwan’	‘Three instruments were used in the questionnaire to assess perceptions of critical thinking and skills (The Taiwan Critical Thinking Disposition Inventory), caring behavior (caring assessment report evaluation Q-sort scale) and sex-role orientation (Bem Sex Role Inventory)’.	‘There were no significant differences between genders for caring behavior, critical thinking skills or gender role orientation. Understanding gender roles could help nurse educators have more effective teaching methods and contribute to future definitions of caring. The results were consistent with previous research. However, nurses who reported higher femininity presented higher caring behaviors. Masculinity was a positive interpreter for critical thinking. Therefore, the student’s gender role is the predictor of caring behavior or critical thinking not the sex. Future studies should utilize a longitudinal sample from a different nursing population’.

(Mohammadi et al. 2019)	The effect of education through conceptual mapping on critical thinking of nursing students	‘The quasi-experimental case-control study. To determine the effect of conceptual mapping on nursing students' critical thinking’	‘Convenience sampling ‘Students were randomly assigned to intervention and control groups at the University of Medical Sciences, Shiraz, Iran, and comprised students of Fatemeh-Zahra School of Nursing and Midwifery, Shiraz’	‘Two-part questionnaire, including demographic items and California Critical Thinking Skills Test (CCTS) Test Form B. Both groups underwent 24 six-hour training sessions 3 times a week. The intervention and control groups were trained by conceptual map and integration methods’	‘No significant difference between the mean critical thinking scores of the two groups. Post intervention values increased in both groups, but the mean critical score was significantly higher in the intervention group’ ‘Concept mapping led to a greater improvement in the nursing students' critical thinking skills compared to those exposed to the routine approach’.
(Abou Hashish & Bajbeir 2018).	Emotional Intelligence among Saudi Nursing Students and Its Relationship to Their Critical Thinking Disposition at College of	A descriptive correlational research	‘A convenient sample of all Saudi nursing students (N=300) studying at College of Nursing-Jeddah (CON-J), King Saud bin Abdul-Aziz	‘Emotional Intelligence Scale and Critical Thinking Disposition Scale’	‘Fostering emotional intelligence and critical thinking disposition among nursing students would enhance their problem-solving skills and judgment abilities which in turn, lead to providing more qualified clinical services. Further study should be preceded as a longitudinal design because the development of both skills requires a long time’.

	Nursing- Jeddah, Saudi Arabia		University for Health Sciences, Jeddah, Saudi Arabia’.		
(Grant & Smith 2018).	Quantifying Assessment of Undergraduate Critical Thinking	Comparative statistical analyses of students' performance on CAT by class type and institution as well as conducting more fine grained analysis of some specific components of critical thinking.	176 students enrolled at two universities, the University of Colorado Boulder and Colorado College.  To explore the effects of different pedagogical strategies for classes on critical thinking skills at these two very different institutions	using the Critical- thinking Assessment Test (CAT) in classes that focusing on ‘critical thinking, civic engagement, or according to the class instructors neither was a point of major emphasis’ throughout the first and last weeks of the term.	The study pointed out that CAT could be an effective tool to assess the nursing students’ critical thinking abilities and could be used by other colleges of higher education.
(Hasanpour, Bagheri & Ghaedi Heidari 2018).	The relationship between emotional intelligence and	A quantitative, descriptive– correlative study	‘169 nursing students to investigate the relationship between emotional intelligence	‘California Critical Thinking Test (form B) and Bar-On Emotional Intelligence Questionnaire’	‘Pearson correlation test showed no significant correlation between the total score of critical thinking skills and each of its components with the total score of emotional intelligence and its component,

	critical thinking skills in Iranian nursing students		and critical thinking in nursing students’.		except for empathy (p=0.001), in nursing students. A significant relationship between empathy and critical thinking skills in nursing students. Using these elements as teaching techniques for nursing education courses can be very helpful in developing good nurse-patient relationships and improving patient care’.
(Kaya, Şenyuva & Bodur 2018)	The relationship between critical thinking and emotional intelligence in nursing students: A longitudinal study	A longitudinal design. Aimed to investigate nursing students' critical thinking dispositions and emotional intelligence as an essential skill, over the course of the undergraduate nursing program.	‘182 nursing students. Asymmetrical cluster sampling method has been applied to select the sample group and all students in their first academic year’.	‘California Critical Thinking Disposition Scale and Emotional Intelligence Assessment Scale were used. The data was analyzed by using frequency, standard deviation, Kruskal Wallis and Bonferroni test’.	‘There was no relationship between sub-dimensions of emotional intelligence respectively; awareness of emotions, empathy, social skills in the first academic year and critical thinking disposition and the end of academic year. A moderate correlation was found in the positive direction between the self-motivation at the beginning of the academic year and critical thinking disposition at the end of the final academic year. Recommendation that the nursing scholarship investigate the current issues on the subjects of emotional intelligence and critical thinking in detail, discuss different aspects of the subjects and debate over the criticisms. Briefly, the discussion should go

					beyond the scope of nursing and include different aspects’.
(Wilde-Larsson et al. 2017)	‘Critical thinking, research utilization and barriers to this among nursing students in Scandinavia and Indonesia.’	Descriptive analyses, comparisons between and within groups	‘Data were collected at the beginning, middle and end of education from nursing students in Norway, Sweden and Banda Aceh’.	‘Critical Thinking and Research Utilization Questionnaires were used along with the Barrier Scale. to describe and compare perceptions of critical thinking, attitudes to and availability of research, research utilization and barriers to this among nursing students in Scandinavia and Indonesia’	‘No differences were found between the samples regarding research utilization. Teachers must support nursing students to strengthen their critical thinking ability and develop professional competence’.
(Mahmoud & Mohamed 2017)	‘Critical Thinking Disposition among Nurses Working in Public Hospitals at Port-Said Governorate’	Descriptive research sudesign	196 nurses	‘California Critical Thinking Disposition Inventory(CCTDI)’	‘The study showed that $\frac{3}{4}$ of the nurses were not truth- seekers besides they are not sure about their critical thinking skills. The study recommended raising up the CT and problem-solving awareness in the clinical setting using updated teaching strategies for better patient’s health outcomes’.

(Huang et al. 2016)	'A multi-site study of strategies to teach critical thinking: 'Why do you think that?''	'Qualitative study'	'44 lecturers from 8 universities'	'Semi-structured interviews/ online screening survey'.	'The teaching faculty recommended enhancing the students 'cognitive and metacognitive' thinking levels by asking them more questions and direct them through hints to link their theoretical knowledge to their clinical experiences. Teaching critical thinking needs the cooperation of students, teaching staff and the institutions. Graduating the students with respectable CT skills will label them to be highly recognized and more professional than other nurses in the field'.
(Jacobs et al. 2016)	'Addressing the Challenge of Developing a Conceptual Definition for Clinical Judgment'	'Qualitative study'	23 articles	Centralizing review'	'The theoretical definition of the terms: 'critical thinking, clinical reasoning and clinical decision making in nursing' can be used interchangeably to evaluate the students' thinking process in nursing education. The main goal of the nursing educational leaders were directed to utilizing these terms to improve the student's clinical judgment skills'.
(Babamohamadi et al. 2016)	'A Comparative Study on	Quantitative study	'123 nursing students	cross-sectional study	'The analysis and the critical thinking skills were very limited within the nursing students at all

	Critical Thinking Skills of Bachelor and Master's Degree Students in Critical Care Nursing'		79 BSc nursing students and 44 MSc in 3 Universities'		levels although it was more advanced at the BSc level. Recommendations on improving the educational strategies at the nursing educational systems by emphasizing the classroom 'conceptual learning', critical reasoning and critical thinking skills'.
(Rezaei et al. 2015)	'Anxiety and Critical Thinking Skills in Nursing Students'	'Descriptive analytical Study'	'245 nursing students'	'cross-sectional Study'  'questionnaire, Watson-Glaser Critical Thinking Appraisal (A) and Spielberger's State Anxiety Inventory'	'The nursing students displayed a very low capacity on their critical thinking skills and that was correlated with the student's anxiety level. The more they were stressed the fewer abilities' of critical thinking appears. Great recommendations were given to work on the applied educational strategies to enhance critical thinking and reduce the student's anxiety to be ready for the current hospital's complexity'.
(Azizi-Fini, Hajibagheri & Adib-Hajbaghery 2015)	'Critical Thinking Skills in Nursing Students: a Comparison Between Freshmen and	Quantitative research	150 undergraduate freshmen and senior nursing	comparative study  'Questionnaire/ California Critical Thinking Skills Test, form B'.	'The nursing students critical thinking skills' were obviously very low from the start of their nursing study at the University. They did not show any improvement or progress over the studying years at the nursing program. The study recommended assessing the

	Senior Students'				students' progress over a long period through longitudinal research at the University to assess the student's critical thinking development deeply. Intensive curriculum reforming to adopt active learning and provide a professional development training sessions were required for the teaching staff to train them to utilize the CT in their teaching strategies.
(Moattari et al. 2014)	'Clinical concept mapping: Does it improve discipline based critical thinking of nursing students?'	Empirical study	32 year 4 nursing students.	'quasi-experimental study (post-test only design'	'The study recommended the use of the 'clinical concept mapping based on the nursing process ' to stimulate the brain to think critically till it becomes a habit of the nursing students at their early stages of learning in the clinical settings. Also, they recommended using it as a tool to measure the student's critical thinking at the clinical'.
(Ko & Kim 2014)	'Effects of Multi-mode Simulation Learning on Nursing Students' Critical Thinking Disposition,	Empirical study	'65 nursing students Exp.(n=33) Cont.(n=32)'	'Quasi-experimental study nursing students studying 'Emergency and critical nursing course at N university'. nonequivalent	'Multi-mode Simulation' influenced the nursing students' clinical nursing skills and enhanced their problem-solving abilities but it had a minor effect on their clinical thinking nature. Recommendations on improving the teaching strategies in classrooms rather than using the

	Problem Solving Process, and Clinical Competence’.			control group and a pre-test- Post-test design: >treatment group 33 students in 2010. >control group 32 students in 2011’.	‘Multi-mode Simulation’ for its economical and physical necessities have been elaborated by the study’.
(Burns et al. 2013)	Critical Thinking in Nurse Anesthesia Education: A Pilot Study	‘A quantitative comparative pilot study’  ‘The purpose of this study was to determine critical thinking ability of two groups of students in a nurse anesthesia Program’.	‘Two groups of nurse anesthesia students at one private health sciences university to determine if a difference in critical thinking ability existed between the two curricular points (beginning of the academic curriculum and one year following entry into the	‘The Health Sciences Reasoning Test (HSRT) (Insight Assessment, n.d.) 33 question well-established on-line assessment specifically designed for health care professionals over 50 minutes’	‘No statistically significant difference in critical thinking ability for students at two distinct curricular points. This result surprised the investigators’ ‘Critical thinking would naturally improve similarly for all students after 12 months of classroom instruction’. ‘Future studies will longitudinally examine one cohort at three distinct curricular points including the beginning and end of the academic year as well as completion of the 15-month clinical practicum’.

			academic curriculum). included 47 subjects out of a possible 54, 25 from Group 1 and 22 from Group 2’		
(Park et al. 2013)	‘Practice-based simulation model: a curriculum innovation to enhance the critical thinking skills of nursing students’	Qualitative research paper	‘Describing the (PBSM) Model fine elements as a pedagogical framework for the nursing education’.	‘Scholarly paper: Describing the Practice-Based Simulation Model (PBSM) to be used as an educational framework for integrating the simulation as a tool to assure developing the nursing students’ critical thinking skills as a main aim of the educational learning strategies’.	‘Constructivists supported the use of the ‘Practice-Based Simulation Model’ to reform the nursing teaching strategies. They found this model to be a good way to assure the development of the CT of the nursing students. They perceived that the more they implemented the CT within the nursing curriculum the better learning outcomes they gain and innovate better nursing competences. The five essential elements of the model were ‘practice situation, simulation, structured learning, inquiry process, and assessment’. These elements are designing a clear educational framework that can be implemented in the nursing curricula to assess the students’ knowledge in a systematic and constructive way. The study

					<p>elaborated that the PBSM is an active integration of simulation and a key factor that can improve any educational curriculum’.</p> <p>‘The authors declared: “that simulated learning experiences need to be integrated into a curriculum underpinned by sound pedagogy, such as the PBSM, in order to ensure that learning facilitates the development of the critical thinking abilities deemed essential for nursing” (Park et al. 2013, p. 49).</p> <p>Since 2010 the PBSM is considered the most common clinical educational framework at the nursing educational institutions that have been used in various nursing posts and undergraduates’ educational systems. Its reputation came from its flexibility and efficacy for the ‘simulation integrated teaching’ and ‘learning practice’ and enhancement of the nursing students’ critical thinking. The authors recommended a longitudinal study to link the</p>
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					simulation and the CT correlation in a way to evaluate the PBSM.
(Victor-Chmil 2013)	‘Critical Thinking Versus Clinical Reasoning Versus Clinical Judgment’.	‘Qualitative study’	29 studies	‘review literature’	For better nursing practices and judgments, preparing professional nurses who are utilizing their ‘cognitive, metacognitive, psychomotor, and affective processes’ efficiently through clinical thinking and clinical reasoning at their clinical settings. Proper educational strategies are needed to apply the change in using the critical thinking of the students and improving the assessment tools used in measuring that change.
(Nirmala & Shakuntala 2011)	‘Concept mapping – an effective tool to promote critical thinking skills among nurses’.	Empirical study	‘8 groups/ 5 members= 45 students’	‘Quasi-experimental Study’  ‘First a tool of ‘32 multiple choice questions’, then followed with a ‘concept mapping lecture for the experimental group pre-assessment, then the ‘Experimental group’ 8 groups/ 5 members.	Although the used assessment tool was very advanced and the students scored poorly, the study results illustrated great improvements among the nursing student’s critical thinking. Revision for the used tool and more studies on concept mapping were recommended. Promoting the students’ CT should be the concern of the nursing educational institutions. Revolution in that field should be the major concern for the educational leaders. ‘Concept

				Both 'the experimental group and control group' critical thinking were evaluated for the second time by the same tool'.	mapping' was one tool for that reason.
(Kaddoura 2011)	'Critical Thinking Skills of Nursing Students in Lecture-Based Teaching and Case-Based Learning'	Quantitative research	103 nursing students (N = 65)CBL (N = 38) traditional	'a comparative descriptive survey./ California Critical Thinking' Skills Test (CCTST) Form B	Diploma programs in the UAE for nursing students who went through the two ways of learning strategies the classical lecture based way beside the CBL in group-shared activities. The study presented that the CT skills of the nursing students were improved effectively through the CBL. The study results have great implications on both nursing education and health care professional research. The author concludes, "that CBL should be encouraged in the nursing curricula to develop the learners' CT, which might impact nursing care to improve patient outcomes". (Kaddoura 2011, p.15)

(Kaddoura 2010)	'Effect of the Essentials of Critical Care Orientation (ECCO) Program on the Development of Nurses' Critical Thinking Skills'	Exploratory qualitative descriptive	'8 nursing fresh graduates at their last year training'	'questionnaires and semi-structured interviews'	'A positive influence on the student's critical thinking came as a result of using the ECCO program by improving and increasing their theoretical knowledge among most of the participants. Few students felt that it has limitation for their critical thinking because of not having their teachers or peers around to elaborate on the theory part and have further discussions. The main aim of any nursing educational institution is to provide safe, critically thinking nurses to deal with the critical cases at the hospital like ICU patients. Such orientation programs can help in improving the CT of the nurses that will be the reason to maximize the rate of retention and staff burnout and increase their job satisfaction. Developing the nursing students CT will help in controlling the global nursing shortage in the hospitals through better recruitment and orientation training nursing programs.'
(Kaddoura 2010)	'New Graduate Nurses'	Exploratory qualitative descriptive	'10 fresh BCs	'demographic questionnaires and	The hospital setting provides an advanced 'clinical simulation center' for the students which is

	<p>Perceptions of the Effects of Clinical Simulation on Their Critical Thinking, Learning, and Confidence’</p>	<p>design’</p>	<p>nursing graduates’</p>	<p>Semi-structured interviews and were analyzed using content analysis’.</p> <p>The sample of the students were selected to be trained at the biggest free educational hospital in USA.</p>	<p>training them in a special high quality and advanced nursing care skills programs. All of the student’s critical thinking skills were improved at the end of the training program. The simulation lab influenced the student’s critical thinking skills and improved their relations with the health team staff after knowing how to communicate effectively and professionally. Moreover, the students’ stress level became less after this simulation-training program with clear progress and improvements in their leadership management skills with evidence of supporting and non-threatening teaching environment. Mutual training with other nurses at the simulation program in one specialty improved the student’s clinical competencies within a teamwork manner. There was a significant improvement in the patients’ health outcomes in the critical areas. The study recommended the educational leaders to reform the nursing educational curricula by adopting the ‘simulation as a teaching-learning strategy’.</p>
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## **Chapter 3: Methodology**

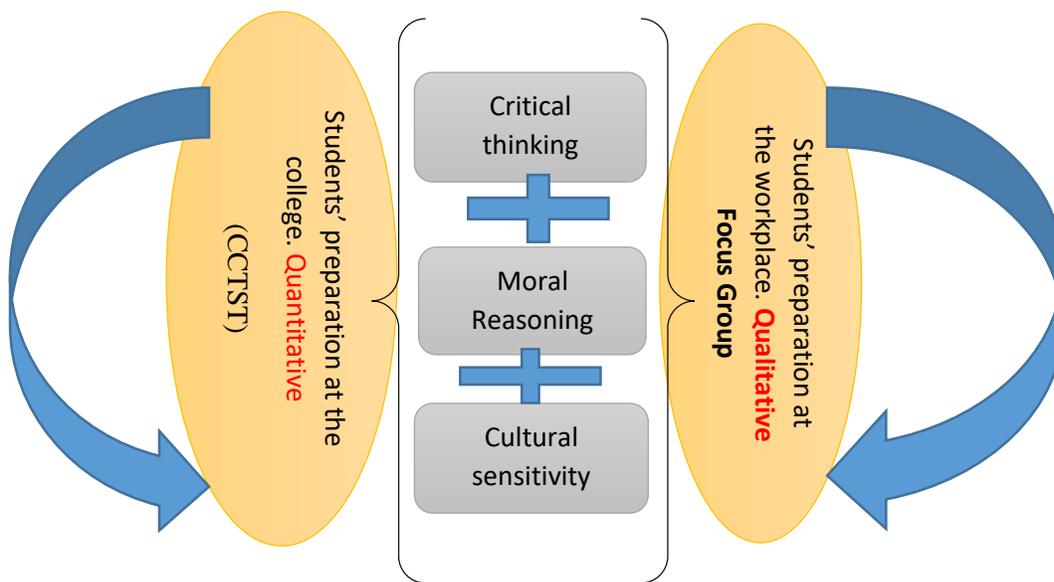
This research is a concurrent mixed study carried out at BSc nursing colleges in the United Arab Emirates (UAE) that implement critical thinking skills within their curriculum. The main purpose of this study was to investigate the impact of the nursing education curriculum and the workforce preparation on students' critical thinking (CT) and moral reasoning (MR) skills within the BSc nursing curriculum and examine the quality of clinical decision-making among the UAE nursing students within culturally competent care. Accordingly, this chapter presents the methodology of the study, the data collection with other important methodological procedures and related data will be provided in this chapter

This chapter will provide a full, detailed and transparent overview of the research design including the research paradigm along with explanation of the study's validity and reliability. Next, an in- depth outline of the core research approach and theoretical and systematic analysis of the methods adopted will be given. Then, a detailed description of the participants, sampling, study site, and the tools used for the study data collection will follow.

### **3.1 Research Approach**

A mixed-method research design with both qualitative and quantitative data collection techniques was utilized in this study. Based on the purpose of the study, the need to use both qualitative and quantitative data is supported by pragmatic philosophy (Johnson & Christensen 2014). Many researchers were inspired to move from the traditional qualitative and quantitative research styles to adopt the new mixed paradigm approach after it proved its validity and reliability over the past twenty years. This shift came about because of the huge criticism of the quantitative positivist paradigm by several social scientists who preferred constructivism in qualitative researches (Tashakkori & Teddlie 2010; Reichhardt & Rallis 1994). Accordingly, many researchers worked to find the best solution for psychological, cultural and social issues over the past several years. However, they have utilized mixed methodology as it worked to find middle ground solutions based on real experiences and after understanding the people's different perspectives (Johnson & Christensen, 2014). The purpose of this concurrent mixed study was to

investigate the existing critical thinking and moral reasoning skills within the BSc nursing curriculum and examine the quality of clinical decision making among the UAE nursing students within culturally competent care. Therefore, efforts were directed to answer the two proposed research questions. First, the quantitative method was used to investigate the extent to what impact does the nursing education curriculum have on three different nursing cohorts (undergraduate students, internship, and graduate) in terms of critical thinking, moral reasoning, and cultural sensitivity in the UAE?. Second, a qualitative method was deemed most appropriate to examine what influence the workplace preparations have on the students’ performance in critical thinking, moral reasoning and cultural sensitivity in the UAE. The overall map design of the mixed-method study that presented both methods the qualitative and quantitative data collection techniques was utilized in this study is represented in Figure 12.



**Figure 12** Overall, map design of the study.

Kuhn (1962) has defined the paradigm as an “accepted model or pattern” (p.23), that can direct the researchers to have a clear philosophical base to structure and connect their findings within any social context to understand and relate those social phenomena”. In more depth, Kuhn mentioned that “a paradigm directs research efforts, it serves to reassert itself to the exclusion of

other paradigms and to articulate the theories it already established” (Kuhn 1962, p. 24). Others describe the paradigm as a framework for the study. Neuman (2006), for example, stated that a paradigm is a ‘general organizing framework for theory and research that includes basic assumptions, key issues, models of quality research, and methods for seeking answers’ (p.81). For that, many researchers agreed that at the very first stages of any research study it is important to choose and follow a paradigm that is driven by philosophical assumptions to direct the researcher’s efforts, interpret then narrow the research methods and exclude the rest. In addition to the fact that the researcher created a philosophical background to his research, the paradigm can increase the researcher’s creativity to fulfill his interest in studying any social phenomena (Collins 2002; Creswell 2003; Creswell 2010; Creswell & Plano Clark 2011; James 2000; Kuhn 1962; Teddlie & Tashakkori 2010).

Mixed research is research that uses multiple paradigms to profit from both qualitative and quantitative strengths and to overcome the individual weaknesses of using either method (Johnson & Christensen, 2014). The incorporation of quantitative and qualitative methods can be used through diverse forms such as; merging data, connecting data, and embedding data (Creswell & Plano Clark, 2011). This pragmatism (mixed research) has been supported by the dialectic pragmatism philosophy that is interested in understanding different perspectives when they need to find solutions for any issue during their research processes. The pragmatism believes that it is valuable to find altered solutions to fit every member within any community or provide the same individuals more than one workable solution (Johnson & Christensen, 2014). Pragmatism being practical to every context of social research for daily issues that have been associated with mixed-methods inquiry. Dewey's philosophy suggested that pragmatists would identify real-life problems that are part of actual social situations. Meanwhile, reflection is to connect the students' previous experience, knowledge, and ideas (Dewey, 1910) and students' interests, addressing human problems, integrated subjects (Dewey, 1934). Dewey (1907) claimed that the students' preparation to know how to deal with social problems in the classroom would develop their social interaction at their broader society. This integration developed the student's critical reflection, enhanced their skills to solve real-life problems, self-discipline, and increased their collaboration in their community (Dewey 1907; Dewey 1997). The curriculum that focused on guiding students through solving problems and transformation of learners' experiences form the conception of integration at

the personal level where the students should actively engage in inquiry and experience the subject matter (Dewey, 1933; Dewey, 1907). Researchers have suggested that priority, implementation, integration, and theoretical perspective are the main principles to follow within mixed research studies (Creswell 2003). Several steps (appropriateness of the mixed-design, rationale, sampling design, constructing the research design, analyzing data, validating data, interpreting findings, and writing the final report) have been suggested by Johnson and Christensen (2014) to use in mixed research, and have been utilized in this study. Accordingly, this study of the CT, MR and cultural sensitivity as a social phenomenon in the United Arab Emirates (UAE) followed a concurrent mixed study approach to answer the research questions.

Moreover, other researchers associate their paradigm definition with the way of seeing the others' point of view and accepting their perspectives on different issues to be open-minded to the world's beliefs (Creswell 2013). Consequently, Teddlie & Tashakkori (2010) argued that the study paradigm would give a new feature of accepting using different paradigms in the research field to match the researcher's interests, views, and nature of the context. Thus, the paradigm was discussed in some literature as:

*“the study in terms of differing paradigms, or worldviews that is, differences in the basic set of beliefs or assumptions that guide the way they approach their investigations.”*(Fraenkel & Wallen 2009 p.423).

The efforts of William James and others in (1842-1910) had initiated the pragmatic approach. Initially, the Greek literature owns the roots of the word (pragma) to describe the meaning of (action) and (practice). The English definition of the word 'pragmatic' was much related to the process of finding practical and possible solutions to any social study through human interaction (James 2000). Pragmatics focusses on the research problem and the research questions by placing them at the core of efforts to solve and judge human problems (Creswell 2003). For the same purpose, clarifying the study flow from the theoretical choice to the methodological dimension is an essential requirement to provide cohesiveness with a deeper understanding of the issue (Creswell 2010). The current research study investigated the nursing students' CT and MR and

investigated the students' abilities to practice decision-making skills ethically within the UAE multi-cultural context. The researcher found that the proposed pragmatic approach could be useful to investigate social judgmental phenomena with a better understanding of the other's feelings within the extensive worldviews (Creswell & Plano Clark 2011; Fraenkel & Wallen 2015).

A significant association has been highlighted between the pragmatist philosophy and mixed methods in many studies (Creswell 2013; Creswell & Plano Clark 2006; Creswell 2010; Fraenkel & Wallen 2015; James 2000; Teddlie & Tashakkori 2010). Creswell (2010) had listed the suitable fields for using mixed methodological approaches in their research studies and he included the nursing field specifically. He stated that:

*“Mixed methods study drawn from the fields of evaluation, nursing, public health, education policy, and research, and social and behavioral research”* (p.206).

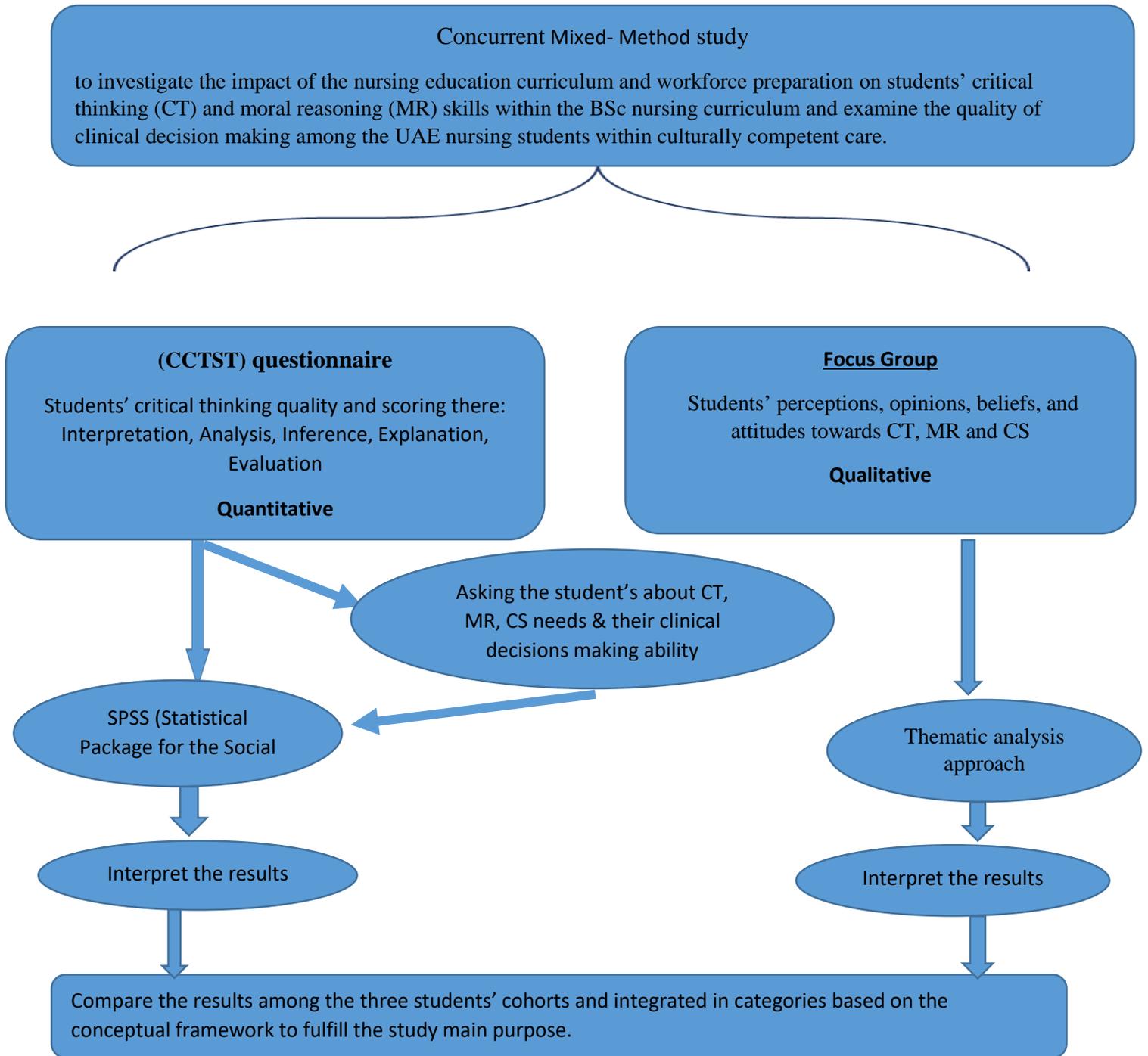
Following this stance, the mixed methodological approach has chosen as recommended by experts in the field for studying any worldviews, cultural or social phenomena that could be referred to the students' and teachers' social norms and values within the educational systems (Creswell 213; Fraenkel & Wallen 2015). Other researchers have stated the importance of the mixed approach. For instance, Teddlie and Tashakkori (2010) support the use of the mixed methodical approach as a starting point for any new study because of its simplicity and practical nature.

Using more than one method to study the same research phenomena to collect different data has been the preferred method of many researchers since the 1950s. As a result, researchers claimed that triangulation of the study could help in validating each finding and strengthen the weaknesses of the other in qualitative, quantitative as well as mixed methods (Campbell & Fiske 1959; Fraenkel & Wallen 2009). A mixed approach combining both qualitative and quantitative techniques is considered to be the research approach that can minimize the limitations of each one if it used alone. The mixed approach helps the researcher to interpret the results and decrease threats to the validity of the research. Fraenkel & Wallen (2009) stated that:

*“the researcher uses both quantitative and qualitative methods to study the same phenomenon to determine if the two converge upon a single understanding of the research problem being investigated. If they do not, then the researcher must investigate why the two methods provide different pictures” (p.561).*

In pragmatism, the researcher will utilize the ‘abductive’ reasoning process that moves freely backward and forward between an inductive and a deductive reasoning process to form hypotheses and explain observations and findings (Creswell 213; Fraenkel & Wallen 2015). Using different projects to answer the research questions through a multiphase mixed method approach can help the researcher in satisfying the study purpose (Creswell & Clark 2011). Researchers have claimed that mixed methodology has many strengths (Creswell & Clark, 2011). First, the flexibility in setting the study tools to answer the research questions. Next, giving the researcher the freedom in using the two methods that are sharing the same objectives separately in two different studies. Then, providing a clear framework to follow by other researchers at any time. According to Creswell and Clark (2011), the researcher could face many challenges and efforts in using multiphase mixed methodology research as; more time and resources, the ability in connecting the quantitative and the qualitative data individually and within each stage and publishing each phase’s results individually for clear feedback for the study. Finally, the researcher should justify the research’s main purpose through integrating and contrasting the two-phase findings.

The flow chart below presents the concurrent mixed-method study design.



**Figure 13** The concurrent mixed-method study design.

### 3.2 Methods

This study is a concurrent mixed study carried out based on the aims of the study seeking to investigate broad aspects. The researcher decided to conduct the two phases of this study concurrently, though within each phase the data was collected sequentially. However, multiphase design research can reflect different purposes according to Creswell and Clark (2011) such as large-scale program development and evaluation projects; multilevel statewide studies and single mixed-method studies that combine both concurrent and sequential phases. As presented in the first chapter, this study has utilized the CCTST quantitative method to answer the first research question while the quantitative method used the focus group interview to answer the second research question. The study's context was UAE nursing and healthcare sciences in governmental institutions that have grown rapidly over the 15 past years based on the community need. Many different universities have been recognized all over the UAE Emirates, either governmental or private, with great competition to attract the nursing students (Abu Hantash & Van Belkum 2016; Brownie et al. 2015; Wollin and Fairweather 2012). This study was specifically focused on studying the nursing program at governmental universities only. The researcher interested in researching health promotion in general and contextualizing the nursing curriculum around the UAE's cultural beliefs and values has directed this study. This research was undertaken at one of the nursing educational institutions in the UAE that has a pre-licensure on the Bachelor of Science Nursing (BSN) program. The college has four campuses in four different Emirates that teach nursing and other healthcare sciences. The college had the primary accreditation for the nursing program in UAE higher education when it was established in 2017.

However, this study was undertaken to address the following questions:

1. What impact does the nursing education curriculum have on three different nursing cohorts (undergraduate students, internship, and graduate) in terms of critical thinking, moral reasoning in the UAE?
2. What influence, if any, does the workplace preparation have on the three different nursing cohorts' practices concerning critical thinking, moral reasoning, and cultural sensitivity in the UAE?

Consequently, the following paragraphs are going to represent the context and site, population and sample, instruments, data analysis, ethical consideration, limitations, and finally the conclusion.

A summary table of the study concurrent mixed approach selected is represented in below table 2

Table 2: Summary table of the study methodology

Research questions	Approach	Instrument	Participants	Data Analysis
1. What impact does the nursing education curriculum have on three different nursing cohorts (undergraduate students, internship, and graduate) in terms of critical thinking and moral reasoning in the UAE?	Quantitative	Survey  California Critical Thinking Skills Test (CCTST) Insight Assessment website ( <a href="http://www.insightassessment.com">www.insightassessment.com</a> )	Quantitative sample:  (103) participants from three nursing student cohorts: -fourth year students -internship year seniors - Graduate students with one-year experience and more.	SPSS Descriptive and inferential stats
2. What influence, if any, does the workplace preparation have on the three different nursing cohorts' practices concerning critical thinking, moral reasoning, and cultural sensitivity in the UAE?	Qualitative	Focus group  (asked students about their perceptions, opinions, beliefs, and attitudes towards CT,MR and CS)	Quantitative sample:  15 students 5 students from each of the three nursing student cohorts: -fourth year students -internship year seniors - graduate students with one year experience and more	Thematic analysis approach

### 3.2.1 Site Selection

The study's context was UAE nursing and healthcare sciences in governmental institutions that have grown rapidly over the 15 past years based on the community need. Many different universities have been recognized all over the UAE Emirates, either governmental or private, with great competition to attract the nursing students (Abu Hantash & Van Belkum 2016; Brownie et al. 2015; Wollin and Fairweather 2012). This study was specifically focused on studying the nursing program at governmental universities only. This interest arose from being a nurse and a nurse educator with a broad range of experience and interests honed over a period of 24 years working in the GCC, 17 of which were spent in nursing education in the UAE with different posts and different settings. This has resulted in developing a deep understanding of the sector's growth and development. In addition, being a senior lecturer interested in researching health promotion in general and contextualizing the nursing curriculum around the UAE's cultural beliefs and values has directed this study.

This research was undertaken at one of the nursing educational institutions in the UAE that has a pre-licensure on the Bachelor of Science Nursing (BSN) program. The college has four campuses in four different Emirates that teach nursing and other healthcare sciences. The college had the primary accreditation for the nursing program in UAE higher education when it was established in 2017. It is approved by SEHA, and the MOH and fully approved by the UAE program's board of nursing the Emirati Nursing Association (ANA). The university was affiliated with other international universities in Australia such as Griffith and Monash to design and develop their nursing and healthcare curriculums. The college is accepting around 70 – 100 nursing students yearly across full-time and part-time programs. The nursing college runs its program over three semesters including a summer course. In the year 2018-2019 when this study researcher collected her data there were around 130 students enrolled in the nursing program at different levels on all campuses. This number expected to exceed 150 in 2019-2020 as per the number of students that were enrolled in the general requirement program (GRU) and (foundation year) who will be asked to choose their specialty at the beginning of the new academic year in September 2019.

### 3.2.2 Population, Sampling and Participants of the Study

Population of this study was a convenient sample of 103 nursing participants from three nursing cohorts' undergraduate students, internship, and graduate. Creswell (2014) claimed that a convenient sampling of the participants would provide an in-depth understanding of the center of the phenomena within a 'heterogeneous group' to afford the study with the maximum chances for comparable analysis and not to generalize the findings. The qualitative method used in choosing participants and sites is for the reason that they are 'information-rich' (Patton 1990; Creswell 2014; Fraenkel & Wallen 2012). The study intended to develop an in-depth exploration of the phenomenon in qualitative inquiry and selected the individuals and the site intentionally (Creswell 2012). Specifically, this study intended to select three nursing cohort, with 45 students in each cohort on average to acquire information about their CT, MR and CS at several sites as the college has 4 campuses in different Emirates for the quantitative approach. A combination of different student's levels - the fourth year students, the internship year seniors, and graduates with one year experience and more ( five students from each level for the focus group) who were thought to be of most help to the researcher to understand the CT phenomenon and develop a detailed understanding (Creswell 2014; Mahmoud & Mohamed 2017). Creswell (2012) has defined a population as "a group of individuals who have the same characteristic". While the sample is "a subgroup of the target population that the researcher plans to study for generalizing about the target population" (p.142). Many researchers supported the use of the qualitative research to accommodate the sensitivity of the cultural studies and the nature of the moral topics, listening to the participant's stories and emotions' to develop a clear understanding of the findings (Price 2011; Rushton, Kaszniak & Halifax 2013; Kaddoura 2017; Bindon 2017).

Power calculation needed in order to ascertain the number of participants in order deliver quantitative survey. The total size sample for each cohort is 45 participant as per the G.Power calculation below. For the three cohorts it will be  $(45 \times 3 = 135)$  participant).

t tests - Means: Difference between two dependent means (matched pairs)

Analysis: A priori: Compute required sample size

Input: Tail(s) = One

Effect size  $d_z = 0.5$

$\alpha$  err prob = 0.05

Power ( $1-\beta$  err prob) = 0.95

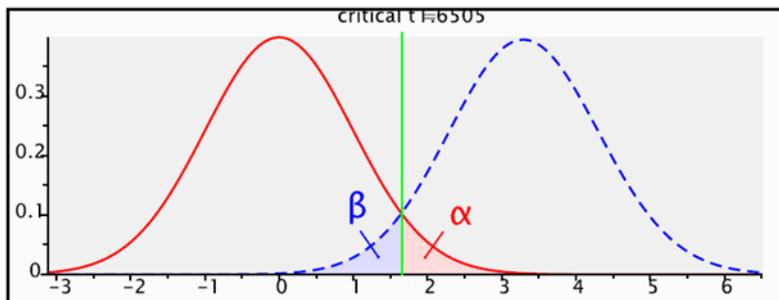
Output: Noncentrality parameter  $\delta = 3.3541020$

Critical t = 1.6802300

Df = 44

Total sample size = 45

Actual power = 0.9512400



The researcher sought to accommodate the focus group to collect the required data. She expected to hear many stories from the participating students as a result of a personal empathy with the Arabian female students. These students are used to talking and expressing their feelings and emotions during the college consultation and advising time on regular bases. This stems from the researcher's observation and experience in the nursing education field over a long period as a senior lecturer, clinical facilitator, program counselor and academic advisor in the college for the last 13 years. Creswell (2014) supports the focus on open-ended interviews of a group of people between four and six individuals. Also, claim that the focus group size should be within 10% of the targeted group to investigate any educational and social phenomena (Creswell 2014). Accordingly, the researcher selected 5 students from each cohort - the fourth year students, internship year seniors and graduates with one year experience or more at a time.

Convenient sampling is used to select representative participants for quantitative studies to be able to generalize the findings from these individuals to the whole population. High accessibility, availability, proximity to the researcher and achieving a representative sample are the best rationales for using convenient sampling (Creswell 2014). Quantitative research helps in testing and building theories that can be applied to a wider population provide useful information learn about the phenomena and an equal probability of being selected to represent the population (Creswell 2014; Fraenkel & Wallen 2012). Accordingly, quantitative methods were chosen to examine the influence of the curriculum preparations and clinical practice on the students' performance in critical thinking, moral reasoning and cultural sensitivity in the UAE.

The sample was from three nursing students' cohorts who enrolled in the nursing program at the college at the same time in 2019 including the postgraduates. The three nursing student cohorts are fourth year students who were in year three in 2018 and were still attending the college, mature and able to provide the study with constructive feedback about their preparation over the four years of the pure nursing curriculum and college teaching. Then, the internship year seniors who were in year four in 2018 and were under both supervisions, 'the hospital and the college', in their transition phase to be independent in their coming year. Finally, the post-graduate students with one year and more of experience in the hospital. They are totally separated from the college and they are totally under the hospital's supervision that could reflect on the workplace preparation of the nursing students CT, MR and CS specifically. Accordingly, the total number of the completely targeted population in 2019 will be 145 students as per the existing numbers of the students within the three cohorts based on the data that has been collected from the student services and admission department of the college in February 2018 at the four campuses. The quantitative study sample is 103 female nursing students and graduates and it is worth mentioning that the college is only enrolling female nursing students until the year of the study 2018. The researcher selected the samples, estimated the study's reasonable sample sizes for each approach, and interpreted the results for both for better generalization of the findings (Creswell 2012; Fraenkel & Wallen 2012). Exploring the experience of the participants with the phenomenon under study provided a deeper understanding of the participants' perspectives and cultural values in their institutional structure (Creswell 2014).

An e-mail was sent to participants who had volunteered to reconfirm their willingness to participate in the interview. Then, they were contacted by using the phone number that was provided to arrange the interview time, date and site. The researcher traveled between the four campuses (Abu Dhabi, Ajman, Al Gharbia and Al Ain) to meet the participants at their university site for forty-five minutes approximately for each group. The environment of the four interview settings is important to support the critical thinking questionnaire and open the discussion for the focus group interviews in a relaxing, productive and quiet location, confidentially in a meeting room or an office space.

### **3.3 Instrumentation**

Instrumentation and data collection tool have been concurrently collected for both types of data during the same stage. It was believed that the combination of qualitative and quantitative research ‘mixed design’ at the same time will support the aim of the study and help in investigating the CT of the students, MR and cultural sensitivity (Creswell 2014; Atchison 2016). The qualitative method was conducted through the focus group interview as the open-ended questions allowed the nursing students to elaborate more, which matched the student’s nature within the UAE context. Moreover, to support the researcher’s interest some questions were added purposefully with a high understanding of the importance of piloting the used tool to assure the study themes’ clarity before its actual use (Creswell 2014; Fraenkel & Wallen 2012). Furthermore, the cultural sensitivity was expected to be elaborated more using this tool with a deeper understanding of the student’s clinical judgment abilities during the students’ group and individual elaboration (Fraenkel & Wallen 2012). The research instruments should be planned before data collection by the researcher. The measuring tools of this study were used in assessing the individuals’ abilities or achievements through the individuals’ behaviors to develop answers for the research questions (Creswell 2014). To explore the CT, MR, and cultural sensitivity within the UAE nursing curriculum and investigate the students’ academic preparations to practice clinical judgments in the clinical settings, this study utilized the CCTST questionnaire besides the focus group interview for the workplace preparation as explained in the below paragraphs.

This study was specifically focused on studying the nursing program at governmental universities only. The researcher interested in researching contextualizing the nursing curriculum around the UAE's cultural beliefs and values has directed this study. The researcher found that the CCTST is a relevant tool to be used in this study for many reasons as it has high validity and reliability and the CCTST was utilized by other researchers in testing the nurse's critical thinking in the UAE nursing educational institutions in many previous studies in the literature (Kaddoura 2011). This research was undertaken at one of the nursing educational institutions in the UAE that has a pre-licensure on the Bachelor of Science Nursing (BSN) program. In addition, the researcher was planning to guarantee the ethical approvals from the college and the healthcare authorities through using a trustable tool. The collage has four campuses in four different Emirates that teach nursing and other healthcare sciences. The college had the primary accreditation for the nursing program in UAE higher education when it was established in 2017 and the researcher needs to convince the college leaders to facilitate the conduction of the research and help in obtaining the ethical approvals.

### **3.3.1 The California Critical Thinking Skills Test (CCTST) questionnaire.**

Concurrently, the first instrument is a quantitative research approach; this method allows validation (Creswell 2012) of that students' critical thinking and moral reasoning skills. The representative sample of students was from different cohorts (undergraduate students, internship, and graduate) of the same educational system. The researcher chose to use the California Critical Thinking Skills Test (CCTST) (form B) questionnaire. The (CCTST) questionnaire is an instrument that was completed online through the Insight Assessment website ([www.insightassessment.com](http://www.insightassessment.com)) which has been contacted to approve and open access to the participants to access the test as per their protocol after completing the whole payment. The CCTST contains 34 multiple-choice questions related to broad scenarios and different situations. The (CCTST) questionnaire is expected to take 45 minutes to complete (Kaya, Şenyuva & Bodur 2017).

Facione (1990) developed the CCTST questionnaire that can study and inspect the students analyzing and evaluating their critical thinking abilities based on a set of data and situations and generalize the student's abilities in making proper and safe decisions and draw conclusions. The test has other subsections that measure the students (open-mindedness, truth-seeking, systematic analysis, self-confidence, inquisitiveness, and maturity) and is widely cited (Wagensteen, Johansson, Bjorkstrom, & Nordstrom, 2010; Kaddoura 2011; Kaddoura 2017). More than 58 healthcare research studies utilized the CCTST with strong recommendations to keep on using it in testing the students' critical thinking, and moral reasoning skills in any culture. In addition, the CCTST was highly reliable through the meta-analysis to health care trainee success (Butin 2015; Escolar & Chua 2016; Hansen 2013; Facione, Facione, & Sanchez 1994; Kaddoura 2011; Mahmoud & Mohamed 2017; Zoboli & Schweitzer 2013; Ross et al. 2013; Jennifer 2017). Specifically, many nursing researchers have recommended the use of the CCTST tool to determine their analytical power (Giddens & Gloeckner, 2005; Hicks 2003; Mahmoud 2012; Stewart & Dempsey 2005). Others have another specific tool for nursing education only to achieve additional expressive results (Facione & Facione 2014; Landivar 2013; Mahmoud & Mohamed 2017). The CCTST test proved to have high-reliability scales to measure the nursing students' CT abilities and their preparation within the clinical settings (Kaya, Şenyuva & Bodur 2017; Kaddoura 2011).

Analysis of variance (ANOVA) is a statistical technique that is used to check if the means of two or more groups are significantly different from each other. Over the years, educational and psychological researchers relied on the prevalence of variance (ANOVA) as a foundation of most of the curricula in research methods, which can track the social and behavioral skills, between-group variance and within-group variance (Analysis of variance, 2020). For that, this study explored the nursing education curriculum, which made the ANOVA a suitable research method to examine the impact of the preparation on the three different nursing cohorts. Historically, ANOVA reporting practices, including p-values and the effect sizes, have been widely published in many scientific journals (Zhou and Skidmore, 2017). ANOVA is a statistical method of testing used for developing an explanation for the statistically significant observed data and confirming the findings (Analysis of variance 2020). Correlation is a bivariate analysis that measures the strength of association between two variables and the direction of the relationship. This study

utilized the Pearson correlation coefficient (Pearson R test), in which Insignificant  $>0.05$ , Significant  $0.01 - 0.05$ , and highly significant  $<0.01$ .

Factor analysis is utilized to minimize and decrease the correlated variables observed with large quantities into smaller numbers (factors) of unobserved variables in a statistical method (Dowd et al. 2018). Niranjana (2004) listed the main four steps for factor analysis as follows: Data collection and generation of the correlation that is used as an input for factor analysis, extraction of initial factor solution, rotation and interpretation points to one output, and construction of scales or factor scores to use in making a decision. Accordingly, in this study factor analysis was conducted based on the specified CCTST six domains (factors), namely: Overall, Analysis, Evaluation, Inference, Inductive and Deductive Reasoning (Insight Assessment 2019; Insight Assessment 2020). The CCTST identified the factors or variables that were coded into three digits and more from the test-takers' information and subgroups as per the participants' cohort educational level, age, and the individual test domains scale scores. This study adopted CCTST, a highly reliable benchmark test, which based on the APA Delphi consensus conceptualization of critical thinking in 1989/90. For assessing reliability, the construct validity was determined through factor analysis, internal consistency, and group differences within the test. The CCTST over 20 years of research developed a validated and reliable test with a theoretical foundation of 34 items designated for the inclusion of the five CT cognitive skills interpretation, analysis, evaluation, explanation, and inference, created from a pool of 200 questions. The CCTST items designed in a multiple-choice style with 3-4 distractors to be scored dichotomously with one correct answer. The factor components used in factor analysis of the test were the results indicate the CCTST includes five domains in five fields of cognitive skills of critical thinking (analysis, evaluation, inference, inductive and deductive reasoning). As a result, the specific skill scores reported have internal consistency, test-retest reliability, and strong value as indicators of particular strengths and weaknesses (Insight Assessment 2019; Insight Assessment 2020 p. 70) for further details (See Appendix A). Factor Analysis has two main types, principal component analysis and common factor analysis (Niranjana, 2004). Principal component analysis is a rebuild of the results of the original data from the total variance between the variables, and the average of several factors, as there are variables, is the solution. Meanwhile, common factor analysis aids in

grouping the variables under one or many factors, and identifying the number of variables that are correlated (Niranjan, 2004).

In addition, the study followed a piloting test on a small scale to test the tool suitability and validity (Creswell 2014; Teddlie & Tashakkori 2009) to identify any issue that may affect the main study purpose of testing CT and MR among the nursing students in UAE's culturally sensitive context.

### **3.3.2 Focus Group Discussion**

Exploring the core of any social phenomena through qualitative research has been supported by Creswell (2013) within complex clinical contexts to understand the peoples' responses and nature (Price 2011) as well as the complexity of the teaching-learning process (Medina 2012; Perez 2012; Medina 2014). Moreover, qualitative studies must be explored deeply to explain the nursing and healthcare professional practices (Muir 2010). To report any variances in quantitative findings, researchers have used focus group interviews to clarify the issues raised from the reported comments through following a protocol that develops better analysis of the data (Fraenkel, Wallen & Hyun 2014). Triangulation to interviews assisted in building coherent and justifiable themes (Creswell 2014), Participants' checking as the transcription and the themes were given to the participants to determine whether they think they were accurate or not and asked to add their comments (Creswell 2014). Then, rich and elaborate description of the findings: as a clear description was given to provide details of different themes, which made the results richer and more realistic (Creswell 2014). In addition, the researcher's bias and role was assured, as the researcher justified her roles and responsibilities as a researcher and as an educator for all the participants. My long experience in the field of education over 18 years in the UAE and another 8 years in the clinical fields with a total of 26 year in the GCC. This long experience in the country and the good understanding of the participant's culture and experienced the UAE culture effect in supporting the nurses working in the UAE and dealing with nurses from different nationalities, Western, Arabs and locals. I deliberated myself as an insider and outsider at the same time. Insider, because of my long experience as an nursing educator in the UAE and my knowledge of the GCC

hospitals , and an outsider because I am not Emirati and I haven't lived their experience. I come from a different culture and I am fully aware of how my background can play a role in shaping the data collection and findings. The bias could have prejudiced the data collection stage as the researcher's bias might lead to misinterpretation of the participants' opinions (Krueger & Casey 2000). To evade this, I tried to control the subjectivity and always required the participants to provide more clarifications to their opinions. Bias might extend to data analysis where subjectivity might restrict in the analysis of the interview results (Kvale & Brinkman 2009). To avoid that, I asked another qualitative researcher from my colleagues who had long experience in the college who understand the UAE culture and clinical and expert researcher to review the qualitative questions and findings, in addition to triangulation and participants' checking.

Thus, the researcher needs to use a recorder to transcribe the data and interviewees had the right not to record the interviews, the interviewees were provided by the information sheet about the study to sign a consent before starting. The focus group's discussion audiotaped the transcriptionist after recognizing their voices to collect shared understanding as well as to get views from each specific cohort after gaining their permission. To limit the influence of the researcher professional experience and her expectations on the participant's responses a concentrated effort to remain objective while conducting all interviews and interpreting data is intended to collect the needed data as expecting to hear many perspectives from the participants. The environment of the 4 interview settings and the big meeting room for all the groups discussion at the end was important to support the critical thinking open discussion in a relaxing, productive and quiet location confidential in a meeting room or in an office space. The qualitative data were collected from the focus group using open- ended questions to allow the participants to elaborate more on their experiences with regard cultural sensitivity and ethical dilemmas they faced in their clinical workplace.

After gaining the study proposal approval from the British University in Dubai. The researcher gained the Institutional Review Board (IRB) at the selected nursing college, then initial clinical setting SEHA permission processes and the permission of the senior nursing management at the selected hospitals with the collaboration of the in-service education nursing staff who are following up the nursing students at their hospital. A written approval consent to the participants describing the study purpose of the focus group included the date and location of data collection. The ethical

approval outlined the participants' rights with their right to quit at any time, their voluntary participation, and their right to know the purpose of the study with no risk or harm on them. Pilot test with undergraduate and postgraduate nursing students needs was acknowledged. Piloting the used tool to assure the study themes clarity before its actual use. The cultural sensitivity is expected to be elaborated more using this tool and deeper understanding to the student's clinical judgments abilities as per the students group and individual elaboration. The researcher intended to accommodate the focus group to collect the qualitative data from the participants, from each cohort the fourth year students, internship year seniors and novice with one-year experience and more at the same time 15 in total.

The rationale behind the focus group was to gain a good interaction, cooperation and confidence among the participants that may lead the students to gain good self- confidence and provide their best information (Butin 2015; Escolar-Chua 2016). An e-mail was sent to each participant who had volunteered to reconfirm their willingness to participate in the interview then contacting them using the phone number they provided to arrange the interview time and site. It is worth mentioning that all participants from the three cohorts took the "NRS3301 Cultural in Nursing and Health in the UAE" course where they learned and trained on how to assess the patient's cultural needs and provide good cultural competent care accordingly. The course explored concepts focusing on cultural safety and competence while fostering understanding of the UAE people's culture, health traditions and determinants of health. Finally, the researcher kicked off the discussion by asking them an open-ended question about their experiences with their patients then let them elaborate on their real experiences among themselves. The researcher observed from a distance and recorded their responses without direct interference.

Ritche and Lewis (2003) stated that the group context of focus groups generates a process that is in some significant respects distinct from an in-depth interview. The interaction between group participants in which they present their own perceptions and experiences in excess with listening and reflecting on what is said to consider their own viewpoints further, triggers the data. Therefore, and in response to what participants hear, they ask questions, seek clarification, make comments and prompt others to expose more. As the discussion progresses, each participant's standpoint becomes sharpened, refined and developed into a more well-thought out level.

Walliman (2015, p.15) opined that the strong social context that focus groups produce reflects the “social constructions-normative influences, collective shared meanings” of how people perceive, experience and understand a phenomenon. It is worth noting that some researchers believed that how students perceive learning something affects how they usually perform in it (Ajzen, Czasch & Flood 2009). During the focus groups, the researcher moderated the discussion to encourage the participants to present their own views by means of active listening and observation; the researcher kept a mental note of the discussion and captured any non-verbal data. The researcher probed the entire group and individual participants equally using open questions expressed in simple language. In the current study, four focus groups were conducted to have better insight into the students’ opinions and experiences about their critical thinking, moral reasoning, and cultural sensitivity skills and preparation. The participants were selected randomly from each of the three cohorts of 15 students per group in total. For instance, five from the fourth-year, five from the internship year (seniors) and five graduates with one-year experience and/or more. First of all, the students received an invitation email from the researcher who had mentioned the project's aim, objectives, time and venue attached with the information sheet and a consent form. Then, the participants were invited to their college campus at one of the pre-prepared and booked meeting rooms to conduct the interviews. A coffee break was provided to introduce the participants to each other before starting the interview sessions. The group leader who was nominated because of good communication skills and active personality was asked to talk on behalf of the group. Then, every group leader started to present the experiences of each cohort in front of all, and the researcher opened the door for further discussions and comments. The analyses of the verbal and nonverbal keywords, concerns and interests enriched and enclosed the analysis of the findings (Fraenkel, Wallen & Hyun 2014).

The researcher’s understanding of the complexity of both the UAE clinical and educational institutions is based on being a part of this community for the last 15 years, as a senior lecturer at the college and clinical instructor at the hospital who can approach the students to express their feelings and impressions freely during the focus group interviews. The interviewer had asked some questions about the students’ preparation of CT, MR, and CS at their college and provoked the answers from all five of the students in each group. The rationale behind the focus group is that it is less time consuming, can gain deep meanings, a good standard of interaction, cooperation and

confidence among the participants that may lead the students to gain good self- confidence and provide their best information (Butin 2015; Escolar-Chua 2016). Science the research interviews were a new experience at their college based on the limited research environment around these students, with minimum exposure to the same experience. Also, being a lecturer for the students previously who taught in the classroom, laboratory, and clinical settings with each cohort encouraged them to talk and control the discussion (Creswell 2012) and to facilitate their group discussion spontaneously. The focus group's discussion was audiotaped, and a transcriptionist recognizing their voices to collect shared understanding as well as to get views from each specific cohort at their convenient time. To limit the influence of the researcher's professional experience and her expectations of the participant's responses, a concentrated effort was made to remain objective while conducting all interviews and interpreting data.

The researcher played the role of a moderator during the face-to-face focus group interviews for almost two hours as the students enjoyed the discussion and provided valuable responses. Group discussion was a novel experience for the students at the nursing college as they did not go through this experience before and the college has very limited research events. The moderator started the interview with introductory questions to explain the study's purpose, aim, procedure and ethical considerations. Then, the planned 12 transitional and key questions followed as;

1. What is your general impression about the students' preparation of CT, MR, and CS at the college?
2. How familiar are you with understanding the complexity of both the UAE clinical settings and nursing educational institutions after being a part of this community?
3. How were you first introduced to critical thinking, cultural sensitivity and moral reasoning in nursing?
4. What do you already know about critical thinking, cultural sensitivity and moral reasoning in nursing? What would you like to learn more about each one?
5. What words and expressions come to your mind when you think of nursing clinical moral and ethical decision making? Can you elaborate?
6. When, how, and where do you use critical thinking, cultural sensitivity and moral reasoning in nursing?
7. What do you like best about cultural sensitivity?

8. What are your problems or concerns when using moral reasoning in nursing?
9. What trends do you see happening in our nursing field about critical decision-making?
10. What features of nursing have disappointed you?
11. To what extent, do you think, does the college nursing curriculum influence the preparation of nursing students to utilize critical thinking, moral reasoning, and cultural sensitivity skills in clinical settings in the UAE?
12. What curriculum changes would you recommend making to become a distinguished leading nursing institution in the region?

Interviews using open-ended questions could help the researcher produce a clear picture of the information that he is looking for such as views and opinions of the participants (Creswell 2014). A qualitative design is believed to be a suitable method to fulfill the research aims and a capable way of producing the 'in-depth' and rich the data required to answer research questions. Many researchers used thematic analysis and applied Moustaka's (1994) method, Creswell (2012) as well as Braun and Clarke's (2006) six steps to interpret the qualitative data. Burns and Grove (2014) supported the idea of using the qualitative research style to explore the individual's life experiences, which is appropriate to this study. Semi-structured interviews have been used to determine many nursing practices, concerns and inquiries in education within a qualitative framework to generate validations for the manifestation of these experiences (Thorne, Kirkham & O'Flynn-Magee, 2004). A focus group interview methodology was conducted with 15 participants from the nursing students in Abu Dhabi colleges and working graduates at Abu Dhabi hospitals for purposes, using open-ended questions to gain a deep understanding of the study objectives. The participants from the three nursing cohorts were five fourth-year students, five internship year seniors, and five graduate students with one-year experience and more. The researcher met each group from the same cohort and interviewed them separately. Then, the 15 participants joined another mixed meeting in one time together in the same date and the researcher interviewed all of them. The researched aimed to have more elaboration and deep discussion as they all had the same curriculum and clinical preparation.

Creswell (2012) discussed the importance of using group interviews as a satisfactory method to test people's attitudes, study their opinions about the learning styles, and explore their effect on

education and learning in general. Open-ended questionnaires were considered a good approach to use for this study specifically because they provide a free, open, supportive and motivating atmosphere to collect the participants' answers clearly with unlimited data (Diefenbeck, Michalec and Alexander 2016). Then, 'multistep coding processes' were used to analyze the collected data and produce a good understanding of the findings (Miles, Huberman and Saldaña 2014). To originate themes from the obtained, data the researcher followed these steps: familiarization, coding, theme development, charting, mapping and interpretation. The themes incorporated all discussion concerns that took place during the interviews. Four themes were emerged from all combined interview analyses and are discussed in the following section. The quotes presented are representative samples from interview groups.

Thematic analysis in qualitative data helps to provide an in-depth understanding of the collected data through the phenomenological research design. The researcher focuses on commonality and gives the events and the situations a universal meaning within a particular group (Braun & Clarke 2006; Creswell 2012). To interpret and analyze qualitative data, this study utilized Moustakas (1994) method of phenomenological analysis, Creswell (2012) and Braun & Clarke's 2006 six-step process. Accordingly, the researcher familiarized herself with the collected data. Then, to dig deeper into the meanings of the data, she followed the six steps little by little to; develop the themes, find the connections, define each theme, finish the work and produce the report (Creswell 2012; Moustakas 1994).

The six steps were:

1. Horizontalization; a reduction process of the collected data made to treat all details and statements with equal value. The researcher removed all repetitive and not related statements to the research questions from the 15 nursing participants' discussion (Creswell 2012).
2. Clusters of meanings; the researcher applied a deep and reading through the collected statements. Then, she grouped units of meaning together through going back to the nurses' recorded interviews to derive clusters of appropriate meaning from forming themes (Creswell 2012; Moustakas 1994).

3. Textural description; the researcher employed the collected themes, statements that were applied to aid in describing the participants' perspectives to write a description of the participants' experience and opinions (Creswell 2012) related to the CT, MR, and CS. The researcher got as close to her participants as possible as she taught most of them to construct the meaning of the discussed situations.
4. Structural description: Additional use of themes and statements was developed by the researcher to write a description of the context that affected how the participants experienced the phenomenon (Creswell 2012).
5. Bracketing: in general, bracketing is all about being unbiased. The researcher has to set aside his/her own and personal experience to ensure a credible and accurate outcome in a process. It also includes setting aside the knowledge of the previous research findings and theories about the research topic.. Simply put, it sets aside one's own understanding of the sensation and looks at how other people experience it. Based on that, although the researcher is not from the same culture as the participants, she stated her own experiences. However, owing to the researcher's earlier understanding and knowledge of the participants' world, it assisted her in the interpretation. Therefore, by detailing the researcher's experiences, this highlights her frankness (Tuohy et al. 2013).
6. Essence: the researcher wrote about the common experiences of the participants from the textural and structural descriptions. By that, it is meant that she used those participating in the study, who have had a similar experience, and are therefore analysed as a unique expression, and then compared to identify the essence (Marshall & Rossman 2011, p.20). By comparing them to existing literature and suggesting limitations or future research, the researcher could interpret the findings (Creswell 2012).

The researcher started with data collection from the participants, and then transcribed the collected data. After that, intensive reading was applied to generate meaning from the compiled statements. Next, based on unique patterns, the researcher established the codes to organize the collected data. The third stage was applied according to Creswell (2012). The information was reduced to a small number of themes or descriptive themes, or, as explained by Moustakas (1994), clusters of meaning. Later, the study themes were named and used to write a detailed description

of the participants' actual perception, actions, and words. A detailed discussion of the data was required to provide the readers with a clear understanding of the main study themes. This thematic analysis process with the continuous reflection aimed to answer this study's research questions. Similarly, Braun and Clarke's (2006) found the phases of analysis to the collected data through the inductive approach then implemented the steps of the analysis.

The thematic analysis phases, along with the procedure followed, are summarized in table 4.11 below.

	Phase	Description of the process	Procedures
1.	Familiarizing self with the collected data	Recording the data, reading and repeat reading, recording main ideas	The researcher spent a long time reading the transcripts of her participants and reread them more than three times to categorize meaning and patterns to the data
2.	Generating primary codes	Collating data that are appropriate to each code is the most exciting feature of the data within the completely systematic approach.	Although this phase was a challenging phase for the researcher, it was beneficial for her to produce initial codes from the collected data. Meaningful transcripts as passages, quotations, and single words were coded from the data.
3.	Inquiring for themes	Organizing the initial codes into possible themes, gathering all the applicable data to each probable theme.	The researcher worked on analyzing and arranging the codes to identify the theme
4.	Reviewing themes	Ensuring the relation between the themes and the extracted codes level 1, and the whole data set to level 2. Then, a thematic map of the analyses was produced.	The researcher confirmed the themes in relation to the collected data by reviewing and reading the whole set of data.
5.	Defining and naming themes	Improving the details of every single and overall theme was performed through contentious analysis to produce perfect definitions and names for each theme.	The researcher concentrated on determining the features of the data and research questions to the theme that fit by defining each theme and detecting the core of the theme.
6.	Producing the report	Creating a scholarly report of the analysis is the last chance for review. In order to produce the report, the researcher selected vibrant and compelling quotation examples, the final analysis of selected quotations, and linked back the analysis to the research questions and literature.	The researcher followed the mentioned steps to analyze the data and created a narrative about the data.

Table (4.11): Thematic Analysis Phases Adapted from Braun and Clarke (2006).

The participants' general opinion about critical thinking, moral reasoning and cultural sensitivity (online questions). The researcher requested the Insight Assessment team to add three online background statements to respond to before the participants started the CCTST questionnaire. Those statements were ice breaking and warm-up to encourage the participants to talk and elaborate more during the interview based on the interview protocol. The participants had clear instructions to start answering these statements before they began their actual CCTST (34) multiple-choice questions by replying, "Agree or disagree", and the participants' responses were used in the qualitative discussion and results only. The three online questions concerned the participants' general opinion about nurses' critical thinking and moral reasoning skills preparation to overcome the cultural differences within the UAE context within the educational and clinical settings. The three background online statements were:

1. Patients' opinion towards their nurse's daily clinical decisions is essential within the UAE hospitals.
2. The nurses' role is vital in handling the patients' everyday cultural and moral dilemmas.
3. The current nursing education curriculum needs to be reformed to effectively teach moral and cultural clinical decisions to overcome the cultural differences within the UAE.

Finally, the moderator simplified and summarized the students' answers, responses and suggestions through the concluding questions. The researcher came up with clear themes and conclusions after transcribing and analyzing the focus group records word by word.

### **3.4 Data Analysis**

Data analysis for the qualitative findings has been analyzed through the thematic analysis approach that is considered appropriate for qualitative studies and can examine the collected interview data and capture the response patterns to answer the research questions (Creswell 2014; Vaismoradi, Turunen & Bondas 2013). The researcher followed the recommended six steps for creating the findings' themes from the obtained data to support the research interest and answer

the research question. The recommended six steps were as follows: ‘familiarization with the collected data, coding, finding themes, reviewing themes, naming themes and reporting’ (Boyatzis, 2009; Creswell 2013). The responses to the open-ended questions from the 15 students according to their characteristics and knowledge were gathered and analyzed. The participants were five students from each of the three nursing student cohorts as (fourth-year students, internship year seniors and graduated students with one year/ or more experience). The data analyses of all the interviews helped the researcher to develop the common themes that addressed the extent to which the nursing workplace impacts the students’ preparation for critical thinking, moral reasoning and cultural sensitivity in the UAE. The researcher discussed the collected themes from the nursing students individually in chapter four using the actual responses with their specific details of the participants’ quotes.

This strategy was followed to confirm and provide insight into the students’ preparation in CT, MR and the cultural sensitivity of the UAE colleges and add new knowledge about UAE nursing students. Meanwhile the students’ CCTST scores were collected from the Insight Assessment in an Excel sheet separately. After that, modifications were applied to accommodate moral reasoning and cultural sensitivity in the UAE through the Insight Assessment approvals and protocols. Then, every individual participant’s scores were entered into the SPSS (Statistical Package for the Social Scientists) tool for analyzing the data of the study.

### **3.5 Pilot Study**

Piloting the study is considered one of the most important principles for any research to find out whether the aims were appropriate and covered (Creswell 2014). Besides, it is helpful to know if the questionnaire works accurately before using it in the research study (Johnson & Christensen 2012). Fraenkel, Wallen and Hyun (2014) for validity and reliability purposes recommended conducting a pilot study of the questionnaires to assure the validity of the used questionnaire. A pilot study took place at the college computer lab after providing a minor group consisting of three nursing students with their CCTST account. A purposive sample that can be logically assumed representative as judgmental selected based on characteristics of a population and the purpose of the study. The population of the three cohorts (one from each cohort) was asked to answer the

questionnaire using the provided experimental account number and passwords in a trial meeting with the help of the college IT department. After that, the three selected students from the pilot study were excluded from the actual study sample that was made of 103 students at the same levels in the nursing program. Applying the piloting process through the selected participants' sample is recommended to facilitate the implementation of the used tool after evaluating their feedback (Stringer 2007 & Creswell 2012).

The researcher decided to pilot the CCTST questionnaire to help improve any deficiencies before its actual use by the participants. The researcher selected the convenient sample of three students, one from the fourth-year students, internship year seniors and one graduate student with one-year experience and not included in the assigned sample.

Conducting the initial assessment of the questions generated important feedback used to make the following adjustments;

1. Asking the students to download the CCTST application at their devices before conducting the test.
2. Informing the students about the actual test time to be prepared and try to be free for 45 minutes on that day.
3. Advising the students to focus during the test and avoid any distractions to use the time efficiently to answer the questions.
4. Giving the students the option to use their own devices if they are not willing to use the computer labs.
5. Informing the students that they have the right to use their preferred language to answer the test and notifying them that it would not affect their final test mark though it would have great significance to enhance participants' understanding of the questions.
6. Informing the students that some questions seemed difficult for participants to understand. Thus, pictures and graphic organizers were displayed with a very brief explanation of these strategies.
7. Informing the students that each participant would have a very different version of questions before they started and that the test contained 34 multiple-choice questions.

The CCTST has demonstrated that the developed questions that were included within the questionnaire were appropriate for testing the students' critical thinking in many studies (Gholami et al. 2016; Kaya, Şenyuva & Bodur 2017; Kaddoura 2011; Kaddoura 2017). The researcher found that one weakness was the fact that most students were confused and not that familiar with the online or digital tests, so a small introductory paragraph was added at the information sheet to explain the questionnaire technique before they started the test.

Rattray and Jones (2007) illustrated that extensive pilot work in research is required to refine wording and modify content. The researcher should work on refining and improving the content of the focus group questions through a pilot focus group interview trial session (Rattray & Jones 2007; Williams, et al., 2015). In the current study, the researcher planned a day for piloting the interview questions using a homogeneous convenience sampling. For instance, piloting this study sample included students from the three cohorts; the fourth-year students, internship year seniors and graduate students with one-year experience. The results of the trial focus group interview were excluded from the actual sample results. A pilot study is measured as one of the most vital and essential tools that can guarantee a valuable insight of the used methods and tools in a mini version of a full-scale study within a similar context (Glesne 2011). Piloting the research questions, instruments, context, and the targeted population should assure the appropriateness, clarity, validity, and reliability of the study findings and was able to collect the necessary information to meet the objective of the study (Williams, et al., 2015).

### **3.6 Validity and Trustworthiness**

The trustworthiness of any applied research assessment tools should be measured through multiple tests to guarantee their safety and measure the trust that can be placed in their results (Williams, et al., 2015). Validity and reliability are the two measures for any questionnaire. Besides, researchers have explained that if the research tool used is considered reliable for use that could guarantee its validity. The reliability of the assessment tool is the ability of the tool be constant when it is used for the same measurements and under the same conditions (Creswell 2013; Tavakol & Dennick 2011). Many previous studies had the same interest in studying the students' critical thinking skills in different contexts (Kaya, Şenyuva & Bodur 2017). Accordingly, that

helped this study researcher to gain reliable information and practical questions concerning reliability and validity. The researcher found many previous studies utilized the CCTST as a measuring instrument for evaluating undergraduate students' critical thinking and moral judgment skills (Gholami et al. 2016). This study was further supported by a pool of literature that discussed the critical thinking skills among the nursing students in particular (Kaya, Şenyuva & Bodur 2017). However, all of these elements facilitated the current study by providing a benchmark for measures in the quantitative part of the study; but still, it was a new tool for both the students and the institution to comprehend. This is worth mentioning that the CCTST assessment developers had previous experience with previous studies within a very similar context to the current study with a mixture of spoken languages from multicultural persons (Insight Assessment 2020). That positive experience supported the students to choose their preferred language before starting the test, either English or Arabic, or any other language based on the researcher's desire to avoid any unexplained variations in the results.

Johnson and Christensen (2014) explained that the consistency and stability of the assessment tool reflects its reliability and could encourage the participants to answer the used questionnaire with truthful responses. The assessment tool's capability to satisfy the study objectives could be measured through the validity (Tavakol & Dennick 2011). Tavakol and Dennick (2011) claimed that Cronbach's alpha coefficients test is considered as the most common reliability test to calculate the research's reliability. Accordingly, researchers designated special values to measure the reliability of the alpha coefficient as follows (very highly reliable > 0.9, highly reliable 0.80-0.90, reliable 0.70-0.79, marginally reliable 0.60-0.69, and unacceptable <0.60) (Cohen, Manion & Morrison 2007).

The Insight Assessment's researchers in the 1970s directed the instrument development program. They claimed that:

*“Testing instruments sold by Insight Assessment have demonstrated the strongest evidence for validity (predictive/criterion validity), and have met the threshold for strong internal consistency reliability. (a minimum Alpha of 0.80 for attribute measures and a minimum KR-20 of .72 for skills measures) for their OVERALL Scores and are observed to maintain*

*this performance in all samples of adequate variance”* (Insight Assessment manual 2020, P. 45).

However, Cohen, Manion and Morrison (2007) claimed that the correlation coefficient should be 0.05 or higher to guarantee the reliability of any study. Gholami and colleagues (2016, P.17) claimed that test-retest reliability for all Insight Assessment instruments exceeds (0.80) in samples with adequate variance and retested at two weeks post pretest. Their study “showed a correlation coefficient of (0.9). The internal consistency coefficient using Cronbach's alpha was calculated as (0.7 to 0.77) for the sub-scales and as (0.79) for the total scale”.

In this study, the researcher used the California Critical Thinking Skills Test form-B (CCTST-B) questionnaire that calculated the reliability using the “Internal Consistency Reliability” (KR-20, Cronbach’s Alpha) for all the used measures of critical thinking skills as it was designated at the CCTST user manual and resource guide (Insight Assessment 2020, P46). The Cronbach’s alpha coefficients test was recommended in 1988 by the developers of the CCTST questionnaire and is grounded in the APA Delphi definition of critical thinking. The scoring for these instruments is in a Likert Format with a minimum (Alpha of 0.80). The overall measure of critical thinking mindset value exceeds (0.91) in many language translations. Likewise, Kaya, Şenyuva and Bodur (2017) conducted a longitudinal design study that aimed to “determine nursing students' critical thinking disposition and emotional intelligence in an academic year in Turkey. Their focus population consists of 197 nursing students during their first year. The study found that the total Cronbach Alpha coefficient was found to be 0.84. This is considered a very strong value that has been detected in independent samples collected over the past 25 years consistently (Gholami et al. 2016; Insight Assessment 2016; Vaghar Seyyedini et al., 2009).

As this research is of paramount importance to me, I have taken into consideration all little details that might affect the survey in any possible way. Accordingly, I have personally funded the whole payment from my personal earnings to cover the CCTST expenses, as I understand its high validity and importance to the study. I took full responsibility for calling each student individually

and made sure that she understood the research's main aims and objectives. The research environment is a very new experience for the students at the college. It took me more than 5 months to contact 214 students to request their participation in the study after sending them an introductory email in advance. Approaching the postgraduate students was an issue; it was very hard to find them free as they are working in different shifts day and night. For instance, it took me two months to follow up with three students to answer the questionnaire in different stages after they had received the usernames and passwords. Others used their username and password but they withdrew the test, which forced me to buy new once. Sometimes it was essential to call them many times before the test and during the test day to solve some technical issues in their personal devices and call the USA then call them back for the new password after they received the study invitation email. All of that was acceptable to give credibility to my research and all for future improvements in the domain. In addition, I took full responsibility for all of the technical and detailed steps to ensure complete reliability, trustworthiness and accurate results.

The current study applied the CCTST questionnaire that has been created developed and refined by the Insight Assessment. After extensive reading of the literature, I decided to apply the CCTST questionnaire as it is tailored to be suitable to assess the individuals' critical thinking at different levels; undergraduate, graduate and postgraduate (Kaya, Şenyuva and Bodur 2017). The Insight Assessment team assures the reliability and the validity of its test through contentious updating series to guarantee the users with the test findings technically, culturally and purposely (Gholami et al. 2016; Insight Assessment 2016). Furthermore, I requested the individual results to be sent to the participant's personal email for their own benefit as they can add it to their CV's in the future. The CCTST became a new hiring requirement trend and is considered as one of the innovative practices in many advanced working institutions. Furthermore, I have requested the Insight Assessment to send me all the results in one report without mentioning the names of the participants, but instead coded names were applied to assure confidentiality and privacy. Researchers recommended having anonymous respondents as participants so that the researcher cannot recognize the names of the participants (Cohen et al. 2007).

However, the researcher worked hard to guarantee accuracy, confidence and a high level of trustworthiness in the qualitative methods. Accordingly, the investigator followed Fraenkel and Wallen's (2008) several techniques and steps; recording her own thoughts while conducting the group interviews, unusual or improper replies to be checked later and compared with other comments, applying several forms of data including notes taken and audiotapes to avoid missing any portion of data. Finally, the contributors were asked about the transcripts of their own responses. Again, the researcher assured the confidentiality of the participants in the qualitative part. Researchers claimed that in best practice "although researchers know who has provided the information or can identify participants from the information given, they will in no way make the connection known publicly; the boundaries surrounding the shared secret will be protected" (Cohen et al. 2007, p.62).

The assessment tool's capability to satisfy the study objectives could be verified through the validity of the applied tool (Tavakol & Dennick 2011). Internal validity has been defined as "condition that observed differences on the dependent variable area direct result of the independent variable" ,degree to which the observed results represent the truth in the population" (Gay et al. 2009, p.295). External validity was defined as "the extent to which the results of a study can be generalized to and across populations, settings and times" (Johnson & Christensen 2014, p.200). Gay and colleagues (2009) categorized the external validity in three different classifications as population, operation, and ecological validity. Educational studies have significant potential validity threats that could be very hard to be excluded internally and externally (Creswell 2014). For example, researchers claimed that although the research tool is approved with good recognition in many previous studies, it is still hard for a researcher to predict or eliminate its internal validity in terms of the potential threats. The population and samples are subject to an external error in most of the educational studies (Creswell 2014). Accordingly, replication is considered as a core element for the educational studies to identify the expected validity threats (Johnson & Onwuegbuzie 2004).

It is worth it mentioning that Winter (2000) supported many researchers who claimed that the validity in the quantitative approach could support them to generalize the findings and results to broader groups while it is considered unimportant to tests in qualitative approach studies. Qualitative researches are interested in indicating the experiences of one particular culture (Glesne 2011). However, quantitative researches work on breaking phenomena in one culture into measurable groups that could be applied to all populations with similar circumstances (Winter 2000). Therefore, in conclusion, validity for wider populations is achieved through quantitative research.

To establish the trustworthiness, confidence, and accuracy of the questionnaire obtained data and to avoid misunderstanding of the questions, the researcher aimed to choose a trustable instrument that has been translated and was tested in different languages (Kaya, Şenyuva and Bodur 2017). The researcher is fully aware of her students' language barriers in the current multicultural background context and her main aim was to test their critical thinking skills regardless of their language abilities. Maintaining the validity of method items is an essential concern in this research and it is necessary that some items be changed in the “non-English language translations” within this culture. The CCTST user manual and resource guide highlighted that “much care has been taken, through collaborations with international scholars who are native language speakers and using rigorous iterative translation procedures to assure validity, reliability and cultural competence is achieved in all authorized translations” (Insight Assessment manual 2020).

### **3.7 Ethical Considerations**

The researcher started with the initial clinical setting SEHA permission processes that were expected to be very long soon after the proposal approval from the British University in Dubai. Meanwhile the internal college permission was expected to be easier as per the new college guidelines and policies to support the research. Being a research productive environment became a requirement as per the Commission of Academic Accreditation (CAA) accreditation standards

latest recommendations during their last visit in January 2018. A written approval consent and information sheet to the participants describing the study purpose of the focus group and the CCTST included the date and location of data collection. Creswell (2012) recommended the researcher to develop an informed consent form for participants to sign before they participate in the study. A pilot test with undergraduate and postgraduate nursing students similar to respondents recruited for the main study managed. The ethical approval needs to outline the participants' rights with their right to quit at any time, their voluntary participation, and their right to know the purpose of the study with no risk of harm to them.

Initial ethical approval was obtained from the college MD (manager director) and the nursing department head to go ahead with the study data collection after applying the official request through the proper channels. Based on the college protocols and standards, the college (Scientific Research Committee) needed to approve the study after submitting the official proposal that was submitted in June 2018 after gaining the study proposal approval from the British University in Dubai. The Institutional Review Board (IRB):

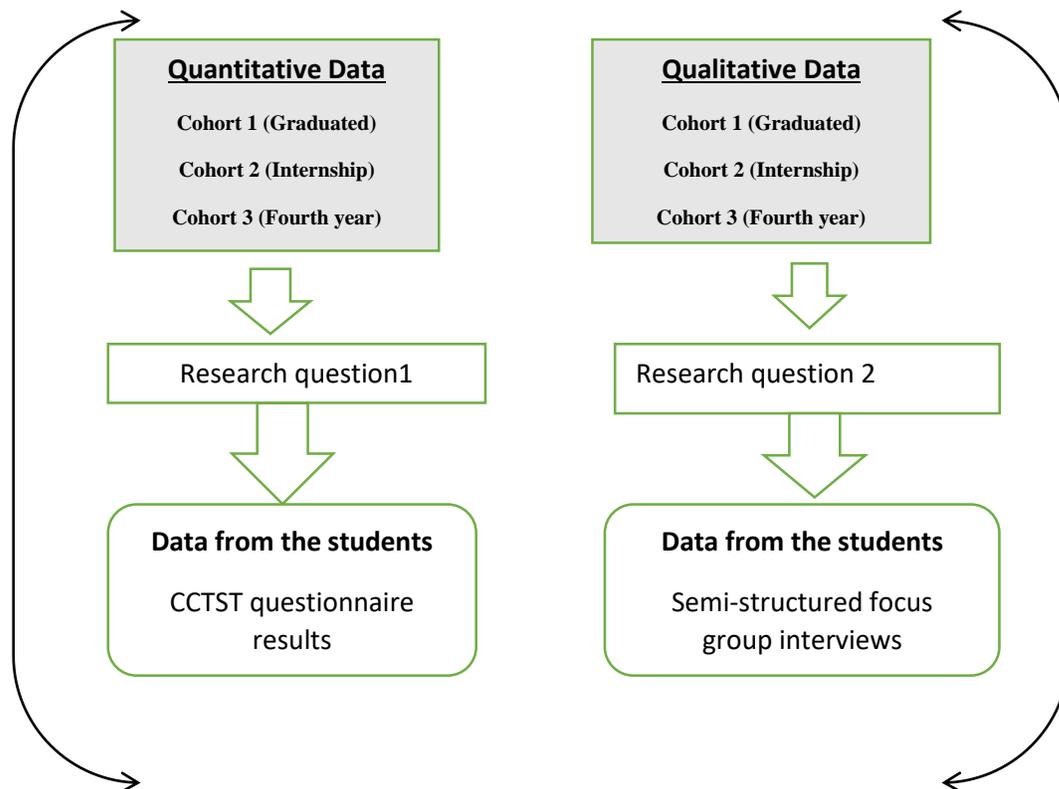
*“committee is responsible for reviewing proposals for studies planned to be carried out wholly or partially at the college by college staff or non-college staff. They evaluate compliance with international and local ethical standards and norms; assess the impact on staff, institutions, subjects, and resources; and recommend regarding approval, or otherwise, of planned study or research”* (college manual 2017 p.37).

Unfortunately, the Scientific Research Committee sent an email to the whole college apologizing for being unable to accept any research proposal request and put on hold the ones that have been received because of changing the committee's members. This change has made the researcher wait for an unexpected extra four months until the college management announced the new committee. After that, the new committee requested to resubmit the entire research proposals using new forms and following new protocols. Then, the new process delayed the study for another three months. The college's approval took five-months in total. Through that time, the researcher worked hard to gain SEHA permission and approval to run the study at the clinical settings with

the graduate students. SEHA ethical approval was obtained after the researcher was asked to conduct an introductory presentation in front of their panel to persuade them, outlining the research's aim, objectives, and methods. All the needed approval forms were submitted through SEHA research committee management after receiving the acceptance email three weeks from passing the introductory presentation. All the application forms and the acceptance letters are available at the appendix list.

## Chapter 4: Data Analysis and Results

This chapter presents the findings drawn from quantitative and qualitative data of this study. The quantitative data were utilized from the California Critical Thinking Skills Test (CCTST) form B (2019). The questionnaire was set out to investigate the three nursing cohorts; Graduates, Internship, and fourth-year critical thinking, moral reasoning, and cultural sensitivity quality, and it presented the scores of the essential domains of thinking, Overall, Analysis, Inference, Evaluation, Induction, and Deduction. The qualitative data of the semi-structured focus group interviews meant to explore the three cohorts' preparations of critical thinking, moral reasoning, and cultural sensitivity on their clinical training. Quantitative and qualitative results were also integrated into the summary of the results as shown in the graphical demonstration of result path figure below (13).



*Figure 13 Graphical Demonstration of Result Path*

The study aimed to examine the participants' quality of clinical decision-making among the UAE nursing students and graduates within culturally competent care. Furthermore, the study aimed to explore the deep understanding behind the participants' preparation of critical thinking, moral reasoning, and cultural sensitivity about their curriculum and clinical preparation after being instructed and assessed authentically. This is a concurrent mixed-method study where the researcher needs to explore critical thinking among three nursing cohorts. The researcher adopted the Statistical Package of the Social Science (SPSS 22.0), a statistical analysis software program, to analyze the (CCTST) results along with the thematic analyses for the qualitative method to answer the below research questions:

1. What impact does the nursing education curriculum have on three different nursing cohorts (undergraduate students, internship, and graduate) in terms of critical thinking, moral reasoning in the UAE?
2. What influence, if any, does the workplace preparation have on the three different nursing cohorts' practices concerning critical thinking, moral reasoning, and cultural sensitivity in the UAE?

The first question is about statistical significance as the researcher examined the differences between the scores of critical thinking for the three nursing cohorts. The study used the (CCTST), which assessed the overall and the five domains (sub scores) of critical thinking: analysis, induction, deduction, evaluation, and inference. Analysis of variance (ANOVA) is a statistical technique that is used to check if the means of two or more groups are significantly different from each other. However, all the assessment instruments produced by Insight Assessment meet the threshold for strong internal consistency reliability based on Cronbach's Alpha reliability test with (a minimum Alpha of 0.80). The researcher used CCTST for adopting highly reliable questionnaire standards. The details at the CCTST manual "provide all information relating to the validity and reliability of Insight Assessment's instruments. Major topics include content, construct, criterion (predictive) validity, internal consistency, and test-retest reliability. Included are hyperlinks to published research reports about the validity and reliability of the instruments" (for more elaborations and additional examples from the literature see Appendix A).

However, quantitative and qualitative results were integrated into the results summary, and the study will discuss these in the following chapter.

## **4.1 Quantitative data analysis and results.**

### **4.1.1 Demographic results**

The CCTST questionnaire was utilized to address the first research question of the study, which is what impact does the nursing education curriculum have on three different nursing cohorts (undergraduate students, internship, and graduate) in terms of critical thinking, moral reasoning, and cultural sensitivity in the UAE? The researcher used a convenient sample of 103 participants from a health sciences education institution in Abu Dhabi that teaches a bachelors nursing degree (BSc) in four years' for the undergraduate curriculum. The (103) participants from the three cohorts were undergraduate students including all the fourth-year nursing students (N = 57) enrolled on the BSc nursing program. Also included were the internship seniors (N = 24) undertaking a one-year internship training program at the hospitals. Finally, graduate students with one-year experience or more (N = 22) and employed at the hospitals and working independently were included. To investigate reliability and content validity, the researcher selected the participants that had the same background in education curriculum and clinical preparations.

The Health Authority of Abu Dhabi (HAAD) and Abu Dhabi Nursing colleges in the UAE both offer the same nursing curriculum and conduct practical training for the students, internship, and employed graduates. Nursing colleges in Abu Dhabi were chosen to be included in this study as they educate and hire national Emirati and expatriate students. They tend to offer the same nursing courses and preparations for equivalent student populations who have similar characteristics in the UAE. Moreover, to ensure consistency among the three cohorts, all the

participants received the same instructional content and tested through the same CCTST questionnaire (form B). The participants from the three nursing cohorts in the analysis of the demographic data revealed that they were similar in most respects. As such, the participants had the same gender, as all of them (100 %) were females. Arabic is the primary spoken language for all the participants.

Demographics of the study include three variables: the cohorts of undergraduate students, internship, graduate, age, and marital status. First, concerning the cohorts, the highest number of the participants was (57) of whom 55.3% were in the fourth year, and the mean ages for the participants were comparable, as the majority of the participants' ages ranged from 18 to 42 years with a mean of 24.02 years and a standard deviation (S.D) of 4.63 years. Next was the internship group (24) while the minority was within graduates (22) with 21.4%, and 23.3%, respectively. However, the 103 participants' age groups were between (18- <26), (26- <34), and (34- 42) with n =77, n =20 and n = 6, respectively. In addition, the majority within the three age groups fell between 18 and 26 years (74.8%), followed by the participants who fell into the 26- 34 age groups while the minority fell into the age group between 34 and 42 (19.4 % and 5.8 % respectively). Finally, for the participants' marital status, the majority were single. Most of the participants started their nursing education right after they graduated from high school that explains why 69% of them were single and 31% were married. The number and percentage distribution of participants regarding their characteristics (N=103) is displayed in the tables below (4.1) and sociodemographic information (figure 14).

Items	N	%
<b>Cohort</b>		
(Graduated)	22	21.4
(Internship)	24	23.3
(Fourth year)	57	55.3
<b>Age</b>		
18- <26	78	75.7
26- <34	18	17.5
34- 42	7	6.8
Mean S. D	24.02±4.63	
<b>Marital status</b>		
Single	71	69%
Married	32	31%

Table (4.1): Demographic results.

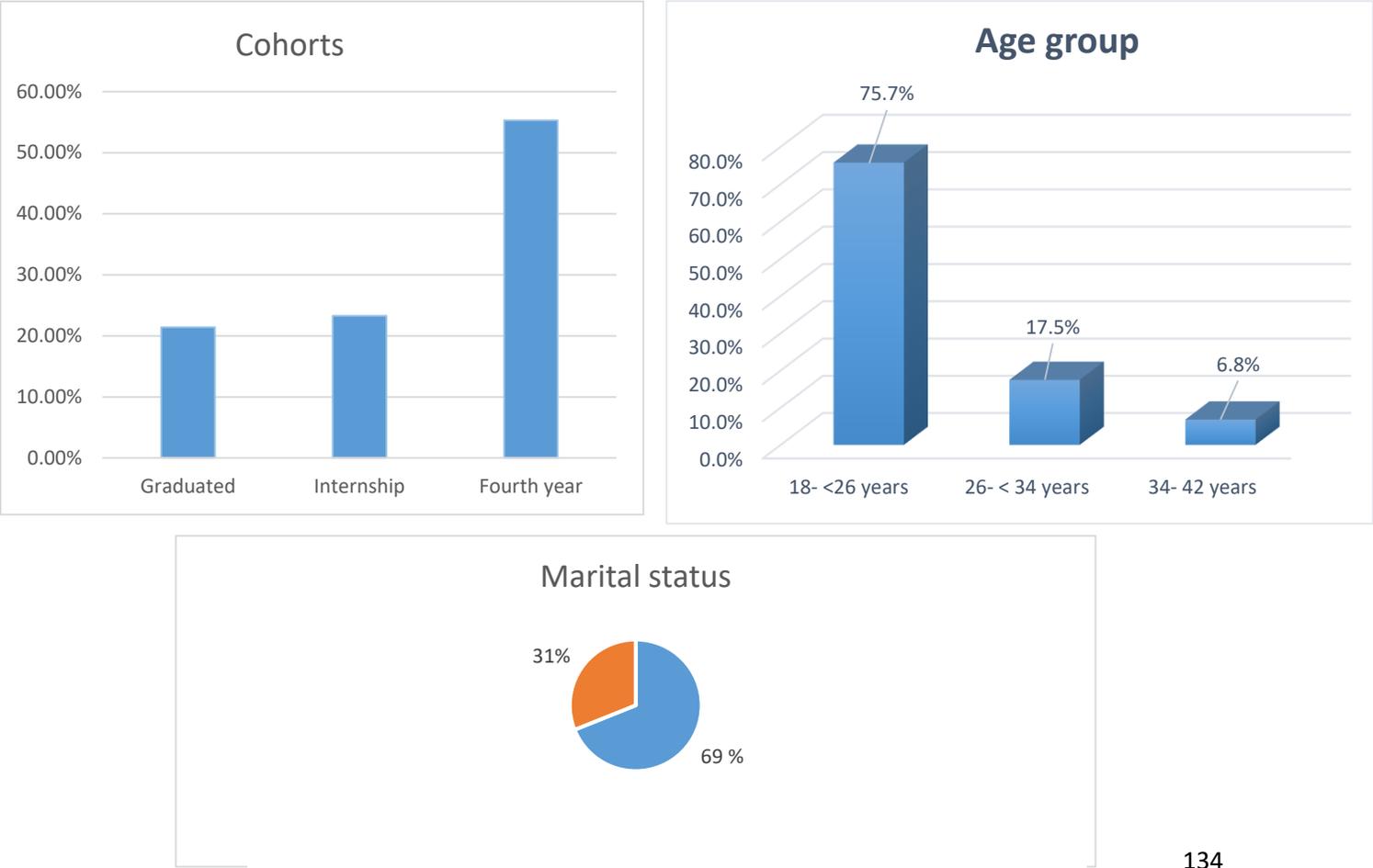


Figure 14 Sociodemographic data (cohort, Age and Material status).

#### 4.1.2 Factor Analysis

<b>CCTST domains</b>	<b>No</b>	<b>mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>SE Mean</b>
<b>Overall</b>	103	11.17	3.113	4	24	0.31
<b>Analysis</b>	103	3.30	1.312	0	7	0.13
<b>Inference</b>	103	4.80	1.828	1	11	0.18
<b>Evaluation</b>	103	3.07	1.542	0	9	0.15
<b>Induction</b>	103	6.49	2.287	2	14	0.23
<b>Deduction</b>	103	4.68	1.699	1	10	0.17

Table (4.2): Analysis of the CCTST domains.

Factor analysis is defined as “a statistical technique used to identify a relatively small number of underlying dimensions, or factors, which can be used to represent relationships among interrelated variables,” and provides a geometrical demonstration (Niranjan 2004 p.30).

Accordingly, in this study factor analysis was conducted based on the specified CCTST six domains (factors), namely: Overall, Analysis, Evaluation, Inference, Inductive and Deductive Reasoning (Insight Assessment 2019; Insight Assessment 2020). Researchers have argued that CCTST internal consistency method shows that all critical thinking domains have high and positive correlation with total test score (Khalli & Zadeh 2003).

To interpret the strength of the overall score, using the cut-point (scale) scores that correspond to the version of the test administered using the CCTST 34-point version cut scores “the overall scores for individual test-takers ranges from 7 to 31. The test taker score of 7 corresponds to the recommended performance assessment of Not Manifested. The test taker score of 31 on the 34-

point version of the CCTST demonstrates superior overall skill in critical thinking” (Insight Assessment 2020 p. 48).

Based on the above, the researcher was not able to present the 34 items of the CCTST as per the Insight Assessment policy (see Appendix A). Instead, the breakdown of these domains is acceptable as it reflects that the 34 items are acceptable. Accordingly, the overall score of the critical thinking and its five domains results are provided for the factor analysis in the below table (4.2).

The table presents that the (N=103) participants', Overall has the highest mean = 11.17 followed with Induction, Deduction and Inference 6.49, 4.68 and 4.80, respectively. The highest SD = 3.113 was for the overall, and the lowest SD= 1.312 was for the Analysis among all the participants. The Overall presented the highest mean, SD, Min, Max, Median and SE Mean among all the other domains. The highest score for the Overall was Max =24 with an SD = 3.113 and a Mean =11.17, Median=11 and Min= 4. This was followed by Induction, Inference and Deduction with 14, 11, 10, respectively. Analysis and Evaluation were the lowest Min=0 for both, followed by both Inference and Deduction Min=1. However, the Overall was the highest Min= 4 among all the domains. The highest median was 11 for the Overall and the lowest median were 3 for both Analysis and Evaluation. The Median was the same (= 5) for Inference and Deduction. Moreover, Overall had the highest SD = 3.113 followed by SD = 2.287 for Induction, then the Inference, Deductive, Evaluation and Analysis SD = 1.828, 1.699, 1.542, and 1.312, respectively.

### **4.1.3 Reliability Tests**

This study calculated the internal consistency using the Kuder -Richardson-20 tool for assessing reliability. The construct validity was determined through factor analysis, internal consistency and group differences. The statistical analysis was made with the SPSS version 22.

The CCTST team argued that content validity refers to a ‘test's ability to capture a measure of the intended domain’. The test validity and reliability coefficients meet the highest standards for all instruments. Furthermore, the CCTST items were piloted in board samples and have been

validated in replicated studies over the past 25 years. The Multiple-choice questions that measured reasoning skills are the outcomes of an element pool tested over 40 years to describe item difficulty and scale membership that started in the 1970s to detect item difficulty and scale membership (Insight Assessment 2020 p. 49).

Moreover, the CCTST appropriate internal consistency reliability coefficient for the reasoning skills tools is the Kuder-Richardson test because scoring for these tools is dichotomous. However, KR-20's of .70 are trusted evidence of strong internal consistency measures. This level of internal consistency is the standard used for the development of Insight Assessment critical thinking skills instruments (Insight Assessment 2019). The overall scores of all distributed versions of the reasoning skills tests meet or exceed this .70 criterion in the validation samples, and in large model population samples. KR statistics in this range are typically observed in independent samples when the sample size and variance are adequate and factor loadings for items range from .300 to .770 (Insight Assessment 2019; Insight Assessment 2020).

According to the National League of Nursing instructions, they guided the nursing universities in evaluating their students' critical thinking skills before graduation through an effective, valid, and standard tool to assess the students' problem solving and decision-making skills (Khalli & Zadeh 2003). To control the test validity, the CCTST was translated and modified by Arabic and English language professional professors and expert researchers. Currently, the CCTST serves assessment needs in nearly 70 countries in 25+ languages. This study employed the CCTST test that was translated into Arabic and English language versions. The main reason this was done was to ensure the full apprehension of the test and to make certain that no time is wasted on impractical reading and understanding of what is being stated. Then, the test was established by the decisions of a panel of medical education experts and psychology professors. CCTST reliability was determined with internal consistency and use of KR-20.

Cronbach's Alpha is an appropriate internal consistency coefficient for all measures of critical thinking and leadership. However, all the produced assessment instruments by the Insight Assessment meet the threshold for strong internal consistency reliability (a minimum Alpha of 0.80). They are observed to maintain this performance in all samples of adequate variance (Insight Assessment 2020 p.66). Over the past 15 years, strong values were observed consistently in

samples collected (ranging .60 - .78 on the scales and .90 or above for the overall measure) (Insight Assessment 2020 p.68-69) (See Appendix A).

Test-retest reliability for all tools distributed by Insight Assessment exceeds .80 in samples with an adequate variance retested at two weeks post pretest (Insight Assessment 2020 P. 30). Many examples validated no change after long intervals when no active training in critical thinking has occurred between pretest and posttest. In summary, testing tools produced by Insight Assessment have met the limit for solid internal consistency and reliability (a minimum Alpha of 0.80 for attribute measures and a minimum KR-20 of .72 for skills measures) (Insight Assessment 2020 P. 31).

Furthermore, this study's Cronbach alpha was calculated for CCTST that included 6 variables (domains) of the 34 items. Cronbach's alpha for the 6 domains was reported to be .853 and (M= 33.50, SD=9.338) for the CCTST domains (overall, analysis, evaluation, inference, inductive and deductive reasoning) as it is shown at the below table (4.3).

<b>Reliability statistics</b>					
<b>No. of CCTST domains</b>	<b>Cronbach's Alpha</b>	<b>Mean</b>	<b>SD</b>	<b>minimum</b>	<b>maximum</b>
<b>6</b>	<b>.853</b>	<b>33.50</b>	9.338	12	72

Table (4.3): Cronbach's alpha for the CCTST

#### **4.1.4 Descriptive statistics**

To ensure consistency among the participants and assure their abilities to set for the CCTST assessment tool, this study confirmed that all the three nursing cohorts had received the same educational resources (Kaddoura 2011). In addition, the tutorial they used to work in groups to discuss the given case scenarios to come up with solutions for the questions the teacher posed correlated to the assigned cases. Over the four years of teaching and learning at the college, the nursing students were introduced to various complex health problems that presented in different courses such as medical-surgical, cardiovascular, pediatric and maternity, leadership, community,

culture and the transition to practice in nursing. The lecturer's role as a facilitator is ensure students understand the content and are ready by participating in making proper decisions. However, the traditional teaching include critical thinking questions within the written exams using many creative scenarios from the real-life cases in the clinical settings. The CBL discussion work to encourage the students with various scenarios to elaborate more solutions to prepare the students to practice good decision making and ethical clinical judgments. All these efforts were intended to help the nursing students to achieve similar goals by discovering and constructing knowledge instead of just transferring the experience to the students. The UAE Commission on Academic Accreditation of the Ministry of Higher Education and Scientific Research had accredited this entire course syllabus. The nursing college was affiliated with two famous Australian universities for international accreditation requirements.

Accordingly, the CCTST form (B) was used to collect the raw data of the nursing critical thinking abilities from the three cohorts. CCTST is a challenging and intelligently standardized (34 item multiple-choice) instrument that runs over 45 minutes to investigate the participant's cognitive abilities (Insight Assessment 2019). The CCTST user manual and resource guide (2020, p.10) revealed that this exam should be managed over 45- 55 minutes: "The time remaining to complete the test is provided to the test-takers, helping them to manage the available time" and cannot be administered in less than 45 minutes. The CCTST necessitates time for "reflective judgment about which response is correct and which responses involve reasoning errors. The time needed to read the items on the CCTST has been measured at 15 minutes on average. Responding thoughtfully to the items on the CCTST demands more than 15 minutes of cognitive effort". The test items are based on common themes proposed to be of "short, discipline-neutral content; problem statements; and scenarios grouped into five domains including analysis, evaluation, inference, inductive and deductive reasoning and the overall ( Facione 2006; Kaddoura 2011: Kaddoura 2017; Insight Assessment 2020 ). Taking less than 15 minutes is usually a sign that the test taker answered randomly instead of carefully choosing answers. Occasionally CCTST grasps errors due to an interruption of the internet connection between the computer/mobile device being used by the test taker and the testing server (Insight Assessment 2020).

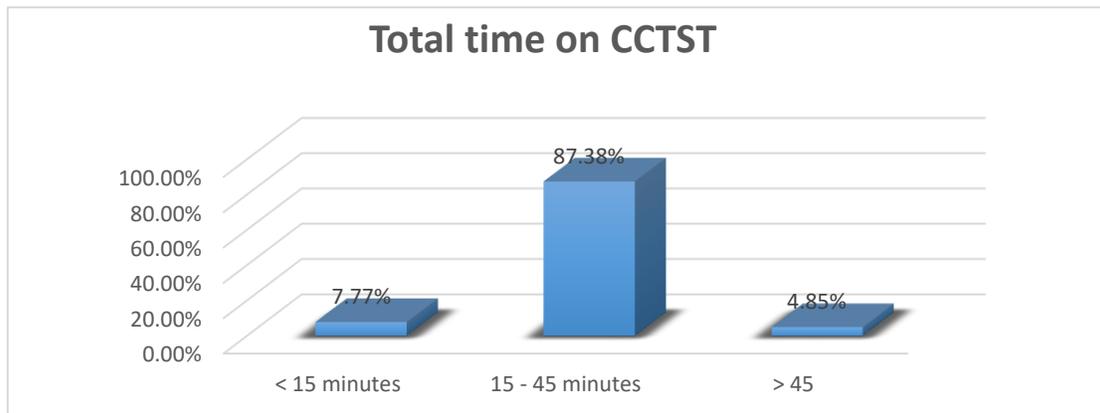
To investigate the effect of the time spent on answering the CCTST by the participants on their performance, the researcher first explored the time differences spent on the exam by the

participants. The study found that out of (N=103) the majority 90 of the participants used (15 - 45 minutes) and 8 spent (< 15 minutes) minutes. While only 5 participants spent (> 45 minutes) with Mean SD of 34.87±11.53. However, the results showed that most of the participants finished their test within the period of 15 – 45 minutes with an average of 87.38%. Meanwhile 4.85% took a very long time of over 45 minutes to complete the test, and 7.77% took the range of 45- 55 minutes as illustrated in the below table (4.4) and (figure 15).

Nevertheless, the outcomes were surprising, as the participants were able to complete the MCQs within the granted period. It is worth mentioning that the CCTST guided the participants about the consumed and the remaining time during the test. The CCTST displayed the remaining time presented for finishing the assessment on each question screen to help the participants to utilize their time wisely (Insight Assessment 2019).

Minutes on test	No	Percentage
< 15 minutes	8	7.77%
15 - 45 minutes	90	87.38%
> 45 minutes	5	4.85%
Grand Total	<b>103</b>	<b>100%</b>
Mean S. D	34.87±11.53	

Table (4.4): Percentage distribution of participants related to minutes of CCTST scale



**Figure 15** Percentage distribution of participants related to minutes of CCTST scale.

#### **4.1.4.1 Time Consumed on answering CCTST in Minutes by Educational Level**

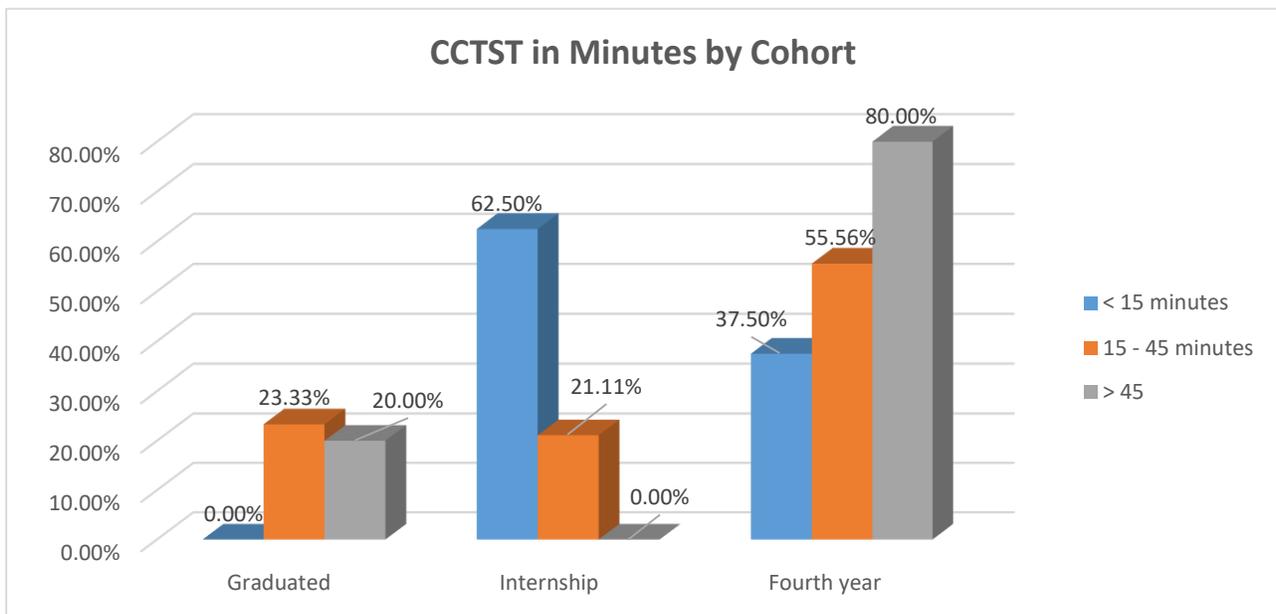
The participants were classified based on their educational level into three groups; graduates, interns, and fourth-year students. The CCTST is a challenging test of 34 multiple-choice questions that should run over a 45-minute period, and the participants were familiar and trained during their nursing curriculum study at the college to answer such critical questions. The researcher anticipated that the given time was more than enough to provide these well-trained participants to complete the questions entirely (Raymond, Profetto-McGrath, Myrick & Streaan 2018). Accordingly, the CCTST is a challenging and logically standardized instrument to investigate the participant's cognitive abilities (Insight Assessment 2019). The CCTST resource guide revealed that the time remaining to complete the test was provided to the test-takers, helping them to manage the available time. The CCTST requires time for reflective judgment about which response is correct, and which responses involve reasoning errors. Responding thoughtfully to the items on the CCTST demands more than 15 minutes of cognitive effort. The test items are based on common themes proposed to be of "short, discipline-neutral content; problem statements; and scenarios grouped into five domains including analysis, evaluation, inference, inductive and deductive reasoning and the overall (Kaddoura 2011: Insight Assessment 2020 ). The time consumed in answering CCTSTs and in choosing correct answers reflected the participant's cognitive skills and presented their critical thinking and moral judgment that helped in answering the first research question and find the impact of the nursing education curriculum preparation on three different nursing cohorts in terms of critical thinking and moral reasoning.

The majority of the (N= 103) participants finished their tests within a period of 15 - 45 minutes were fourth-year students with an average (55.56%), followed by the interns and graduates with an average 23.33% and 21.11%, respectively. The participants who finished their test within the ranged period of (> 45 minutes) minutes were 80.00% from the fourth year, and 20.00% from the graduates. No 0.00%, interns took a very long time to answer the CCTST. However, 62.50% of the interns and 37.50% of the fourth-year students spent (< 15 minutes), while 0.00% from the graduates.

In conclusion, the majority of the students fell at the (15 < 45) time from all the educational levels and very few took more the 45 minutes to answer the CCTST, as illustrated in the below table (4.5) and time consumed on answering CCTST in minutes by educational level (figure 16).

Level of education n=(103)	Count of Minutes on test					
	< 15 minutes		15 - 45 minutes		> 45 minutes	
	No	%	No	%	No	%
Graduated		0.00%	21	23.33%	1	20.00%
Internship	5	62.50%	19	21.11%		0.00%
Fourth year	3	37.50%	50	55.56%	4	80.00%

Table (4.5): Participants' time consumed on answering CCTST speed in minutes by educational level



**Figure 16** Time Consumed on answering CCTST in Minutes by Educational Level

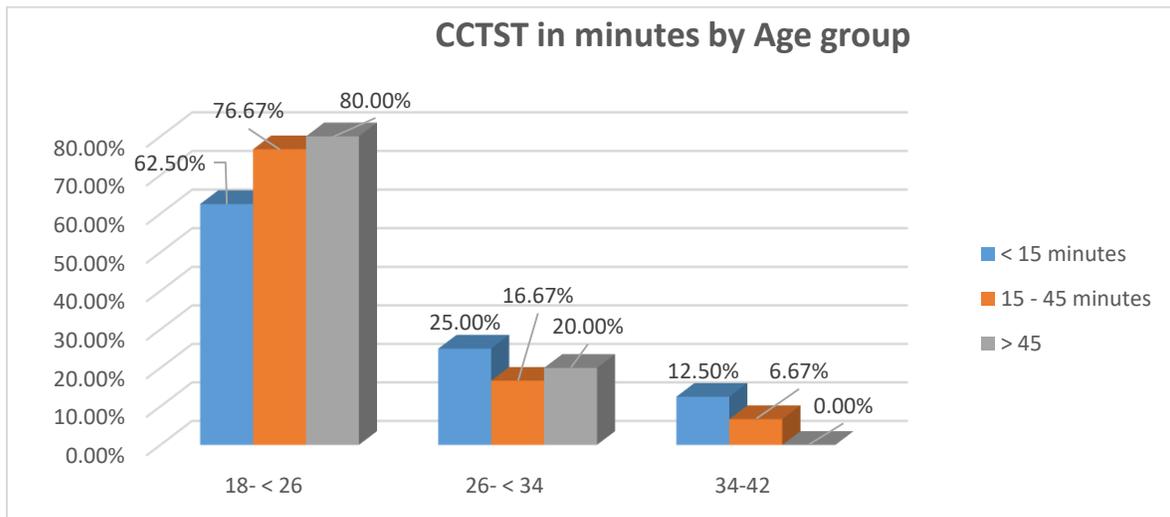
#### 4.1.4.2 Time Consumed on answering CCTST in Minutes per Age group.

The study had (N=103) participants who were categorized based on their age into three different age groups (18 - < 26), (26 - <34), and (34- 42). The majority of the participants who finished their CCTST exam at (15 < 45) minutes fell within the age group 18 - < 26, followed by 26 - <34 years, and 34- 42 years with an average of 76.67%, 16.67%, and 6.67%, respectively. The majority of the students who spent < 15 minutes on the CCTST exam fell within the age group 18 - < 26, followed by 26 - <34 and 34- 42 with an average of 62.50%, 25.00%, and 12.50%, respectively. In addition, 1 participant from the age group 34- 42 spent < 15 minutes with an average of 12.50%, and another participant spent a long time, > 45 minutes, from the age group 26 - <34 with an average of 20.00% to answer the CCTST questions.

However, the participants from the age group 18 - < 26 mostly were able to adjust their time to answer the CCTST, as illustrated within the below table (4.6) and participants' consumed time on answering CCTST in minutes per age group (figure 17).

Age n=(103)	Count of Minutes on test					
	< 15 minutes		15 - 45 minutes		> 45 minutes	
	No	%	No	%	No	%
18 - < 26	5	62.50%	69	76.67%	4	80.00%
26 - <34	2	25.00%	15	16.67%	1	20.00%
34- 42	1	12.50%	6	6.67%		

Table (4.6): Participants' consumed time on answering CCTST in minutes by Age group.



**Figure 17** Participants' consumed time on answering CCTST in minutes per Age group.

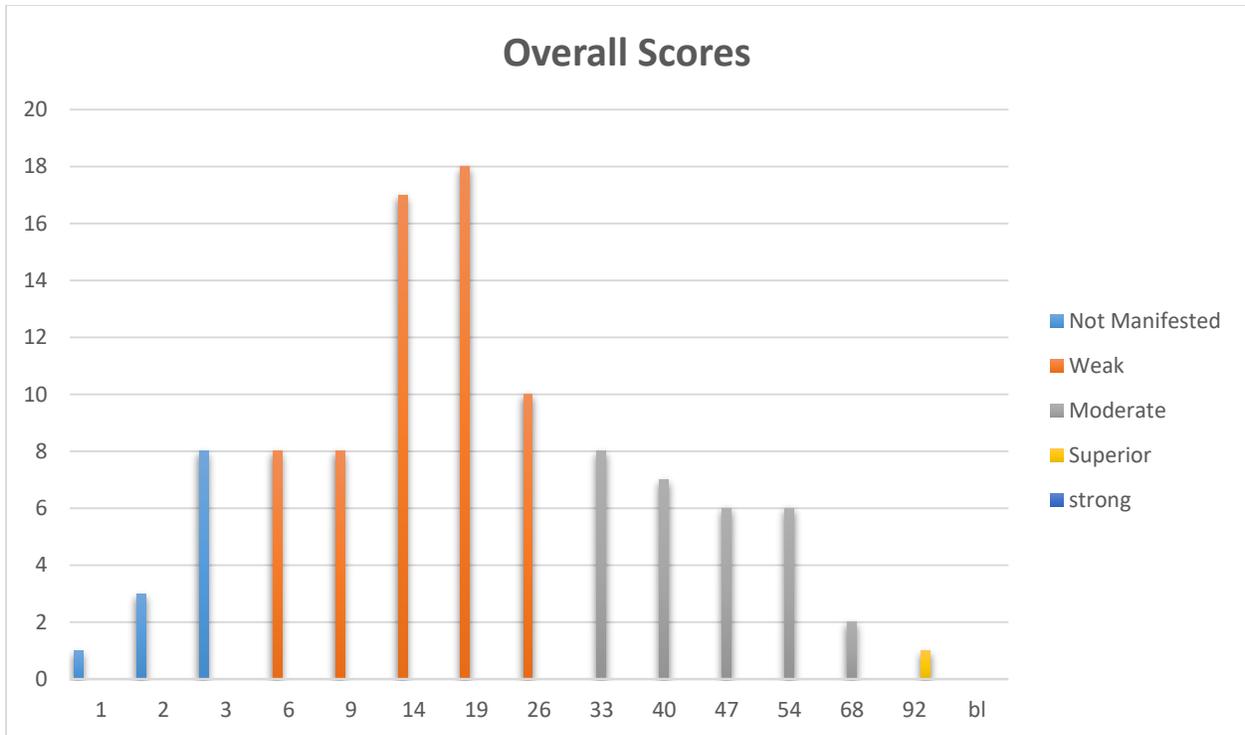
#### 4.1.4.3. Descriptions of the OVERALL Score

Based on the CCTST instrument benchmark scores, the overall cut-point scores specific CT skill scores are determined to be (Superior  $\leq 24$ , Strong 19-23, Moderate 13-18, Weak 8-12, or Not Manifested 0-7), and are based on both internal data analyses from available datasets as well as independent research reporting the relationship between scores and external performance variables. The other five domains (sub-scores) range scale scores are Strong  $< 5$ , Moderate 3-4, and Not Manifested 0-2 for analysis, respectively. The evaluation range scores were Strong  $< 3$ , Moderate 4-7, and Not Manifested 0-3. Meanwhile the inference, inductive and deductive cut-point scores are Strong  $< 12$ , Moderate 6-11, and Not Manifested 0-5 (Insight Assessment 2020 p. 28). The Overall results of this study demonstrated that out of (n=103) participants, the majority were at the Weak level with a total of 61 participants. The minority reached the Superior level as only one participant scored extremely high at the Superior level. The Weak level was distributed among the participants as; 10 scored 26 and 18 participants scored 19 percentile, followed by 17 scored 14, while 8 participants scored 9 and another 8 scored 6. However, at the Moderate percentile level, a total of 29 participants reached this level. The Moderate level was spread among the participants as 2 participants scored at 86 percentile, then 6 scored 54, and another 6 scored 47, followed by 7 and 8 participants who scored 40 and 33 respectively. Then, the Not manifested

level has 12 participants as 8 were at 3 percentile, followed by 3 and 1 participants at 2 and 1 percentile level, respectively. Finally, none of the participants scored at a Strong level, as presented at the below table (4.7) and descriptions of the OVERALL score. (Figure 18).

Percentile	Overall				
	Not Manifested	Weak	Moderate	Superior	Strong
1	1				
2	3				
3	8				
6		8			
9		8			
14		17			
19		18			
26		10			
33			8		
40			7		
47			6		
54			6		
68			2		
92				1	
<b>Grand Total (N = 103)</b>	<b>12</b>	<b>61</b>	<b>29</b>	<b>1</b>	

Table (4.7): Descriptions of the OVERALL Score.



**Figure 18** OVERALL Score Distribution.

#### 4.1.4.4. Interpreting the Strength of Overall Score and the Percentile

The percentile score reports the corresponding national percentile score for the standard group that was designated by the assessment superintendent. The CCTST score package includes a holistic measure of critical thinking OVERALL score, benchmarked against a population comparison percentile score, and individual scale scores for the domains of cognitive skills identified as core skills in critical thinking (Khallli & Zadeh 2003). “Using the national percentile score provides a benchmark for selecting applicants who compare well with the population of students working toward the same degree or credential. A cohort of students nearing the end of their professional development program and compare their scores for CCTST OVERALL with the national comparison percentiles in that same profession. Based on the CCTST instrument benchmark scores, the OVERALL specific CT skill scores are determined to be (Superior  $\leq$  24,

Strong 19-23, Moderate 13-18, Weak 8-12, or Not Manifested 0-7)” (Insight Assessment 2020. P 27).

Table 4.8 shows that the majority of the participants have a Weak percentile, which ranged from 8-12 of the overall score, followed with a Moderate percentile, while only one student was superior compared to the benchmark scale of the national percentile score. The first three rows (Red) present the participants who completed the CCTST and had OVERALL scores that were interpreted as Not Manifested. This score would place the student at the 1st, 2nd, and 3rd percentile nationally compared to other participants involved in similar programs. The next five rows (orange) present the participants who completed the CCTST and had OVERALL scores that were interpreted as Weak. This score would place the participants at the 6th, 9th, 14th, 19th, and 26th percentile nationally when compared to other students involved in similar programs. The next five rows (Yellow) present the participants who completed the CCTST and had OVERALL scores interpreted as Moderate. This score would place the participants at the 33rd, 40th, 47th, 54th, and 68th percentiles nationally when compared to other students involved in similar programs.

None of the participants scored at the Strong (Green highlight). Finally, (Blue) presents a participant with a CCTST OVERALL score of 92 (Superior) with a CCTST OVERALL score of 24. This score is at the 92nd percentile when compared to the selected national comparison.

<b>Overall score</b>	<b>UAE CCTST Percentiles</b>	<b>Qualitative Rating</b>	<b>Total N=(103)</b>
4	1 <sup>st</sup>	<b>Not Manifested</b>	1
6	2 <sup>nd</sup>		3
7	3 <sup>rd</sup>		8
8	6 <sup>th</sup>	<b>Weak</b>	8
9	9 <sup>th</sup>		8
10	14 <sup>th</sup>		17
11	19 <sup>th</sup>		18
12	26 <sup>th</sup>		10
13	33 <sup>rd</sup>	<b>Moderate</b>	8
14	40 <sup>th</sup>		7
15	47 <sup>th</sup>		6
16	54 <sup>th</sup>		6
18	68 <sup>th</sup>		2
19-23	0	<b>Strong</b>	
24	92 <sup>nd</sup>	<b>Superior</b>	1

Table (4.8): A Percentile score for a national comparison group

#### **4.1.5 Inferential analysis**

The goal of the inferential statistics is to draw conclusions from the three cohorts' sample and generalize them to the nursing students and graduates within the UAE population. The Pearson correlation coefficient (Pearson R test) was utilized to measure the relationship strength between variables and find the coefficient value, ranging from -1.00 and 1.00. The value = 1 means a perfect positive correlation, and the value = -1 means a perfect negative relationship. In order to examine the impact of the nursing curriculum and workplace preparation on the participants CT global scores and its domain ANOVA was utilized. Participants were divided into three cohorts from three different age groups as shown in the paragraphs and tables below:

##### **4.1.5.1. Results of CCTST Domains (Overall, Analysis, Inference, Evaluation, Induction, and Deduction) Scores by Educational Level**

Leibold (2018) draws attention to the fact that critical thinking and clinical reasoning are of paramount importance to ensure safe and high-quality care. In addition, they are a profitable, thriving learning experiences, and essential predictors of success in life and work. Over the past 25 years, the CCTST has proven to be a very thoughtful way to measure the critical thinking of many members within the society such as students from different age groups and adult employees from all types of workplaces (Khalli & Zadeh 2003).

This study utilized the CCTST to measure participants' six domains: overall, analysis, inference, evaluation, induction, and deduction. The United States-based company Insight Assessment took the role of administering the test after many communications with the researcher of the current study. They have collected and deeply analyzed the raw data and provided the author with the individual overall score as well as scores per dimension. The CCTST team guaranteed that each individual would have a clear explanation for each score in terms of score descriptions. Thus, at the end of the test, the participants' scores sent to the researcher using anonymous ID were guaranteed to ensure privacy.

Initially, the overall score describes total strengths and weaknesses in using reasoning to form reflective judgments about 'what to believe or what to do' Achieving high scores in the five domains core reasoning skills could lead the participant to achieve a high overall score to indicate good decision-making and thoughtful problem solving (Insight Assessment 2020).

The first domain score is analysis, where the individuals can investigate the reasoning skills from the 'charts, graphs, diagrams, spoken language' to examine how they interrelate in the development of arguments. Then, inference skills were the CCTST offer the exam taker thoughtful ideas, a set of evidence and situations, and hypotheses to draw conclusions, decisions, and possible values from reasons and pieces of proof. Next, evaluative reasoning skills, to conclude the opinions behind the claims made and the conclusions reached. That could be accessed through judging the quality of 'analyses, opinions, beliefs, and decisions' by providing the evidence and reasons (Insight Assessment 2019). After that, inductive reasoning, where people make their decisions constructed on case studies, prior experience, statistical analyses, simulations, events, experiences, and behaviors. However, deductive reasoning depends on exacting accuracy that leaves no room for uncertainty from the anticipated truth of 'beliefs, values, policies, principles to a conclusion that cannot be false if those beliefs are true' (Insight assessment 2019 .p.6).

The convenient sampling that was selected the representative participants helped in testing and building the theories concerning the wider population, provide useful information about the phenomena (Creswell 2014; Fraenkel & Wallen 2012). The sample examined the three nursing cohorts at the same time in 2019. The three nursing cohorts were the fourth-year students (n =57) who still attended the college, were mature and could provide the study with constructive feedback about their preparation over the four year curriculum. The interns (n =24) were under both the hospital and the college's supervision during their transition phase to be independent in their coming years. Finally, the nursing graduates with one-year experience and more (n =22) who left from the college and they were under the hospital's supervision could reflect on the workplace preparation on CT, MR, and CS purely. Accordingly, the total quantitative study sample is 103 female Arabic nursing students and nursing graduates.

The paragraphs and tables below present the results from the CCTST scores for the three cohorts;

As shown in Table 4.8 below, the results demonstrate the range in critical thinking total scores and the five domains scores that there were no statistically significant differences for the CCTST between graduates, interns, and fourth-year students. However, the pattern of mean and max of the CCTST overall and the five domains scores appeared to demonstrate an increase as the educational level increased. The data shows no significance between the means score of CCTST scale between three groups indicated with a p-value less than 0.05.

The table also shows that graduate nurses had higher scores in all domains than interns and fourth-year students. The fourth-year students had higher mean at overall, analysis, inference domains than internship group except for evaluation and deduction. The minimum overall critical thinking scores and the minimum domain scores showed little variability, except for the inference and the overall scores. The maximum total critical thinking scores ranged from 5.00 to 24.00, with the highest score being achieved by the graduates.

However, the table reveals that the overall mean score of graduates was  $12.23 \pm .77$ . Also, the mean score for analysis was  $3.36 \pm .24$ . Furthermore, the maximum score for inference was 11 with mean a mean of score  $5.36 \pm .41$ . Meanwhile, the mean score for evaluation was  $3.50 \pm .44$  and the mean scores for induction and deduction were  $7.50 \pm .57$  and  $4.73 \pm .37$ , respectively. In addition, the table reports that the overall mean score of intern subjects was  $10.75 \pm .58$  and maximum score for analysis was 6 with a mean score of  $3.13 \pm .30$ . The mean score for inference was  $4.63 \pm .41$ , while the mean score for evaluation was  $3.00 \pm .28$ . The mean scores for induction and deduction were  $6.29 \pm .44$  and  $4.46 \pm .34$ , respectively. Finally, the table demonstrates that the overall mean score of fourth year students was  $10.93 \pm .39$  and the minimum score of analysis was 1 with a mean score of  $3.35 \pm .17$ . The mean score for inference was  $4.65 \pm .22$ . Meanwhile, the mean score for evaluation was  $2.93 \pm .17$  and the mean scores for induction and deduction were  $6.18 \pm .27$  and  $4.75 \pm .22$ , respectively.

<b>Variable</b>	<b>Group (N=103)</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>	<b>F</b>	<b>P. value</b>
<b>Overall</b>	Graduated	7	24	12.23	.77	1.679	.192
	Internship	7	18	10.75	.58		
	Fourth year	4	18	10.93	.39		
<b>Analysis</b>	Graduated	1	5	3.36	.24	.278	.758
	Internship	0	6	3.13	.30		
	Fourth year	1	7	3.3±.17	.17		
<b>Inference</b>	Graduated	3	11	5.36	.41	1.360	.261
	Internship	1	10	4.63	.41		
	Fourth year	1	8	4.65	.22		
<b>Evaluation</b>	Graduated	0	9	3.50	.44	1.118	.331
	Internship	1	6	3.00	.28		
	Fourth year	0	6	2.93	.17		
<b>Induction</b>	Graduated	3	14	7.50	.57	2.875	.061
	Internship	3	14	6.29	.44		
	Fourth year	3	11	6.18	.27		
<b>Deduction</b>	Graduated	2	10	4.73	.37	.264	.769
	Internship	2	10	4.46	.34		
	Fourth year	1	8	4.75	.22		

Table (4.8): Descriptive statistics for nursing participants displaying CCTST scale by Educational Level.

#### **4.1.5.2. Results of CCTST Domains (Overall, Analysis, Inference, Evaluation, Induction, and Deduction) Scores per Age.**

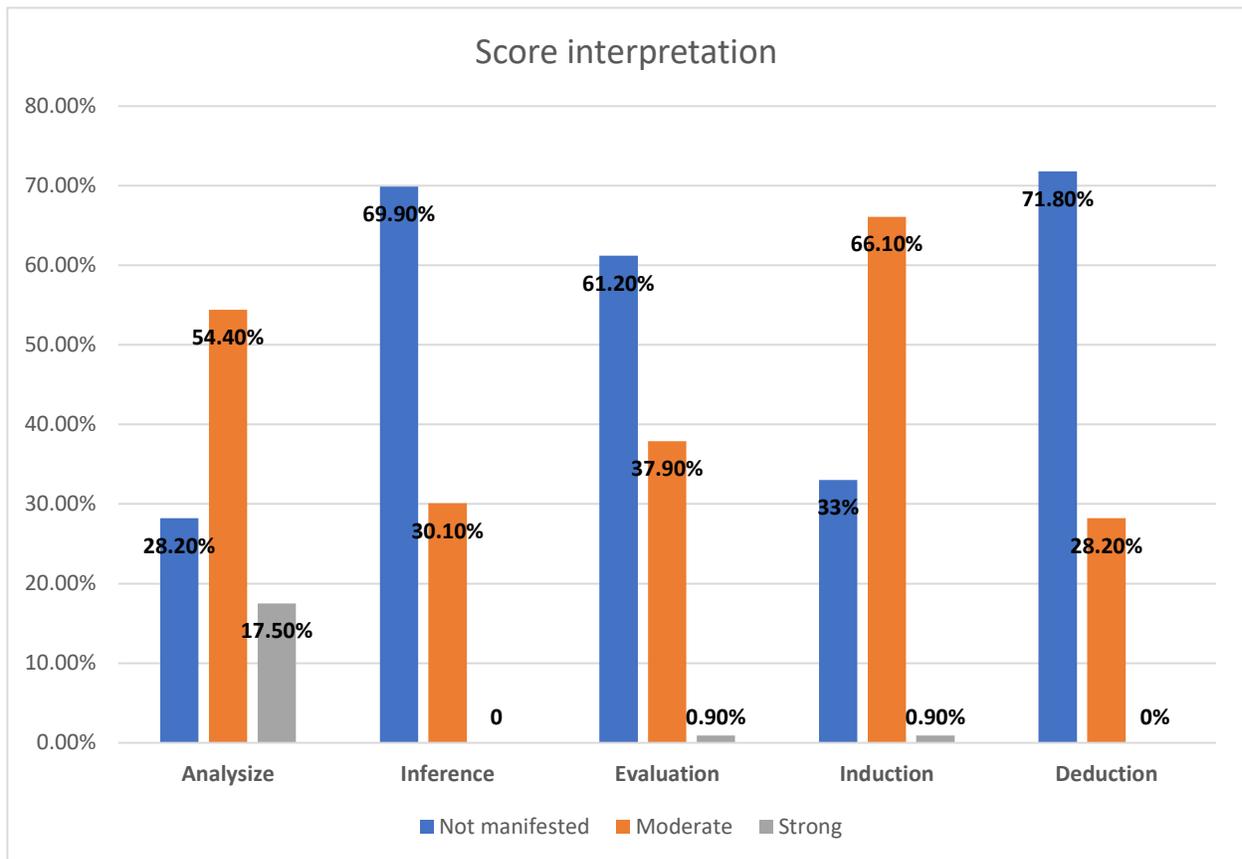
Table 4.9 demonstrates the range in critical thinking total scores and the CT domain scores per different age group. The results showed that there were no statistically significant differences in the CCTST results between the different age groups (18 - <26), (26 - <34), and (34- 42) showed a p-value less than 0.05. The results demonstrated that critical thinking skills were not aligned with the age of the participants. However, the pattern of mean and max of the CCTST overall and the five domains scores appeared to increase in the age group (26- <34) in overall, inference, evaluation, induction, and deduction scores except for analysis.

The table reveals that the overall mean score of the age group (18 - <26) was  $11.02 \pm 2.99$ . In addition, the mean score for analysis was  $3.31 \pm 1.35$  and  $4.76 \pm 1.8$  for inference. The mean scores for evaluation, induction, and deduction were  $2.94 \pm 1.39$ ,  $6.20 \pm 2.2$ , and  $4.81 \pm 1.65$ , respectively. The table reports that the overall mean score of age group (26 - <34) subjects was  $11.05 \pm 3.09$ , and the maximum score for analysis was 5, with a mean score of  $3.31 \pm 1.35$ . The mean score for inference was  $5.15 \pm 2.2$ . Meanwhile, the evaluation mean score for the same age group was  $3.30 \pm 1.8$ . However, the mean scores for induction and deduction were  $7.15 \pm 2.41$  and  $4.25 \pm 2.09$ , respectively. The table also demonstrates that the overall mean scores of the age group (34- 42) were  $10.8 \pm 2.13$ , and the minimum score for analysis was 2, with a mean score of  $3.5 \pm 1.04$ . The mean scores of inference evaluation, induction, and deduction, were  $4.66 \pm 0.81$ ,  $2.66 \pm 1.7$ ,  $6.50 \pm 1.97$ ,  $4.33 \pm 1.63$ , respectively. In conclusion, this table explains that there was no difference between mean scores of CCTST scale between the three age groups of the participants detected with p-value more than 0.05. Since P-value is less than 0.05, there is no significant correlation between all the participants' age groups and their overall means score of CCTST and the other domains scores.

<b>Variable</b>	<b>Group (N=103)</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>	<b>F</b>	<b>P. value</b>
<b>Overall</b>	18- <26	4	18	11.02	2.99	1.744	.099
	26- <34	7	24	11.05	3.09		
	34- 42	7	13	10.8	2.13		
<b>Analysis</b>	18- <26	0	7	3.31	1.35	.864	.436
	26- <34	1	5	3.05	1.19		
	34- 42	2	6	3.5	1.04		
<b>Inference</b>	18- <26	1	10	4.76	1.80	1.611	.108
	26- <34	1	11	5.15	2.2		
	34- 42	2	6	4.66	.81		
<b>Evaluation</b>	18- <26	0	7	2.94	1.39	1.305	.192
	26- <34	1	9	3.30	1.8		
	34- 42	0	4	2.66	1.7		
<b>Induction</b>	18- <26	2	11	6.20	2.2	2.997	.070
	26- <34	4	14	7.15	2.41		
	34- 42	3	8	6.50	1.97		
<b>Deduction</b>	18- <26	1	8	4.81	1.65	.643	.518
	26- <34	1	10	4.25	2.09		
	34- 42	2	6	4.33	1.63		

Table (4.9): Descriptive statistics for nurse participants regarding CCTST scale by Age group.

Figure 19 percentage distribution of studied participants regarding total score interpretation: Shows that 54.4 % of participants had a Moderate score interpretation related to the analysis domain. 69.9 % of them were Not -manifested in the inference domain and 61.20 % of them were Not- manifested related to the evaluation domain. Moreover, it demonstrates that 66.1 % of participants had Moderate scores related to the induction domain, and 71.8% of them were Not-manifested in the deduction domain.



**Figure 19** Percentage distribution of studied participants regarding total score interpretation (N=103).

#### **4.1.5.3. The Correlation between studied variables of the CCTST scale.**

The relationship between the overall score of the CCTST and its domains was investigated using a Pearson correlation coefficient (Pearson R test). Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a strong positive correlation between the overall score and the five domains (analysis, inference, evaluation, induction, and deduction) on statistical significant level  $r = .55, .80, .55, .84, .69, n = 103, p < 0.001$ , respectively as indicated in table (4.8).

The mixed method approach usually helps in providing better description of the relationship between variables through the rich data collected and triangulation (Creswell 2014). Many studies in the educational field adopted quantitative approach and explored the correlations between variables to explain the relationships. The current study added a qualitative approach to provide an in-depth explanation of the findings to explain their deviation or conjunction with the other study findings. The perceptions and beliefs of the participants' differ through contexts and they might have been the purpose behind the dissimilarity, so the usage of qualitative approach was important. The researcher conducted further analysis to determine if positive correlations existed among the variables (analysis, inference, evaluation, induction, and deduction). Inter-correlations between variables were used to measure how strong a relationship that were between the CCTST variables to investigate the influence of the nursing curriculum and the clinical experience on the participant's critical thinking and their ability to analyze and evaluate the actual real life scenarios through induction and deduction and inference critical thinking skills . The more the participants used to apply their critical thinking skills and trained to utilize the critical thinking skills in the class preparation and at their clinical experience, more correlation could be seen between the CCTST overall domain and other domains. Accordingly, the findings of the correlation relationship helped in answering the first research question. As shown in table 4.10 below, there was a highly positive correlation between overall domain and analysis, inference, evaluation, induction, and deduction variable at  $p\text{-value} < 0.01$ . In addition, there were highly positive correlation between analysis and induction, deduction, while there was no correlation with the evaluation domain at  $p\text{-value} > 0.05$ . Meanwhile, there was a highly positive correlation between inference and induction, deduction at  $p\text{-value} < 0.01$ . In addition, there was no correlation between

evaluation deduction and inference domains at  $p$ -value  $>0.05$ . Also, there was a high correlation between induction and all domains at  $p$ -value  $<0.01$ , except for no correlation with the deduction domain. Moreover, there was a highly significant correlation between deduction and overall, analysis, and inference domains at  $p$ -value  $<0.01$ .

Different authors have suggested different interpretation for correlation. However, Cohen (1988 p.79-81) suggested the following cut-off point guidelines:

- Small effect:  $r = 0.10$ -  $0.29$ .
- Medium effect:  $r = 0.30$ -  $0.49$ .
- Large effect:  $r = 0.50$  -  $1$ .

As shown in table (4.10), the relationship between the overall score of the CCTST and its domains was investigated using a Pearson correlation coefficient (Pearson R test). Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a strong positive correlation between the overall score and all the five domains sub scores (analysis, inference, evaluation, induction, and deduction)  $r = .55, .80, .55, .84, .69, n = 103, p < 0.001$ , respectively.

In addition, the correlations among the domains (analysis, inference, evaluation, induction, and deduction) were examined. The first domain analysis, indicated a medium significant positive correlation, at  $p$ -value  $<0.001$ , with induction and deduction  $r = .45, .40, n = 103, p <0.001$ , respectively. Furthermore, the correlation at  $p$ -value  $>0.05$  there was a low significant positive correlation with the inference sub scores  $r = .23, n = 103, p >0.05$ . There was no correlation with the evaluation domain at  $p$ -value  $>0.05$ . For the second domain (inference) at  $p$ -value  $<0.001$  there was a high significant positive correlation with inference, induction and deduction  $r = .59, .66, n = 103, p <0.001$ , respectively. While at  $p$ -value  $>0.05$  there was a low positive correlation with the analysis  $r = .23, n = 103, p >0.05$ . In addition, for the third domain (evaluation) at  $p$ -value  $<0.001$  there was a high positive correlation between evaluation and induction  $r = .59, n = 103, p <0.001$ . Moreover, the correlation at  $p$ -value  $>0.05$  there was a high positive correlation with the deduction sub scores  $r = .21, n = 103, p >0.05$  and there was no correlation with the inference and analysis sub scores at  $p$ -value  $>0.05$ , respectively. Moreover, for the fourth sub score (inductive) at  $p$ -value

<0.001 there was a high positive correlation with inductive, inference and evaluation  $r = .59, .59, .59$ ,  $n = 103$ ,  $p < 0.001$  respectively, and medium positive correlation between inductive and analysis  $r = .45$ ,  $n = 103$ ,  $p < 0.001$ . Adding to that, there was no correlation with the deductive domain at  $p$ -value  $> 0.05$ . Nonetheless, the correlation of the last domain (deductive) at  $p$ -value  $< 0.001$  there was a high positive correlation between deductive and inference  $r = .66$ ,  $n = 103$ ,  $p < 0.001$  and a medium positive correlation with analysis  $r = .40$ ,  $n = 103$ ,  $p < 0.001$ . Finally, there was no correlation with the evaluation and inductive sub scores at  $p$ -value  $> 0.05$ .

		OVERALL	analysis	inference	evaluation	induction	deduction
OVERALL	Pearson Correlation	1	.558**	.808**	.559**	.840**	.691**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
analysis	Pearson Correlation	.558**	1	.235*	-.075	.451**	.409**
	Sig. (2-tailed)	.000		.039	.516	.000	.000
inference	Pearson Correlation	.808**	.235*	1	.209	.595**	.669**
	Sig. (2-tailed)	.000	.039		.068	.000	.000
evaluation	Pearson Correlation	.559**	-.075	.209	1	.595**	.219
	Sig. (2-tailed)	.000	.516	.068		.000	.056
induction	Pearson Correlation	.840**	.451**	.595**	.595**	1	.188
	Sig. (2-tailed)	.000	.000	.000	.000		.102
deduction	Pearson Correlation	.691**	.409**	.669**	.219	.188	1
	Sig. (2-tailed)	.000	.000	.000	.056	.102	

Table (4.10): Correlation between studied variables of CCTST scale.

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

#### 4.1.6 Summary of the Quantitative Results

This section presents the quantitative results to answer this study's first research question.

1. The descriptive data obtained from the CCTST questionnaire addresses the extent to what impact does the nursing education curriculum have on three different nursing cohorts (undergraduate students, internship, and graduate) in terms of critical thinking, moral reasoning, and cultural sensitivity in the UAE?. A convenient sample of 103 participants from a health sciences education institution in Abu Dhabi that teaches the bachelors nursing degree (BSc) in four years for the undergraduate curriculum was chosen. Demographics of the study include three variables: the cohort, age, and marital status. The highest number of participants with 55.3% were in the fourth year, while the minority were graduates. In addition, the mean ages of the participants were comparable, the majority within the three age groups fell between 18 and 26 years of age (74.8%) with a mean of 24.02 years and a standard deviation (S.D) of 4.63 years, while the minority fell into the age group between 34 and 42 (5.8%). Most of the participants started their nursing education right after they graduated from high school, and 69% were single, while 31% were married.
2. Cronbach's Alpha reliability test for the CCTST domains was presented. The results showed that the instrument was reliable.
3. The majority of the (N= 103) participants who finished their tests within the accepted ranged period of 15 - 45 minutes were the fourth-year students with an average of 55.56%. However, among the participants from the 18 - < 26 group, the majority were able to adjust their time to answer the CCTST (76.67%).
4. The majority of the participants have a 'Weak' percentile as this result is predictive of difficulties with educational and employment related demands for reflective problem-solving and reflective decision-making. Followed with some cases of 'Moderate' percentile that indicates the potential for skills-related challenges when involved in reflective problem-solving and reflective decision-making associated with learning or employee development. Adding to that, only one participant was 'Superior' in comparing their scores for CCTST overall with the national comparison percentiles in the same profession. This result indicates that only one participant had critical thinking skill that is

superior to the vast majority of test takers. Skills at the superior level are consistent with high potential for more advanced learning and leadership.

5. The CCTST domains (overall, analysis, inference, evaluation, induction, and deduction) scores analysis shows that 54.4 % of participants had a Moderate score interpretation related to the analysis domain. 69.9 % of them were Not Manifested in the inference domain and 61.20 % of them were Not Manifested related to the evaluation domain. Moreover, it demonstrates that 66.1 % of studied subjects had Moderate scores related to the induction domain, and 71.8% of them were Not Manifested in the deduction domain.
6. The inferential statistics were utilized to generate the statistical significance of the differences between the means of the scores. It found there was a highly significant positive correlation between overall domain and analysis, inference, evaluation, induction, and deduction variable at  $p\text{-value} < 0.01$ . Also, the results showed a positive correlation between analysis, induction and deduction, while there was no correlation with the evaluation domain at  $p\text{-value} > 0.05$ . Adding to that, the results revealed that there was a high positive correlation between inference, induction and deduction at  $p\text{-value} < 0.01$ .

Furthermore, the results revealed that there was no correlation between evaluation, deduction and inference domain at  $p\text{-value} > 0.05$ . In addition, there was a high correlation between induction and all domains at  $p\text{-value} < 0.01$ , except for no association with the deduction domain. Moreover, there was a significant correlation between deduction, overall, analysis and inference domains at  $p\text{-value} < 0.01$ .

## **4.2 Qualitative Data Analysis Results**

Following the analysis of the CCTST questionnaire responses, the researcher analyzed the focus group interview responses of the participating Emirati and expatriate female nursing students and graduates. The focus group interview aimed to answer this study's second research question to explore the participants' perceptions of their nursing education curriculum and their clinical preparation with their impact on their critical thinking, moral reasoning and cultural sensitivity skills.

Trustworthiness is an essential step to avoid any problem that might arise from the focus group interviews. Therefore, the researcher trained herself in facilitating and regulating the interview techniques after she generated the used interview detailed questions following referral to relevant studies. Scholars have highlighted the concept of reliability and the possibility of unconscious bias to the collected data that the researcher may display because of his previous knowledge and preferences to the data (Richards 2014). Thus, documenting these biases would be valued while building the data. The researcher consulted her colleagues at the nursing college in Al Ain campus from different specialties to judge the interview questions. Two nursing lecturers and another two senior- nursing lecturers with long experience in the field of nursing education were referred to, to assure the content validity of the generated questions. Nonetheless, to avoid any unexpected deficiencies, the researcher piloted the question through conducting a pilot study with five nursing students selected by the researcher from different cohorts as a convenient sample that were excluded from the assigned sample.

#### **4.2.1 Participants' general opinion about critical thinking, moral reasoning and cultural sensitivity (online questions).**

The researcher requested the Insight Assessment team to add three online background statements to respond to before the participants started the CCTST questionnaire that could support answering the study. Those statements were ice breaking and warm-up to encourage the participants to talk and elaborate more during the interview based on the interview protocol. They were not part of the CCTST 34 questions, and the participants' responses were used in the qualitative discussion and results only. The three online questions concerned the participants' general opinion about nurses' critical thinking and moral reasoning skills preparation to overcome the cultural differences within the UAE context within the educational and clinical settings. The participants had clear instructions to start answering these statements before they began their actual CCTST (34) multiple-choice questions by replying, "Agree or disagree." The participants' time that was consumed to answer these statements was excluded from the 45 minutes that was

designated to answer the actual CCTST questionnaire. The three background online statements were:

1. Patients' opinion towards their nurse's daily clinical decisions is essential within the UAE hospitals?
2. The nurses' role is vital in handling the patients' everyday cultural and moral dilemmas.
3. The current nursing education curriculum needs to be reformed to effectively teach moral and cultural clinical decisions to overcome the cultural differences within the UAE.

**Table (4.12):** This demonstrates the participants' opinions about critical thinking (N=103) concerning their reply to the three questions. It reveals that most of the studied participants (97.1%) agreed the patients' opinion towards their nurse's daily nursing clinical decisions is vital within the UAE hospitals. Moreover, the majority of the participants (98.1%) agreed that nurses' role in handling patients' culture and moral dilemmas, as well as nursing education, needs to overcome the cultural differences in the UAE with the same percentage. However, most of the studied participants (97.1%) agree with the importance of patients' opinions toward the nurses' clinical decisions. Also, (98.1%) of participants agree with the importance of nurses' role in handling patients' culture, and that nursing education needs to be reformed to prepare the nurses for those skills.

Items	Agree		Disagree	
	N	%	N	%
Patients' opinion towards their nurse's daily clinical decisions is essential within the UAE hospitals.	100	97.1	3	2.9
The nurses' role is vital in handling the patients' everyday cultural and moral dilemmas.	101	98.1	2	1.9
The current nursing education curriculum needs to be reformed to effectively teach moral and cultural clinical decisions to overcome the cultural differences within the UAE.	101	98.1	2	1.9

Table (4.12): Summary of the number and percentage distribution of studied participants regarding their opinion about critical thinking (N=103).

#### 4.2.2 Qualitative Data Thematic Analysis:

The focus group interview with the participants from the three cohorts aimed to answer this study's second research question:

What influence, if any, does the workplace preparation have on the three different nursing cohorts' practices concerning critical thinking, moral reasoning, and cultural sensitivity in the UAE?

The participants' responses were assembled and coded, then analyzed into commonly shared themes that grouped and matched the same or closed perspectives. Based on the participants' responses to each of the study main elements of critical thinking, moral reasoning, and cultural sensitivity, the following categories and codes emerged: Four themes were gained from the participants' replies; curriculum and workplace preparation, UAE multicultural environment, clinical decision-making, and the association between critical thinking, moral reasoning, and cultural sensitivity. These are discussed below.

#### 4.2. 2.1 Curriculum and workplace preparation

The participants' responses to the open-ended question on how they were introduced to critical thinking, cultural sensitivity, and moral reasoning in nursing were considered. Most of the participants responded that they were enrolled in courses designated for preparing them for practicing excellent critical thinking skills as advanced clinical decision-making and leadership courses. One of the nursing students from the fourth year initiated the conversation and said that *“The college is providing us now with some courses that taught us critical thinking, moral reasoning, and cultural sensitivity to take the best decisions during our clinical care with our patients through the theory classes, labs and clinical ”*. Three participants agreed with what was highlighted by their colleagues and they pointed to their current nursing courses. They mentioned that their nursing curriculum had designated specific courses to introduce them to practice critical thinking, cultural sensitivity and moral reasoning and added that: *“The College gave us some designated courses at our nursing curriculum study plan and work on preparing us through the theoretical classes with deep case discussion from real cases. The case-based courses were advanced clinical practice, leadership, law, and ethics, and cultural nursing”*. *“Our college taught us critical thinking while studying some courses such as advanced clinical practice and Leadership courses as most of the time spent on discussion and reflection.”* *“We are prepared to be competent in thinking critically, our college work as much as possible and trying to improve our theoretical knowledge in our courses as advanced clinical practice, leadership, law and ethics as well as cultural nursing courses to be ready for practicing problem-solving techniques as per the hospital policies.”* They added that, cultural sensitivity, and moral reasoning were covered in more detail within the cultural course that was covering the UAE culture. In addition, the class discussion was covering a deep discussing about other cultures precisely: *“The cultural sensitivity and the moral reasoning have been covered within the cultural course in more depth, and we discussed these terms within our culture, and we were trained on how to deal with different cultures.”*

Other students from year four mentioned that the cultural nursing course prepared the students to be culturally competent by teaching them how to be culturally sensitive and understand others'

perspectives. They added that cultural sensitivity was discussed in one designated course, debating the UAE culture in depth and discussing the other cultures. *“The cultural sensitivity and the moral reasoning have been covered within the cultural course as we had an intensive discussion about the cultural perspectives and the UAE culture in more depth to understand our patient’s needs.”* *“The cultural course discussed the UAE culture in-depth as well as we had a great discussion and knowledge about multicultural beliefs and traditions and how to understand their perspectives, religion, beliefs, and values and how to accept and respect everyone.”*

Meanwhile, others felt that cultural sensitivity and moral reasoning were a part of the entire nursing curriculum including the theoretical and clinical courses. One stated that: *“Our college curriculum was leading and teaching us to be culturally sensitive with good morality in all the theoretical and clinical courses that we took, and to be good critical thinkers at the theory and clinical practice, we had discussed that within every course that we took at the college.”* One participant described the same stated idea on moral reasoning as it was covered within the law and ethics course with more practice from real-life cases and actual scenarios (case-based learning). *“Moral reasoning has been covered within the law and ethics course with more discussion of real examples from our life during the case discussion in more depth in the class and clinical reflection time and at some simulation labs.”* The minority of the students replied that their college theoretical courses were not enough to prepare them for being good critical thinkers. They also felt that they did not have the confidence to make any moral decisions for their patients, although they understand their cultures. Some participants from the working cohorts (graduates) highlighted some limitations: *“Not enough efforts are given to prepare us to be good critical thinkers or have good moral reasoning skills as we lack the confidence to have good decisions for our patients.”* *Others said: “it has many time limitations to have a good discussion for the real-life cases during the theory classes as the class time was very short for covering all the discussion.”* However, some said, *“We did not like it as the teachers did not give us the right to share our opinions freely, and did not hear to us discussing new information because whenever we do that some teachers try to prove us wrong and the patient and their families rejected us with the short time at the clinical settings.”*

However, some participants have highlighted the importance of developing and improving the nursing curriculum and working on updating it through research and professional development of the lecturers. Others elaborated on peer influence and peer teaching, which is essential in enlightening and humanizing the students' critical thinking, moral reasoning and cultural sensitivity skills. *“As a nursing student, I need to study those courses in more depth to be competent and deal with my patients the way they like and using their values to prevent any mistake in our clinical decisions.” “They should involve classes where students share their experiences to learn from each other’s experiences.” “Focus more on the quality of teaching.” “Increase the budget for nursing research.” “The teacher who is teaching the course is more important than the curriculum to increase our critical thinking abilities and be positive morally and culturally.” “The curriculum cannot influence us if the teachers are not changed. Although there were, many teachers were affecting us deeply positive. “Having a long time spent in the clinical settings will help us to see more cases,”*

The main theme that emerged was curriculum and workplace preparation with two sub-themes: advantages and limitations. The participants agreed that they were prepared to be critical thinkers and culturally sensitive through the college courses at different settings and planned curriculum courses. They insisted on the role of their college and clinical practices in encouraging them to understand their patients' needs and make the best decision through deep critical thinking skills. However, they described that they faced other limitations with the class time, rejections of the patients and their families and limited exposure to real cases at the clinical settings. The codes that emerged from the advantages were theory classes, clinical training, simulation labs, case-based practice, reflective discussion and problem solving. The codes that were developed from the challenges and limitations were clinical placements, exposure to real cases, time, workplace policies, patients and family rejection.

#### 4.2.2.2 UAE multicultural environment

The participants gave responses to the open-ended question on how aware they are that the complexity of nursing education and clinical settings in the UAE may affect their nursing care and clinical decisions. The researcher aimed to explore the participants' perspectives of the cultural educational and clinical environment during their clinical training at the hospitals. In addition, she was looking to explore the graduates' views on the UAE's multicultural work environment after working at different healthcare settings in the UAE as part of this community. The participants acknowledged that this is the stark reality of the UAE healthcare and education setting and it is normal to deal with patients and workers from different cultures: *“We used to face different cultures in our clinical settings as healthcare professionals and patients come from different cultures speaking differently.”* *“I think that we have enough knowledge about the UAE culture, and we understand other cultures as well. “It is a positive ability and skill for us because we already know many cultures, and we used to deal with many people with different cultures and perspectives.”* *“We used to be in a multicultural environment and being a part of it from our childhood.”*

One of the non-local students expressed her willingness to have a better understanding of different cultures. She felt she had insufficient knowledge about the non-local patients needed, with limited background knowledge of their values and beliefs as she was used to dealing with local patients mainly. The other non-local students were encouraged to discuss the same need, as they have limited knowledge about different cultures rather than the UAE culture, they elaborated and said *“It is good to have an adequate understanding of the complexity of both the UAE clinical settings and nursing education institutions at the college.”* *“It is important to know about UAE culture.”* *“Studying other cultures are important too.”* *“In general, we are exposed to deal with many cultures as a normal relationship! But as a nursing student, we need to take those courses further to better understand the cultural complexity in the workplace in the future”.*

Unpredictably, one of the participants linked the critical thinking abilities to cultural awareness, and she pointed to the positive correlation between both. Another student related cultural awareness to correct clinical decision-making and nursing competency in general: *“It is positive to critically think and understand our patient’s cultures. “As nursing students, we need to study other cultures in more depth to be competent nurses and deal with our patients with their values to prevent mistakes with our clinical decisions. “Moreover, many participants did not agree that the educational courses and cultural understanding should be limited to understanding the UAE culture in specific. They need other cultures to be part of the educational courses, and they want to recognize most of the different cultures in more depth. “We think that we need more information about other cultures to know how to deal with the patients as a health care provider for many nationalities from different cultures. “We need to know and study other cultures to avoid any kind of disrespect to others accidentally. ”We need to know about the other cultures that could make us able to deal with any patients from any culture in the best way we can and respect them.” “It is very important to know more about other cultures languages and believes to improve our cultural knowledge.”As health providers, we need to know the culture of the others and study them in-depth”.*

Others came up with different opinions, as they need the other healthcare professionals to learn about the UAE culture to understand how to deal with Arabic Muslim patients and avoid misunderstanding their spiritual, cultural and religious needs. They also feel that a good understanding of the Arabic Muslim values and beliefs by non-Muslim healthcare providers will help their local patients and reflect the overall more fully. *“The UAE national, Arabic, and local students are familiar with the UAE culture. While the other nurses from other cultures are not. To avoid discrimination and show more empathy and avoid disrespect to others, we think the nurses from other cultures should learn about the UAE culture and how to deal with the Arab Muslim patients ”“Cultural courses should be provided to all the people that live in the UAE.”*

*“Health professionals are expected to put their patients’ interests above their own culture and limit their perspectives. ”In the UAE, there is a cultural sensitivity issue between males and females who is eligible to make a decision; awareness is needed within the culture.” “Nurses tend not to use critical decision making as they prefer not to use it, and they waited for the doctor's permission.”*

The main theme that emerged was UAE multicultural enlightenment with two sub-themes: advantages and limitations. The participants agreed that they were prepared to be culturally sensitive through the college courses in different clinical settings and the planned curriculum courses. They insisted on the role of their college and clinical practices in encouraging them to understand their patients' needs and make the best decisions by building up their skills to be culturally competent nurses. However, they described that they faced other limitations with understanding different cultures at the same level as the UAE culture. In addition, they focused on the importance of other healthcare professionals in understanding the UAE culture and understanding their patients' needs. Finally, they highlighted the importance of raising cultural awareness to the role of the women and defending their abilities to make decisions. The codes that emerged from the advantages were awareness, respect, acceptance, humanity, sensitivity and knowledge. The codes that were obtained from the limitations were complexity, multi-perspectives, multi-expectations, social image, gender and language.

#### **4.2.2.3. Clinical decision-making**

The participants' responses to the open-ended question on how they were first introduced to the CT, MR, and CS were remarkable. Most of the students and the graduates agreed that cultural sensitivity and moral reasoning were added to them at their high schools before attending the nursing college and before studying the nursing courses. They argued that they were building up their knowledge about the cultural and moral values and the importance of accepting others since long before entering college. Critical thinking was first introduced to them at the college from their first exposure to the nursing courses after passing the general requirement courses. They agreed that they lacked background knowledge about critical thinking before joining the nursing program, as they were not exposed to it before. Others mentioned that the first time they encountered critical thinking and preparations was in the nursing college, and they listed some designated courses from different nursing curriculum levels: *“The first time we learned about the moral reasoning and cultures it was in school and from day one in the nursing college. “was*

*introduced to cultural sensitivity and morality with empathy and sympathy terms in our sociology class at grade 11 in school". "We learned that cultural sensitivity was the role number 1 at the clinical from the first clinical course". "We learned critical thinking from our nursing practices at the hospital while dealing with many situations at the hospitals". "Our teachers at the college prepared us with the critical thinking knowledge and how to think fast in different situations". "We have gained knowledge about the CT, MR, and CS in BN2 (year 2) in nursing and from the first day when I attended the class." "It was the BN2 in the college in clinical health assessment course we discussed the issue of privacy and culture sensitivity and autonomy where the patient has the right to refuse when we examine the patients and during our first clinical day of that course, as well as the anatomy and psychosocial courses in that year". "When we had our first class in nursing, it was talking about how to respect the patients" and "what the patient said is always correct" this expression helped us to know how to deal with our patients and be able to build a trusting relationship with them."*

Surprisingly, some students clearly correlated their critical thinking abilities and understood their patient's moral reasoning and cultural sensitivity to provide the patients with holistic care "the best care" through the correct clinical decision-making. They requested further preparation of critical thinking skills to have safe and competent clinical decision-making skills. The participants spontaneously mentioned the correlation between the three terms as they feel that having these skills will lead them to the proper decisions in their clinical judgments. The participants understood all the required skills to provide their patients with the holistic nursing care as seen in these examples: *"We need deep cultural courses to understand more about other cultures to think critically to choose the best care for our patients during moral dilemmas." "If we understand our patients from the other cultures with our good understanding of our patient's needs, we could improve our nursing care to be the best by developing our morally and culturally sensitive skills."*

*"All the patients are entitled to autonomy and making their own choices based on their personal, religious, spiritual or cultural convictions" and "all other needs that are non-medical needs of a patient should be respected for having holistic care as cultural, spiritual, psychological and social." "If we understand the patients from other cultures, and we understand our local patient's needs, we could provide the best nursing care with mature, morally, and culturally sensitive skills."*

*"All the patients are entitled to autonomy and making their own choices based on their personal, religious, spiritual or cultural convictions" and "all other needs that are non-medical needs" patients should be respected for having holistic care as cultural, spiritual, psychological and social care".*

Suddenly, some students mentioned that critical thinking and moral reasoning (morality) skills have been introduced to them at the early stages of their childhood from their family members at home, before they were formally exposed to it at the college. Then, the advanced college courses prepared them to know how to think and then analyze each situation differently. The college preparation empowers them to have good practices in developing safe and correct decisions for their patients until they gain their own experiences from their actual clinical skills. *"I learned about morality and culture sensitivity concerning others besides thinking well before I act at home, it increased more at school, and it improved in the college."* *"At home, I learned how to be culturally sensitive and think to choose the best for all. At high school, my knowledge increased to a positive way of thinking morally then at the college developed to use it more at workplaces to produce safe decisions".* *"Critical thinking and moral reasoning were introduced to us in school, we learned to "think outside the box" we learned the concept of thinking deeply and critically from our schools and we started to know the cultural sensitivity in grade 11".*

The participants shared their academic concerns, clinical limitations, and disappointing features of nursing during practicing moral reasoning and cultural sensitivity whenever they talked about different clinical decisions that concern their patients' health. Most participants agreed that it is too hard to judge people from various aspects, and it is hard to satisfy all. Furthermore, nursing societal support and the community image of nursing are other limitations to practicing decision-making freely and professionally in the UAE. *"Nursing is a perfect way to reflect humanity in us, but some nurses are not taking it as a lovable career, but they just look at the income."* *"It is really hard to guess people's mortality and to act upon it."* *"It is not easy."* *"Be fair in your work."* *"Fair from rejection from others."* *"They prefer doctors to decide for them in our community."* *"Nurses tend not to use critical decision making; they always need doctor's permissions."* *"Having a long time spent in the clinical settings, long shifts, workload, some of the patients does not respect the nurses due to other social images" "being not secured at your work"*

The main theme that emerged from the above was clinical decision making with two sub-themes: advantages and limitations. The participants agreed that they were prepared to be competent critical thinkers with good cultural sensitivity and moral skills. The college courses and the different clinical settings have helped them be critical thinkers. However, they felt that they had a good preparation to be culturally sensitive with good morality skills at early stages before college. They all had a good understanding of the impact of cultural sensitivity and moral reasoning in preparing them to be good decision-makers to meet their patient's needs and provide holistic care. However, they emphasized the role of the college in empowering and developing them to be good critical thinkers for every clinical situation. The codes that emerged from the advantages were autonomy, holistic patients care, problem- solving preparation and CT, MR, CS. However, the codes that were issued from the limitations were gender, social image, clinical exposure, home awareness, complexity at work and experience.

#### **4.2.2.4. The association between critical thinking, moral reasoning and cultural sensitivity**

Remarkably, participants made a clear and straightforward correlation between the three concepts of critical thinking, moral reasoning, and cultural sensitivity through their responses. They declared that these skills could prepare them to develop their nursing care skills and lead their clinical decisions to give their patients excellent care ultimately. It is worth mentioning that they were not directed to connect those concepts together. The correlation was made based on their own experiences and from their own perception and preparation. Moreover, they listed some specific courses that inspired and introduced a clear path to prepare them to develop their decision-making skills for providing high quality and safe nursing care. *“At the college, I learned by the time that the combination of moral reasoning, cultural sensitivity, and critical thinking is essential to make me a good nurse from day 1” from the nursing college courses such as law and ethics, advanced clinical decision making, leadership, evidence-based practices, and cultural nursing.”* *“We became familiar with different cultures from our high schools, and we had the basic understanding to the moral reasoning in our schools, while critical thinking I learn about it at the*

*college and we learned how to behave when facing different cultures and we learned how to create safe and appropriate decisions”. “The first time I learned about CT, MR was in my second clinical exposure when I faced a dilemma and my clinical instructor who guided me to face out this issue step by step to solve it” “We should mix and match situations because whenever you use one the other one come in need.” “Morality is a personal thing, and each one of us is so different from others; this is what we learned at the end.”*

Decision-making had a clear explanation from most of the participants as they emphasized discussing it as the dominant concept and created a correlation with the other concepts. The participants designated how their lecturers challenged them to choose the appropriate action for their patients and avoid what should not be done to the patients differently. They were trained in analyzing and merging the information to reach a conclusion and choosing the best action possible to solve the problem. The lecturers engaged them in many problem-solving tasks through different cases and provided unusual contexts or constraints for more practices and discussions. They illustrated that: *“CT is the ability to observe the situation gather details about it, and find other sources that could cause the situation. Then, analyzing and merging the information to reach a conclusion and choose the best action possible to solve the problem, respect difference even if you disagree with others, believes that ethical and moral respect could lead to any dilemma.” “Critical thinking is to be able to think deeply and make decisions with good results, and CS is to be respectful for any other cultures and MR you need to respect the other wishes.” “CT is a smart way to solve the complicated situation and result in max benefits for all, CS to know and respect different cultures despite the differences, MR to use our moral side beside our logical side to get the best results emotionally and technically.” “CT to think perfectly by using knowledge, skills, and experiences to make reasoned judgment logically and well thought with argument and conclusion. MR is a thinking process for determining whether an idea is right or wrong. CS is a set of skills that enable us to learn and understand people who are different from ourselves, thereby becoming better able to serve then within their own communities”.*

The participants were able to give a clear definition of critical thinking as a term, and they were able to direct their thinking to adopt clear steps to analyze each situation from a different

aspect. They were aiming to make their decisions based on the needs and perspectives of the other. The participants had a clear picture of the importance of accepting the differences among other societal and cultural groups, and they worked on having a stable and safe decision from all aspects. They insisted on the importance of having good knowledge, skills and experience to come up with the best conclusions during ethical and moral dilemmas. *"Nurses tend not to use critical decision making as they prefer not to use it, and they waited for the doctor's permission."* *"Every day new problem"* *"Nurses tend not to use critical decision making; they always need doctor's permissions."* *"The discussion in the class only benefited us on how to deal with the real situations, to think about what to do, and how our teachers were our heroes."* *"Increase the budget for nursing research and support them."* *"The teacher's experiences, stories, and examples helped us learn what to do at the patient's side and how to think, our teachers are our heroes."* *"But we need to practice"* *"The students do not have a college life only academic teaching should give a value to the research and develop a student's center."* *"More listening to the students, introduce changes to the college policies and roles, increase the teachers."* *"Understand the students' needs and opinions; focus on quality rather than quantity."*

Finally, the students' suggestions of how we can overcome the current limitations were to apply further changes and reforms for better preparation to enhance the nurses' critical thinking, moral reasoning and cultural sensitivity abilities within the nursing curriculum, and clinical settings in UAE. The majority of the students had agreed on one response that the teaching staff was the best to prepare their CT, MR, and CS skills. In addition, they have influenced them to develop their skills in the class, labs and clinical settings. Besides, most of the participants had a great benefit from the class discussions and shared with their teachers their own experiences during the reflective discussion meetings. In addition, they mentioned that the curriculum preparation is enough for the students to understand their college ethical and morally important concepts. Then, they developed their skills by more practices that were improved by time through their clinical practices at the workplace with more exposure to new cases. Others suggested that the nursing image is another limitation for them, and they need more support from the college policies and administration to listen to their needs. Many understood the importance of nursing research, and they suggested developing a research center at the college. Nevertheless, they requested that the

college administration should hire more staff to develop the college and have more time flexibility with their teachers during teaching and office hours. Finally, all participants agreed on focusing more on the quality of teaching outcomes rather than the quantity to empower the students with all the needed skills.

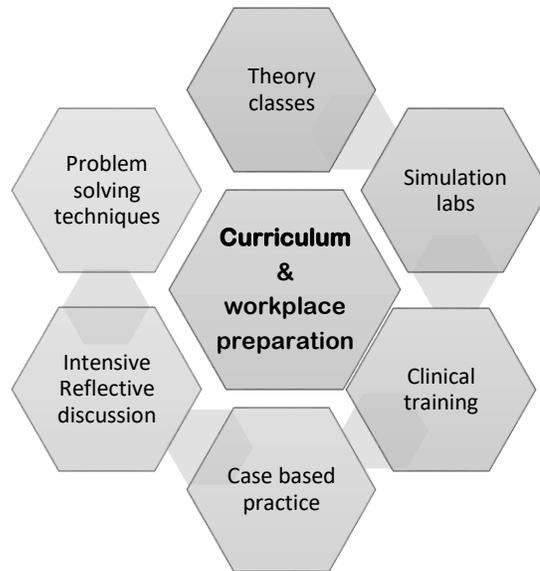
The main theme that emerged from the above input was the association between critical thinking, moral reasoning and cultural sensitivity with other sub-themes: problem-solving skills and autonomy. The participants agreed that they were competent in defining critical thinking and problem solving with good cultural sensitivity and good moral skills. In addition, they mentioned that they had good preparation and experience to be involved in analyzing the whole situation to make decisions with good results and respect others during complicated circumstances. The codes that were emerged from the advantages were respect of differences, leadership, clinical reflection, safe clinical practice, and clinical decision-making and holistic care. However, the codes that were developed from the limitations and challenges were time, complexity, different perspectives, moral dilemmas, support and resources.

### **4.2.3 Summary of the Qualitative Results**

The qualitative results presented a detailed explanation of the Emirati female nursing students and graduates of their general perceptions on critical thinking, moral reasoning and cultural sensitivity preparation at their nursing college and workplace in the UAE. The main aim was to reach a clear picture of the current training at the college and the clinical settings. Based on the leading elements critical thinking, moral reasoning and cultural sensitivity, four principal codes for the themes were gained from the participants' replies; Perceptions of curriculum and workplace preparation, UAE multicultural environment, clinical decision-making, and the association between critical thinking, moral reasoning and cultural sensitivity.

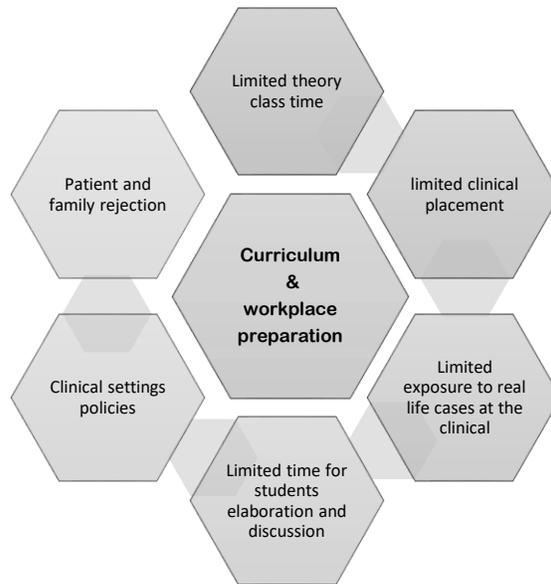
The following figures present a summary of the advantages and benefits that emerged from the participants' perceptions;

First, the Emirati and expatriate female nursing students and graduates general perceptions on critical thinking, moral reasoning and cultural sensitivity preparation at their nursing college and workplace showed that the curriculum and workplace preparation benefited from theory classes, simulation labs, clinical training, case- based practice, intensive reflective discussion and problem-solving techniques as illustrated in (figure 21) below:



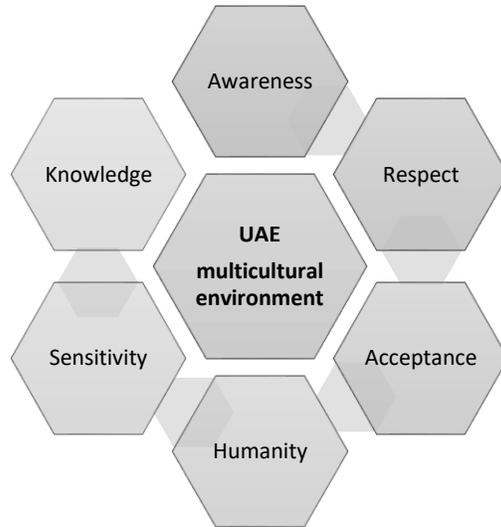
**Figure 14** Advantages and benefits of the nursing curriculum and the workplace preparation.

On the other hand, the participants' perceptions of critical thinking, moral reasoning, and cultural sensitivity preparation at their nursing college and workplace in the UAE highlighted that the curriculum and workplace preparation was limited from the short time scheduled for their theory classes. In addition, the limited clinical training placement, as they did not have the chance to visit many departments at their training hospitals, limited them in terms of dealing with real-life cases at the practice settings. Moreover, the reflective discussion was very short, and they found it hard to express their feelings at the end of the clinical day. The hospital policies were another big challenge that restricted their involvement with their patients to practice all the skills. Finally, the patients and their families who would not permit nursing students to practice on them rejected some nursing students. This was another significant limitation as illustrated in (figure 22) below:

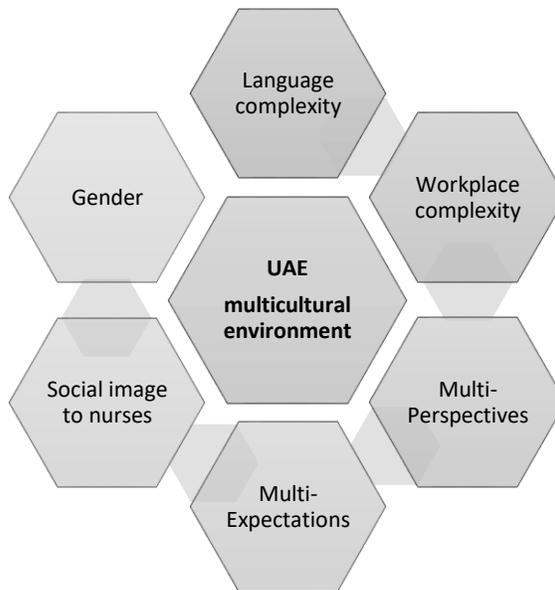


**Figure 15** Challenges and limitations of the nursing curriculum and the workplace preparation.

The UAE multicultural environment has influenced the nurses' and the graduates' critical thinking, moral reasoning and cultural sensitivity preparation at their nursing college and workplace positively by providing a good awareness of different cultures. They were trained in respecting the patients from all cultures as they understand how they differ. In addition, they have grown up with positive feelings towards humanity and cultural sensitivity by interacting with multicultural groups in their country. Finally, this multicultural context motivated the educational systems to increase the community's cultural knowledge through theoretical orientation and clinical preparation of many ethical norms and concepts for moral challenges and resolutions. On the other hand, the UAE multicultural environment had the following limitations on the participants: language and workplace complexity, multi-cultural perspectives, high expectations, social image to the nursing career and gender as shown in (figures 23) and (figure 24) below.



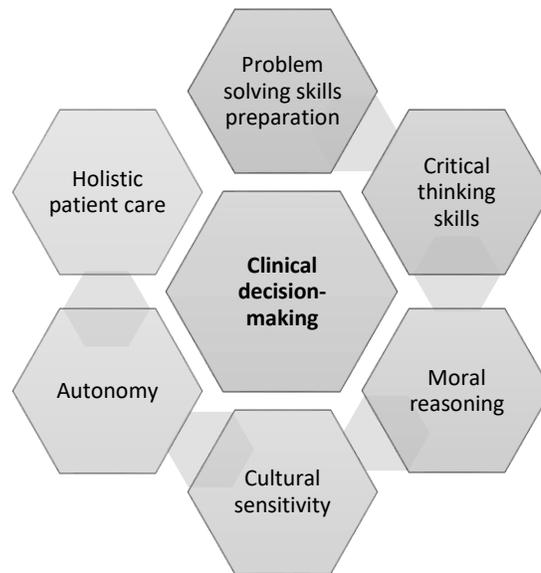
**Figure 16** Advantages and benefits of the UAE multicultural environment



**Figure 17** Challenges and limitations of the UAE multicultural environment.

This study shows the impact of the clinical training and clinical preparation on critical thinking skills to ensure safe and competent clinical decision-making nurses to develop their own clinical judgment skills from their actual clinical experiences. Clinical decision-making input developed the nurses' problem-solving skills, critical thinking, moral reasoning, cultural sensitivity,

autonomy and enabled them to provide holistic care to their patients. However, the limitations were gender rejection, a societal nursing image that limited their clinical exposure, limited clinical experiences at the designated departments with constant cases in the hospitals , and the cultural complexity at the hospital with limited awareness at home of their career, as shown in (figure 25) and (figure 26).

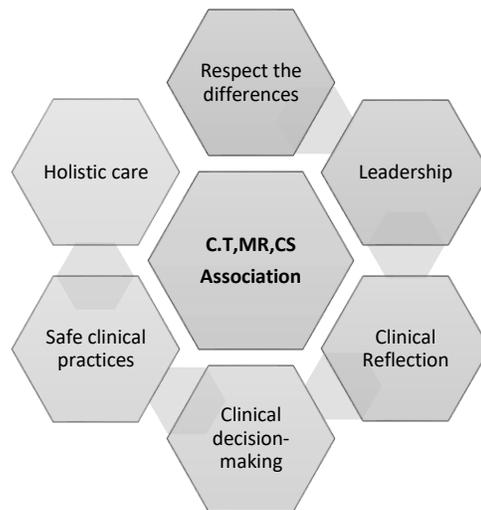


**Figure 18** Advantages and benefits of the clinical decision-making.

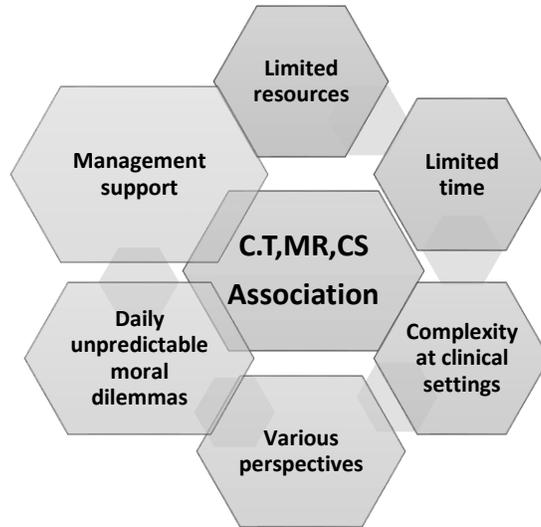


**Figure 19** Challenges and limitations of the clinical decision-making

Finally, the Emirati and expatriate female nursing students and graduates found that there is a strong association between critical thinking, moral reasoning, and cultural sensitivity preparation to develop their critical thinking and clinical judgments. This association facilitated them to have better leadership with clinical reflection and developed their clinical decision-making skills to provide their patients with safe practices and holistic care after understanding their needs based on respecting their differences. The limitations in this association were time, resources, management support, complexity at the clinical contexts with various perspectives, and the daily unpredictable moral dilemmas shown in (figure 27) and (figure 28) below.



**Figure 20** Advantages and benefits of C.T, MR, CS Association



**Figure 21** Challenges, limitations of, and benefits of C.T, MR, CS Association

Themes	Sub themes	Codes
Curriculum & workplace preparation	Advantages	Theory classes Simulation labs Clinical training Case based practice Intensive Reflective discussion Problem solving techniques
	Limitations	Limited theory class time limited clinical placement Limited exposure to real cases at the clinical Limited time for students' elaboration and discussion Clinical settings policies Patient and family rejection

UAE multicultural environment	Advantages	Awareness Respect Acceptance Humanity Sensitivity Knowledge
	Limitations	Language complexity Workplace complexity Multi- Perspectives Multi-Expectations Social image to nurses Gender
Clinical decision making	Advantages	Problem solving skills preparation Critical thinking skills Moral reasoning Cultural sensitivity Autonomy Holistic patient care
	Limitations	Home Awareness Gender Rejection Nurses social image Clinical exposure Experience Complexity at work place
C.T,MR,CS Association	Advantages	Respect the differences Leadership Clinical Reflection Clinical decision-making Safe clinical practices Holistic care

	Limitations	Limited resources Limited time Complexity at clinical settings Various perspectives Daily unpredictable moral dilemmas Management support
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Table 4.13. Summary of Themes

Triangulation through using the two research designs will show the strength of the mixed approach in the educational studies (Creswell 2014). It is essential and recommended by many researchers in teaching and learning studies or within any educational phenomenon for two main reasons - the complexity in the teaching and learning and the complexity within the educational cultural context (Creswell 2014; Teddlie & Tashakkori 2009). This study approach allowed the concurrent data collection for CT, MR and CS examination that attained the aim of the study and helped the researcher to answer the research questions successfully (Creswell 2012; Lopez 2014; Medina 2014; Ponce & Maldonado 2015). This method enabled a better examination to achieve the aim of the study and answered the research questions through simultaneous data collection within the UAE context. As a result, researchers claimed that triangulation of the study could help in validating each finding and strengthen the weaknesses of the other in qualitative, quantitative as well as mixed methods (Campbell & Fiske 1959; Fraenkel & Wallen 2009). A mixed approach combining both qualitative and quantitative techniques is considered to be the research approach that can minimize the limitations of each one if it used alone. The mixed approach helps the researcher to interpret the results and decrease threats to the validity of the research. Many studies in the educational field adopted quantitative approach and explored the correlations between variables to explain the relationships. The current study added a qualitative approach to provide an in-depth explanation of the findings to explain their deviation or conjunction with the other study findings. The perceptions and beliefs of the participants' differ through contexts and they might have been the purpose behind the dissimilarity, so the usage of qualitative approach was important.

## **Chapter 5:**

### **Discussion, Conclusion, Recommendations and Limitations**

Chapter five contains the discussion, conclusion, recommendations and limitations for future researches in the field. Chapter four presented the quantitative and qualitative data results. This chapter will provide further discussion with further elaboration to offer a combined interpretation for the two research questions referring to the results. Previous studies' findings are compared to the current research to support or disprove the new findings. In addition, this chapter presents an overall conclusion, and the researcher suggests recommendations for the healthcare stakeholders and the nursing education leaders. Finally, the researcher reports the study's limitations, and suggested future research applications for future research in the nursing field based on the study's findings.

#### **5.1 Discussion of the Findings:**

The purpose of the study was to investigate the critical thinking quality and clinical decision-making among the UAE nursing students and graduates within culturally competent care. Furthermore, the study aimed to explore the deep understanding behind the participants' preparation for critical thinking, moral reasoning, and cultural sensitivity in their curriculum and clinical training after being instructed and assessed authentically. A concurrent mixed-method approach was adopted to address the purpose and provide answers to the two research questions, which were:

1. What impact does the nursing education curriculum have on three different nursing cohorts (undergraduate students, internship, and graduate) in terms of critical thinking, moral reasoning in the UAE?
2. What influence, if any, does the workplace preparation have on the three different nursing cohorts' practices concerning critical thinking, moral reasoning, and cultural sensitivity in the UAE?

The mixed-method research approach adopted used data from questionnaires completed by 103 participants from three nursing cohorts and semi-structured interviews conducted with 15 female participants from three nursing cohorts (5 from year four, 5 from the internship, and 5 graduates). The main sections in this chapter are dedicated to a discussion of the research findings developed from the study about research questions one and two in relation to the relevant literature.

### **5.1.1 Discussion of the Results of Research Question 1 (Critical Thinking among the UAE Nurses):**

To answer research question one about the nursing education curriculum's impact on the preparation of three different nursing cohorts in terms of critical thinking, moral reasoning, and cultural sensitivity in the UAE, quantitative data were collected from the female (undergraduate students, internship, and graduate) using the California Critical Thinking Skills Test (CCTST) form B. The questionnaire presented their critical thinking Overall scores, and the sub score of the other domains: analysis, inference, evaluation, induction, and deduction.

The results obtained from the questionnaire data indicated that critical thinking in nursing is an essential component of professional accountability and quality care. Over many years, improving the nurses' quality of thinking through developing the educational curriculum, teaching methodology, and research was a serious concern for nursing higher education (Paul 1993). Critical thinkers in nursing exhibit these habits of the mind: confidence, creativity, flexibility, intellectual integrity, open-mindedness, and reflection. Critical thinkers in nursing practice the cognitive skills of analyzing, applying standards, discriminating, information seeking, logical reasoning, predicting, and transforming knowledge (Chelsea 2019; Harrison 2019; Martin 2009). However, caring behavior is considered a positive predictor for critical thinking when applying strategies to enhance nursing students' critical thinking skills (Harrison 2019). Critical thinking abilities are relevant to clinical nursing practice. The analysis of critical thinking abilities among Registered Nurses (RNs) can be valuable for both the higher education systems and educational professional development programs in the hospital settings. Accordingly, examining the

relationship between the individual's critical thinking and their continuous education outside collegiate experience will establish the relevance of the level of nursing education of the experienced RNs and the progress of their critical thinking abilities (Hasanpour & Kakavand 2019).

A variety of methods and instruments are available to assess critical thinking. These include the California Critical Thinking Skills Test (CCTST) and the California Critical Thinking Disposition Inventory (CCTDI), as well as the Watson-Glaser Critical Thinking Appraisal (WGCTA). The CCTST consists of 34 multiple-choice items that are capable of assessing the critical thinking skills identified in the Delphi report.

The CCTDI is a 75 Likert-repose instrument that uses seven subscales to identify one's disposition towards critical thinking (Caruso, Rowland, Lovelace, Saunders & Israel 2016). The California Critical Thinking Skills Test (CCTST) is an objective measure of the core reasoning skills needed for reflective decision making concerning what to believe or what to do (Raymond-Seniuk, 2014). The CCTST is designed to engage the test taker's reasoning skills. Multiple-choice items use everyday scenarios, appropriate to the intended test-taker group. Each item requires that the test-taker make an accurate and complete interpretation of the question. Any specific information needed to respond correctly is provided in the question problem itself. The test items range in difficulty and complexity. Different questions progressively invite test-takers to analyze or interpret information presented in text, charts, or images; to draw accurate and warranted inferences; to evaluate inferences, explain why they represent strong reasoning or weak reasoning, or to explain why a given evaluation of inference is strong or weak. The instrument is typically administered in 45-50 minutes; the instrument's length is set to permit maximum performance within the range of possible effort for the intended test-taker group (Alkharusi, Al Sulaimani & Neisler, 2019; McMullin 2018).

Regarding the characteristics of the participants in this study, the current results revealed that more than half of them were in the fourth year and about one-quarter of them was internship students while only slightly more than one fifth was graduated. This result differs with the study conducted by López et al., (2020) titled 'the impact of an educational intervention on nursing students' critical thinking skills: which detected that all subjects sample consisted of 112 first-year

undergraduate students with limited knowledge and experiences. In addition, it is inconsistent with the research performed by Liu, Hsu, Hung, Wu & Pai (2019) titled 'The Effect Of Gender Role Orientation On Student Nurses' Caring Behavior And Critical Thinking', which reported that all of the studied sample were undergraduate students. Furthermore, the participants' gender in the study was inconstant with the study of Alkharusi, Sulaimani and Neisler (2019) predicting critical thinking ability of Sultan Qaboos university students as they examined both genders. However, the current study focused on the female Arabic nurses was the same as in the study at Sharjah and Fujera Institutes of Nursing in UAE entitled 'Critical Thinking Skills Of Nursing Students In Lecture-Based Teaching And Case-Based Learning' (Kaddoura 2011), in which all (100 %) of the participants were females, whose primary spoken language is Arabic. However, the marital status of the current study presented that most of the participants with a (69%) were single and only (31%) married, which is consistent with a study conducted in Egypt where most of the participants were single (77.5%) compared to a minority (22.5%) who were married (Mahmoud and Mohamed, 2017). Similarly, Kaddoura's (2011) research presented that 90.3 % of the overall participants were single and 9.7 % were married.

In terms of the ages of studied participants, the current results showed that about three-quarters of studied subjects ranged in age from 18 - < 26 years, and one-fifth of them varied between 26- < 34 years with a mean age  $24.02 \pm 4.63$  years. These results would be due to more than half of them being in the fourth year. These results differ from the study performed by Yilmaz, Kelleci & Aldemir (2018) which focused on studying the effects of high-fidelity simulation training on critical thinking and problem solving skills in nursing students in Turkey, and which reported that the mean age of the studied subjects was  $18.70 \pm 1.17$  (min = 17, max = 23). On the other hand, this study was similar to that conducted by Hasanpour, Bagheri & Heidari (2018) investigating the relationship between emotional intelligence and critical thinking skills in Iranian nursing students, whose subjects had a mean age of 24.58 years. Correspondingly, in Kaddoura's (2011) study, the majority of the participants fell into the 19-22 age groups (81.5 %).

Concerning the time needed to finish the critical thinking test, the current results detected that the majority (87.38%) of the participants spent time on test ranged between (15 - 45 minutes). While only (4.85%) of the participants spent (> 45 minutes) with Mean SD of  $34.87 \pm 11.53$ . These results match those in the study performed by Carbogim et al., (2018) about educational

intervention to improve critical thinking for undergraduate nursing students: In this randomized clinical trial, the mean time needed was 31.47 minutes. In addition, Mahmoud and Mohamed (2017) stated that the majority of their participants (196 nurses) consumed all the 45 min to do the test. On the other hand, this studies results are not reflected in the study conducted by Raymond, Profetto-McGrath, Myrick & Streaan, (2018) entitled in Nurse Educators' Critical Thinking: A Mixed Methods Exploration, which stated that participants only needed 20 minutes to finish the CCTST scale. According to Kaddoura (2011), an average time taken by participants to complete the test was more than fifty minutes, which was only the case for the minority in the current study.

For the graduate nurses cohort, the present study revealed that the mean score of graduate nurses related overall, deduction, and evaluation subscale was  $12.23 \pm .77$ ,  $3.50 \pm .44$ , and  $4.73 \pm .37$ , respectively. Carvalho et al. (2020), in their study about the measurement of general critical thinking in undergraduate nursing students, reported that the mean score of general, deduction and evaluation was 15.0 (3.5), 6.9 (2.0) and 5.6 (1.9). The results of the current study revealed that the mean score of graduate nurses related analysis, inference, and induction domains were  $3.36 \pm .24$ ,  $5.36 \pm .41$ , and  $7.50 \pm .57$ , respectively. Meanwhile, Babamohamadi et al. (2017), reported mean scores of analysis, inference and induction subscale was  $2.70 \pm 1.46$ ,  $3.25 \pm 1.37$  and  $4.10 \pm 1.92$ , respectively in their study of critical care nursing.

Mean scores for internship nurse students related to overall, analysis, inference, evaluation, induction and deduction subscales were  $10.75 \pm .58$ ,  $3.13 \pm .30$ ,  $4.63 \pm .41$ ,  $3.00 \pm .28$ ,  $6.29 \pm .44$  and  $4.46 \pm .34$ , respectively. Fero et al. (2010) conducted a study about critical thinking skills in nursing students which reported mean scores of analysis, inference, evaluation, and induction at 4.94 (1.41), 9.64 (2.56), 5.08 (2.01) and 10.83 (2.48), respectively. Also, Azizi-Fini, Hajibagheri & Adib-Hajbagheri (2015) in their study about critical thinking skills in nursing students, comparing freshmen and senior students, reported that mean scores for inductive reasoning, deductive reasoning and evaluation were  $4.70 \pm 1.91$ ,  $5.26 \pm 1.87$  and  $4.18 \pm 1.61$ .

Mean scores of undergraduate fourth-year student regarding overall, analysis, inference, evaluation, induction, and deduction subscales was  $10.93 \pm .39$ ,  $3.35 \pm .17$ ,  $4.65 \pm .22$ ,  $2.93 \pm .17$ ,  $6.18 \pm .27$  and  $4.75 \pm .22$ , respectively. Meanwhile, Pitt et al. (2015) in their study about the

influence of critical thinking skills on performance and progression in a pre-registration nursing program, detected that mean scores of student nurses related to analysis, inference, evaluation, and inductive reasoning were  $3.27 \pm 1.44$ ,  $2.53 \pm 1.22$ ,  $3.39 \pm 1.34$  and  $6.06 \pm 1.84$ , respectively. Also, Noone & Seery (2018) reported mean scores for analysis and evaluation subscales of  $3.24 \pm 0.99$  and  $3.05 \pm 0.58$ .

The present study revealed that mean scores of graduate nurses were slightly higher than internship, and undergraduate nurses. However, there was no significance between mean scores of California critical thinking skills domains overall, analysis, inference, evaluation, induction, and deduction domain between three studied groups “graduated, internship and fourth-year students”, which indicated a p-value less than 0.05. Generally, the ability of students to use critical thinking skills is low and this may vary due to how their education system appreciated the importance of critical thinking as a fundamental tool in learning. It suggests that critical thinking should be taught in both the formal academy education and the implied curriculum. In other words, the hidden curriculum, which plays a crucial role in universities, might help to develop and improve critical thinking skills in BSc nursing students. These results supported the study conducted by Babamohamadi et al. (2017), which reported that BSc students of nursing scored lower compared to MSc students, although the difference was not significant. In addition, it concurs with Azizi-Fini et al. (2015), who reported that there were no significant differences between freshmen and senior students in terms of their mean scores for interpretation, analysis, evaluation, and inductive reasoning and deductive reasoning subscales.

The results of the current study presented that the ability of the nursing students, interns and graduates to use critical thinking skills is low in general. Noone & Seery (2018) reported in their study about critical thinking dispositions in undergraduate nursing students that nurse educators need to develop their knowledge of critical thinking dispositions and foster these attributes throughout the pre-registration nursing degree program. Clinically based scenarios that challenge nursing students and invoke questioning contribute to critical thinking development. Constitutional bodies responsible for nurse education and nurse educators must continue to encourage critical thinking. Amini and Fazlinejad (2010) reported that this is a global problem in nursing education, and several studies indicate a lack of critical thinking and problem-solving skills in undergraduate nursing programs. It has also been reported that although basic

skills of critical thinking are taught to nursing students, they cannot apply them in solving problems they commonly encounter, and this may be considered as a sign of failure in nursing education systems. Also, Newton & Moore (2013) detected that CT data are needed across the nursing curriculum from basic baccalaureate and accelerated second-degree students in order for the nurse educators to develop cohort-specific pedagogical approaches that facilitate critical thinking in nursing and produce nurses with good critical thinking skills for the future.

According to the mean scores of CCTST domains related to students' age, the current study proved that there was no difference between means scores of CCTST scale between three age groups detected through statically test with p-value more than 0.05. These results were inconsistent with the study performed by Ludin (2018) about whether good critical thinking equals effective decision-making among critical care nurses, which reported that the one-way ANOVA analysis of demographic factors contributing to the nurses' critical thinking disposition showed that age and working experience had a significant association with critical thinking disposition ( $p < 0.05$ ). In addition, it contradicts Raymond et al. (2018) titled in Nurse Educators' Critical Thinking: A Mixed-Methods Exploration, and also Choi, Hwang & Jang (2017), who detected that the factors affecting the nurses' critical thinking disposition included age ( $F=7.23, p<.001$ ).

Related to total scores of CCTST, the current results detected that more than half of studied participants scored Moderate in the analysis domain. In addition, more than two-thirds had Not-manifested scores related to the Inference domain. Three-fifths of them and more than two-thirds had Not -manifested related to evaluation and deduction domains. In addition, two-thirds had Moderate scores related to the Induction domain. These results were inconsistent with the study conducted by Ali & Elhadary (2019) about the effect of case-based learning versus demonstration and re-demonstration on nursing students' clinical performance and critical thinking. However, they mirrored the findings of other studies on the critical thinking ability of Sultan Qaboos University students (Alkharusi et al. 2019) as well as the results of a study about the educational intervention to improve critical thinking for undergraduate nursing students (Carbogim et al. 2018).

Finally, concerning the correlation between domains of CCTST, the present results showed a highly significant positive correlation between overall domain and analysis, inference, evaluation,

induction, and deduction variable at  $p$ -value  $< 0.01$ . Also, there was a highly significant positive correlation between analysis and induction, deduction. These results were consistent with the study conducted by Abbasi & Izadpanah (2018), which reported that there was a high correlation between the overall critical thinking scores and the subscale (domain scores) of California Critical Thinking Skills Test. Meanwhile, there was a highly positive correlation between inference and induction, deduction at  $p$ -value  $< 0.01$ . In addition, there was another a high correlation between induction and all domains at  $p$ -value  $< 0.01$  except no correlation with the deduction domain. Moreover, there was a highly significant correlation between deduction and overall, analysis and inference domains at  $p$ -value  $< 0.01$ . These results supported Aein & Aliakbari (2017) about the effectiveness of concept mapping and traditional linear nursing care plans on critical thinking skills in a clinical pediatric nursing course, who detected that there was a high correlation between the domains (subscales) of CCTST.

In conclusion, the present study revealed that the correlation between CCTST domains has a highly significant positive correlation between overall domain and analysis, inference, evaluation, induction, and deduction variable at  $p$ -value  $< 0.01$ . In addition, there was a highly significant positive correlation between analysis to examine how the test takers interrelate in the development of arguments, induction and deduction. In addition, there was a highly significant positive correlation between analysis and induction, deduction, and high relationship between induction and all domains at  $p$ -value  $< 0.01$  except no correlation with the deduction domain. Moreover, there was a highly significant correlation between deduction and overall, analysis and inference domains at  $p$ -value  $< 0.01$ . However, the mean scores of graduate nurses were slightly higher than an internship and undergraduate nurses based on their advanced clinical experiences, and the study proved that there was no difference between means score of CCTST scale within the three age groups detected through static testing with  $p$ -value more than 0.05. Moreover, there was no significance between means score of CCTST domains overall, analysis, inference, evaluation, induction, and deduction domain between three educational level "graduated, internship and fourth-year students" indicated a  $p$ -value less than 0.05.

Generally, students' ability to use critical thinking skills is more than half of studied participants had a Moderate score related analysis domain where the individuals can investigate the reasoning skills to examine how they interrelate in the development of arguments. This may

vary due to how their education system prepared them to develop their critical thinking as a fundamental tool in learning. It proved that critical thinking should be taught in both the formal academy education and the implied curriculum. The overall score describes the total power and weaknesses in using reasoning to form reflective judgments about 'what to believe or what to do?' and achieving high scores in the five domains' core reasoning skills could lead the participant to achieve a high overall score to indicate good decision-making and thoughtful problem solving (Insight Assessment 2020). Finally, there is a highly positive correlation between inference skills to draw conclusions, make decisions, and possible values from reasons and pieces of proof and inductive reasoning, where people draw their decisions based on case studies, prior experience, statistical analyses, simulations, events, experiences and behaviors.

### **5.1.2 Discussion of the Results of Research Question 2:**

To answer the second research question about what influence, if any, the workplace preparation had on the three different nursing cohorts' practices concerning critical thinking, moral reasoning, and cultural sensitivity in the UAE, the researcher collected the results below through the focus group interview with the three nursing cohorts and explored their responses and views about workplace preparation.

Initially, regarding the studied participants' general attitude related critical thinking, the present study revealed that almost all of them had a positive attitude about the importance of daily nursing clinical decisions. In addition, they all agreed on the importance of nurses' role in handling the patients' everyday cultural and moral dilemmas. However, they all agreed that their nursing education needs to be improved so they could make effective moral and cultural clinical decisions. These results were consistent with Mboineki et al. (2019) about the status of nurses and doctors collaboration in clinical decision and its outcomes in Tanzania, which reported that nurses feel disrespected when medical doctors (MDs) ignore their opinions and do not allow them to take decisions about their patients' health. Most respondents reported that nurses must be allowed to participate in clinical decisions on the best treatment for their patients. This is supported by Almoallem et al.'s (2020) study, which detected that healthcare providers in Riyadh hospitals faced

multiple ethical challenges while providing care to their patients and most of the ethical dilemmas came from having patients from different cultures in the country. However, Almutairi et al. (2019) reported that miscommunication is often the main challenging source of the provider and patient care difficulties. Discrepancies between meanings and intent are often at the root of the troubles and these discrepancies often go unrecognized at the healthcare services. The special character of cross-cultural communications makes it imperative that providers address these issues with care and work to develop their own communication skills.

The results obtained from interview data indicated that the influence of curriculum and workplace, multicultural environment and moral dilemmas contributed to shape the UAE nurses' critical thinking skills. The main findings related to this question were that clinical practice experiences improved the nurses' clinical decision-making and impacted positively on improving the nurses' critical thinking abilities. In addition, they influenced positively on improving the quality of education although basic skills of critical thinking are taught to nursing students. These findings are consistent with the results published in the literature by Amini and Fazlinejad (2010), who reported that limitations within the nursing curriculum could be considered a global problem in nursing education.

To have in depth understanding of the study's second research question, the researcher discussed how the workplace experiences influenced the UAE nursing education system concerning curriculum, clinical experiences, moral reasoning, and cultural sensitivity individually with the participants. The discussion was linked with four main findings of the current nurses' critical decision-making conditions. Each of the four items is discussed, connecting it to the related literature review and researcher interpretations.

The following sections present discussion of the four main response results that emerged.

#### **5.1.2.1. Nursing Education and critical thinking preparation.**

The main findings of this study are that the UAE nursing education is a dynamic system that is committed to delivering the highest quality of patient care through preparing safe and

professional nurses guided by clear ethics through the highest standards of education. The participants from the three nursing cohorts confirmed that their education curriculum was meeting their educational needs and requirements to practice safe and professional holistic care which is concurs with Hooper et al., (2020). Besides, it was found that UAE nursing education is frequently developed to enhance the students' critical thinking and enable them to be professionally competent nurses with respectable clinical thinking, moral reasoning, and culturally sensitive skills. These results are supported by previous studies on the UAE nursing education, which stated that the UAE nursing education leaders frequently reformed the existing nursing educational curriculum to achieve outstanding professional nurses in the UAE healthcare system (Wollin & Fairweather 2012; Hooper et al., 2020). This finding also confirms earlier research where UAE nursing education programs are argued to reconsider their educational objectives to encourage their nursing students' critical thinking abilities to adapt to the expected innovations in the complex nursing field (Abu Hantash & Van Belkum 2016; Brownie et al. 2015).

Gholami et al. (2016) found that nursing education leaders understand that critical thinking is central to excellence in nursing education, practice and research. The results show that the curriculum is designed to deepen integration between critical thinking and problem solving within the participants' teaching courses subjects by addressing intensive reflection on real-life issues. All the participants agreed that the class discussion about real-life cases with deep thoughts among the students and their lecturers enhanced their critical thinking and problem-solving skills. Reflection and class discussion are important for all learners, and a process of scaffolding to help students understand the learning process, think differently and learn from others. This is aligned with López et al.'s (2020) quasi-experimental study that proposed that the educational intervention improved the undergraduate nursing students' critical thinking skills to improve the future nurses' ability to make safe clinical decisions in a reflective manner where reflection is also known in different terminology as evidence-based method. Likewise, Kaddoura's (2011) research revealed that case-based learning (CBL) participants performed better in the total critical thinking score than those who had learned through traditional teaching. Similarly, Li, Ye and Chen (2019) claimed that nursing case-based learning was an effective way to develop nursing students' critical thinking abilities. These findings are consistent with Mohamed and Mohamed (2017), who found

that a cohort of nurses were motivated to search for answers to examine the ideas that challenge them and direct critical thinking to search for clarity.

This study also shows that cultural sensitivity and moral reasoning were integrated into the current nursing education curriculum within designated theoretical courses to empower the students to determine what is right and what is wrong during clinical judgments. The UAE nurses have faced many complications of working inside a significant linguistic, multi-culturally diverse context. Accordingly, leaders supported ‘culturally competent care’ as a key requirement within a limited Emirati or mixed Arab origin community. However, the patient’s appropriate treatments are relying on the health team's linguistic abilities, cultural sensitivity and knowledge (Aderibigbe et al 2016). A complex condition arose that required nursing managers’ to deliver further induction programs to include ethical and moral education, including Islamic Arabic values for the expatriate nurses to address any cultural sensitivity (Campinha 2011; Aderibigbe et al 2016). It is important to note that the present evidence relies on developing the critical thinking of the nursing students through their theoretical curriculum preparation plans, and the result contradicts that of Ludin (2018), who argued that the working experience significantly impacted on the clinical decision-making of all the nursing students away from the theoretical classes. This is similar to Victor-Chmil (2013), who found that better cognitive and metacognitive skills of the nursing students developed through critical thinking and critical reasoning in their clinical settings. On the other hand, that study supports the current study’s results as it found that different proper educational strategies are needed to apply any change in using the students' critical thinking alongside work on developing the required tools that can help to measure that change. In the same way, Oducado, et al. (2019) argued that the nursing academic institutions have to work continually to bridge the gap between theory and practice by promoting the transfer of learning from classroom to actual care setting.

The theoretical courses could develop the students’ critical thinking and improve their clinical judgment, but also the current study shows that the reflective discussion meetings at the simulation labs and at the clinical setting influenced them to develop their critical thinking skills in the class. The reflective meetings enable the students to express their daily experiences freely to their instructor who will work on providing further explanations and directions from different aspects with a clear picture of the situations. In the same way, a research study in Cairo-Egypt found that

the use of structured laboratory stations with extensive reflection and discussion on a case-based, active learning education strategy increased the nursing students' clinical performance level in a safe and controlled environment (Ali & Elhadary 2019). Correspondingly, López et al. (2020) argued that the nursing educational intervention led to an improvement in every critical thinking skill that contained seminars, lectures, case studies, and a majority of problem-solving activities. On the other hand, the research conducted by Alharbi (2019) on nursing students at Indiana University found that there was no significant increase in the nursing students' critical thinking skills after their exposures to the simulation lab experiences at the college. However, they focused on critical thinking skills and metacognitive awareness in nursing students in a critical care-nursing course, comparing the effects of problem-based learning and the traditional lecture method. They claimed that placing reflection and self-directed learning at the center of the PBL approach leads to optimal outcomes. The study found that education through scenarios could instigate the students' attempt at reflection during, before and after the occurrence of events. Moreover, intensive curriculum reforming was recommended to adopt active learning (Gholami et al. 2016). Furthermore, professional development training sessions for the teaching staff were required to train them to utilize the CT within their teaching strategies (Azizi-Fini, Hajibagheri & Adib-Hajbaghery 2015).

The current study shows that the UAE nurses found that their current curriculum does not pay full attention to peer influence and peer teaching in developing their critical thinking abilities as they do not meet and interact a lot in the scheduled short time breaks. They feel that peer interaction is essential in enlightening and humanizing students' critical thinking, moral reasoning, and cultural sensitivity skills during their daily interaction with each other to attain educational goals. The study also shows that communication and peer interaction within the multicultural environment at the college will enable them to understand the multicultural workplace and allow them to easily understand their patients' needs. In contrast, a research conducted by Gholami et al. (2016) found that the guided mutual peer teaching approach had led to no significant improvements in the metacognitive awareness and skills in the experimental group, which shows that this teaching approach was ineffective in the development of metacognitive skills of the nursing students. These findings are consistent with Alkharusi, Sulaimani and Neisler (2019), who

found that the peer learning has a negative effect on the students' critical thinking as they are copying the information when they interact without assuring their peers' understanding.

On the contrary, Pålsson et al. (2017) investigated critical thinking of nursing students in clinical practice education, and indicated that peer learning is a useful method that improves nursing students' self-efficacy to a greater degree than traditional supervision does. These findings are consistent with a recent study that found peer learning is an educational and structured learning activity that prepares the students for collaboration and reflection. It limits the time and pressure on the preceptors at the hospitals who can act as observers and provide a board discussion for the students' thoughts and reflections (Stenberg et al. 2020).

#### **5.1.2.2. Clinical experience and nurses critical thinking development.**

This study's results showed that the UAE nurse's critical thinking was developed and advanced through their actual clinical experiences as those formal clinical exposures enabled them to provide their patients with correct clinical judgments. Decision-making and problem-solving abilities are essential to provide the patients with safe and holistic healthcare services through assuring culturally competent care with good moral reasoning skills. Whenever they were asked to take different clinical decisions concerning their multicultural patients' health, they found it too hard to judge people, and difficult to satisfy all. Constructivists supported the use of the 'Practice-Based Simulation Model' to reform nursing teaching strategies. They found this model to be a good way to assure the development of the CT of the nursing students (Park et al. 2013). These findings are consistent with Mahmoud and Mohamed (2017), who recommended raising the nurse's CT and problem-solving awareness in the clinical setting using updated teaching strategies for better patient health outcomes. Victor-Chmil (2013) claimed that for better nursing clinical practices, educators need to realize that preparing professional nurses who utilize their' cognitive, metacognitive, psychomotor, and affective processes' efficiently through critical thinking and clinical reasoning in their clinical settings is vital. Proper educational strategies are needed to apply the change in using the students' critical thinking and improving the assessment tools used in measuring that change. Likewise, Siburian, Corebima and Saptasari (2019) concluded that

empowering essential thinking skills and creative thinking skills by using the right learning strategies should focus on educators, researchers and educational developers. However, teaching strategies based on constructivist theories should be encouraged as they play a significant role in improving student learning and critical thinking during the training of undergraduate nursing students (Carvalho et al., 2020).

The participants of this study requested further clinical training and clinical preparation in critical thinking skills to have safe and competent clinical decision-making skills until they gain their own clinical judgment skills from their actual clinical experiences. However, they stressed the important role of the college in empowering and developing them to be respectable critical thinkers for every clinical situation. These findings are consistent with Kaddoura's (2010) study 'New Graduate Nurses' Perceptions of the Effects of Clinical Simulation on their Critical Thinking, Learning, and Confidence', where the students' sample was selected to be trained at the biggest free educational hospital in the USA. The study found that the hospital setting provides an advanced 'clinical simulation center' for the students which is training them in a special high quality and advanced nursing care skills programs. In addition, many researches supported the effectiveness of close monitoring and clinical training for nursing graduates to improve the quality of their patients' health outcomes (Duckett & Moran 2018; El Haddad, Moxham & Broadbent 2017; Murray, Sundin & Cope 2019).

#### **5.1.2.2. Curriculum and clinical preparation of nurse's moral reasoning and cultural sensitivity.**

The study showed that both the participants' curriculum and clinical settings have inspired and introduced them to develop their decision-making skills to provide high quality and safe nursing care. The discussion in the class, simulation labs and clinical training at multicultural healthcare settings in UAE engaged and empowered them in many problem-solving tasks through different cases and provided the unusual context or constraints for superior practice and discussions. The participants were trained to accept the differences between their local culture and other cultural groups. In addition, they were prepared to have a stable and safe clinical decisions from all aspects,

as they understand that one solution could not fit all patients. It is the same as the findings of Mohamed and Mohamed (2017) who revealed that the nurse's critical thinking was enhanced in the community clinical settings when they dealt with more complicated situations and were exposed to new unusual ideas to make decisions beyond the routine, more so than the regular nurses at the hospital.

An important implication of the findings of this study is that the students' theoretical orientation and preparation for ethical and moral challenges and resolutions are required for the nurses in any multicultural society. Almoallem et al. (2020) recommended the healthcare educational programs to integrate the ethical knowledge within their curriculum to empower the healthcare professionals to face the multiple ethical challenges in Riyadh hospitals within the Saudi society, which is a serious problem that compromises the caregiver's well-being, as it was a motive for the intention of healthcare providers to leave their jobs. Moreover, others found that communication skills and cultural sensitivity are essential elements for eliminating language barriers and facilitating culturally sensitive care among healthcare professionals. The integration of cultural awareness using effective teaching strategies in the nursing curricula showed that the students could put their theoretical knowledge into practice later (Unver 2019).

On the other hand, the study found some limitations in improving the nurse's critical thinking, moral reasoning, and cultural sensitivity abilities in many clinical situations, such as the daily argumentative and unexpected ethical dilemmas in the UAE. These findings are consistent with Abou Hashish and Bajbeir's (2018) study 'Emotional Intelligence among Saudi Nursing Students and its Relationship to their Critical Thinking Disposition at College of Nursing -Jeddah, Saudi Arabia'. Their study found that fostering emotional intelligence and critical thinking disposition among nursing students could enhance their problem-solving skills and develop their clinical judgment abilities, leading to high standard clinical services. These results are in clear agreement with other studies, which have shown that a significant relationship was found between empathy and critical thinking skills in nursing students. Using these elements as a teaching technique for nursing education courses helped to develop good nurse-patient relationships and improved patient care in Iranian nursing students (Hasanpour, Bagheri & Ghaedi Heidari 2018). The nurses' ability to communicate with their patients of other first languages was another factor in supporting their

culturally competent care as a result of their daily private interaction with a multicultural neighbor or taking care of international patients at the hospitals (Gözüm, Tuzcu & Kirca 2015).

Unver (2019) found that societies are changing into multicultural structures with globalization and immigration because of the recent wars. For patient safety and to prevent inequalities in health care, cultural sensitivity is required to serve cultural and language diversity during these changes. It is recommended that nursing education leaders initiate simulation practices as an alternative method in the development of cultural sensitivity skills of their students. In addition, a complex condition arose in this study as the participants found issues among the expatriate healthcare professionals from other cultures and that shows their inability to understand and meet the local patients' needs. This finding is consistent with one study that required 'non-Arabic nurse-leader-managers' to deliver further induction programs to include ethical and moral education, including Islamic Arabic values for the expatriate nurses who may encounter issues of cultural sensitivity (Campinha 2011; Aderibigbe et al. 2016).

The nursing image was another challenging issue facing the UAE nurses of this study, and it was limiting and discouraging them from practicing decision-making and moral reasoning skills freely within their culture. These findings are consistent with El-Haddad (2006), who has argued that nursing is considered the last choice for local students to go for because of the cultural limitations to the career, and its general rejection because of the current nursing image to the nurses in the UAE community. Mboineki et al. (2019) elaborated that nurses feel disrespected when medical doctors ignore their opinions as they think they have limited knowledge and this leads them to treat the nurses as inferior and ignorant. Nurses and medical doctors have to collaborate in finding the best decision for their patients at the health care systems. Nurses have to believe in their own proposed treatments and not follow the doctors' instructions blindly, but also make clinical decisions for their patients.

## **5.2 Conclusion:**

This research study explored the impact of the nursing education curriculum and workforce preparation on students' critical thinking, moral reasoning, and cultural sensitivity in UAE. An concurrent mixed-method was used to examine critical thinking among three nursing cohorts'

graduates, internship, and fourth-year. The quantitative data from the California Critical Thinking Skills Test (CCTST) form B consists of 34 multiple-choice items that are capable of assessing the critical thinking skills as identified in the Delphi report, and it presented their (overall, analysis, inference, evaluation, induction, and deduction) scoring that is administered in 45-50 minutes.

The majority of the participants have a weak percentile as this result is predictive of ‘difficulties with educational and employment related demands for reflective problem-solving and reflective decision making’. Followed with some cases of moderate percentile that indicates the potential for skills-related challenges when engaged in reflective problem-solving and reflective decision-making associated with learning or employee development. Adding to that, only one participant was superior in comparing their scores for CCTST overall with the national comparison percentiles in the same profession. This result indicates that only one participant had critical thinking skills that is superior to the vast majority of test takers. Skills at the superior level are consistent with high potential for more advanced learning and leadership.

The study findings demonstrated that the majority of the participants have a Weak percentile, which ranged (8-12) of the overall score, followed with a Moderate percentile, while only one student scored Superior percentile compared to the benchmark scale of the national percentile score. More than half of them were in the fourth year, and about one-quarter of them was internship students while only slightly more than one fifth was graduated. The present study revealed that mean scores of graduate nurses were slightly higher than internship and undergraduate nurses although they are the lowest number among the participants based on their advanced clinical experiences. However, there was no significant difference(s) between the mean scores of CCTST domains overall, analysis, inference, evaluation, induction, and deduction domain between the three studied groups with a p-value of less than 0.05. Related to total scores of CCTST, the results detected that more than half of studied participants had a Moderate score related analysis domain. In addition, more than two-thirds had ‘Not- manifested’ scores related to the inference domain. Three-fifths of them and more than two-thirds had ‘Not- manifested’ related to evaluation and deduction domains respectively. Also, two-thirds had Moderate scores related to the Induction domain. Concerning the correlation between domains of CCTST, the present results showed a highly significant positive correlation between overall domain and analysis, inference, evaluation, induction, and deduction variable at p-value < 0.01. This describes the total power and weaknesses

in using reasoning to form reflective judgments about 'what to believe or what to do'. Also, there was a highly significant positive correlation between analysis and induction, deduction. Meanwhile, there was a highly positive correlation between inference and induction, deduction at p-value <0.01. In addition, there was a high correlation between induction and all domains at p-value <0.01 except no correlation with the deduction domain. Finally, there was a highly significant correlation between deduction and overall, analysis, and inference domains at p-value <0.01. According to the mean scores of CCTST domains related to students' age, the current study proved that there was no difference between means score of CCTST scale between the three age groups.

The qualitative data of the semi-structured focus group interviews of the Emirati and expatriate female nursing students and graduates intended to explore the three cohorts' preparations in critical thinking, moral reasoning and cultural sensitivity, as well as their clinical preparation. Initially, the studied participants revealed that almost all of them had a positive attitude regarding the need for competent clinical decision skills. They understand the importance of nurses in handling the patients' everyday cultural and moral dilemmas at their health context that could be advanced through their nursing education. The results show the contribution of multicultural education and clinical moral dilemmas to shape the UAE nurses' critical thinking skills. However, clinical practice experiences improved the nurses' clinical decision-making and influenced positively on improving the nurse's critical thinking abilities.

The main findings of this study are that the UAE nursing education is a dynamic system that is committed to delivering the highest quality of healthcare through preparing safe and professional nurses guided by clear ethics and high standards education. The three nursing cohorts confirmed that their education curriculum met their educational needs to practice safe and professional holistic care to their patients. Professional and competent nurses should have robust critical thinking, moral reasoning, and culturally sensitive skills. Nursing education leaders understand that critical thinking is vital to excellence in nursing education, practice, and research.

The results show that the curriculum is designed to deepen the integration between critical thinking and problem solving within all the teaching courses by addressing intensive reflection on real-life issues. Besides, the class discussion about real-life cases with deep thinking enhanced

their critical thinking and problem-solving skills that bridged the gap between theory and practice. The study also shows that cultural sensitivity and moral reasoning were also integrated into their nursing curriculum within designated theoretical courses to empower them to determine what is right and what is wrong during clinical judgments.

The current study shows that the UAE nurses found that their current curriculum is not putting enough attention on peer teaching in developing their critical thinking abilities as they meet in short time breaks. They feel that multicultural peer interaction is essential in enlightening and humanizing students' critical thinking, moral reasoning and cultural sensitivity skills to better understand their patients' needs. The study shows that the UAE nurses' critical thinking was developed and advanced through their actual clinical experiences as those formal clinical exposures enabled them to provide their patients with correct clinical decisions, as they found it too hard to judge people and it is hard to satisfy all patients.

The nursing image was another challenging issue facing the UAE nurses of this study, and it was limiting and discouraging them from practicing decision-making and moral reasoning skills freely within their culture. Mboineki et al. (2019) elaborated that nurses feel disrespected and restricted to practice clinical judgment and problem solving skills when medical doctors ignore their opinions as they think they have limited knowledge, which leads them to treat the nurses as inferior.

In conclusion, this concurrent mixed-method was used to examine critical thinking among three nursing cohorts' graduates, internship, and fourth-year utilizing the quantitative data from the California Critical Thinking Skills Test (CCTST) form B consists and it presented their (overall, analysis, inference, evaluation, induction, and deduction) scoring that is administered in 45-50 minutes. The qualitative data of the semi-structured focus group interviews of the Emirati and expatriate female nursing students and graduates intended to explore the three cohorts' preparations in critical thinking, moral reasoning and cultural sensitivity. The majority of the participants have a weak percentile as this result is predictive of 'difficulties with educational and employment related demands for reflective problem-solving and reflective decision-making. While only one participant was superior in comparing their scores for CCTST overall with the national comparison percentiles in the same profession and had critical thinking skills that is

superior to the vast majority of test takers and the nation. Alike the qualitative results as the studied participants revealed that almost all of them had a positive attitude regarding the need for competent clinical decision skills. The quantitative results revealed that mean scores of graduate nurses were slightly higher than internship, and undergraduate nurses although they are the lowest number among the participants based on their advanced clinical experiences. Accordingly, the moderate percentile that indicates the potential for skills-related challenges when engaged in reflective problem-solving and reflective decision-making associated with learning or employee development. The participants revealed at the interview that they understand the importance of nurses in handling the patients' cultural and moral dilemmas that could be advanced through their nursing education. In addition, the qualitative results showed the contribution of multicultural education and clinical moral dilemmas to shape the UAE nurses' critical thinking skills. However, the nursing curriculum and the clinical practice experiences improved the nurses' clinical decision-making and influenced positively on improving the nurse's critical thinking abilities in both methods.

### **5.3 Research Recommendations and applications:**

Some recommendations emerged as a result of the collected data analysis, presentation, and discussion for the two research questions for future research. In addition, there are some suggestions for the policymakers at the healthcare systems, nursing education institutions, and the Ministry of Higher Education.

#### **5.3.1 Research Recommendations:**

First of all, the results of this study were based on Abu Dhabi and SEHA healthcare settings, and on self-reported data. The researcher recommends future research to collect data from cohorts at the MOH healthcare settings, as it is the representative body for Dubai and the northern emirates to compare to the nurses' responses and ensure honesty and transparency. Comparison will enrich

the study findings by revealing differences with what was reported by the nursing cohorts in Abu Dhabi in SEHA hospitals.

The findings also recommended the constitutional bodies that are responsible for nursing education to reform the current nursing curriculums to accommodate critical thinking and moral reasoning skills to cultivate culturally competent nurses. In addition, nurse educators must continue to encourage critical thinking skills in every nursing course. Decision-making and problem-solving abilities are very essential to provide the patients with safe and holistic healthcare services through assuring culturally competent nurses with good moral reasoning skills to avoid misunderstanding their spiritual, cultural, and religious needs.

The nursing image was a challenging issue facing the UAE nurses in specific and Arabic nurses and nursing students in general. This study recommends greater research about the cultural image of nursing to identify the cultural limitations against the current need for local nurses. The findings will enable the nursing leaders to overcome the obstacles of the current nursing career and find suitable solutions to empower the local nurses to work proudly in their local community.

### **5.3.2 Applications:**

The findings of this study outlined below provide the nurses' leaders and nursing education stakeholders with guidance on which safe practices professional nurses might they adopt based on their culture to achieve better healthcare in a rapidly changing world:

An important implication of the findings of this study is that the students' theoretical orientation and clinical preparation for ethical and moral challenges and resolutions are required for the nurses in any multicultural society. The participants trained to accept the differences between their local societal groups and other cultural groups and prepared to have stable and safe clinical decisions from all aspects, as they recognized that one solution could not fit all patients. Understanding their patients' needs is a key component for successful and safe nursing care.

These results show the importance of integrating critical thinking as a fundamental tool in learning as the general ability of the students to use critical thinking skills was low, while their

moral reasoning and cultural sensitivity were advanced. Critical thinking should be taught in more depth in both the direct education and within the indirect curriculum. In other words, the hidden curriculum and peer interaction could play a crucial role in nursing education to develop nursing students' critical thinking.

This study strongly recommends further clinical training and clinical preparation on critical thinking skills to have safe and competent clinical decision-making skills until the nursing students gain their own clinical judgment skills from their actual clinical experiences. In addition, the study found a serious issue among the expatriate healthcare professionals from other cultures' as their inability to understand and meet the local patients' cultural, spiritual, and religious needs was questionable. This finding is constant with Aderibigbe et al. (2016), which recommended 'non-Arabic nurse-leader-managers' to deliver further induction programs to include ethical and moral education, including Islamic Arabic values for the expatriate nurses' to counter any cultural sensitivity.

The study showed that both curriculum and the clinical settings have inspired the nurses to develop their decision-making skills to provide high quality and safe nursing care. The class discussion, simulation labs, and clinical training engaged them in many problem-solving tasks through different cases and unusual contexts in the UAE multicultural settings.

The study shows that the UAE nursing curriculum needs to put more attention to peer teaching in developing the nurses' critical thinking abilities. Multicultural peer interaction is essential in clarifying and humanizing students' critical thinking, moral reasoning, and cultural sensitivity skills to better understand the patients' needs and provide holistic care.

The study shows that the UAE nurses' critical thinking was advanced through real clinical experiences and enabled them to provide their patients with correct clinical decisions. Increasing the clinical training contact hours will advance their correct decisions.

Finally, the nursing image was another challenging issue facing the UAE nurses, and it was limiting and discouraging them from practicing decision-making and moral reasoning skills instinctively within their culture as others treated them as inferior and ignorant.

### **5.3 Limitations:**

Every research study expects some limitations that can affect the researcher's plans. In fact, most researchers could not control the limitations of their studies and this might have an impact on their results (Gay et al. 2009). Although this study contributed to the literature on UAE nursing education and nursing practices, it still had certain limitations.

The first main limitation of the study result is generalizing the findings of the study to Dubai and the northern emirates including Sharjah, Ajman, Fujairah, Ras al-Khaimah, and Umm al-Quwain, as the study took place in one higher education institution only and its clinical affiliates within the emirate of Abu Dhabi. Accordingly, the researcher faced the same limitation with the health bodies in Abu Dhabi as it was difficult to receive SEHA ethical approval to conduct the study in their hospitals. It took more than seven months to be granted the authorization to send the CCTST questionnaire via SEHA email system and perform the focus group interview with their nurses. SEHA represents Abu Dhabi health care settings where the study took place while MOH is the representative body for Dubai and the northern emirates, and the researcher was not able to gain approval to conduct the study in their settings. The Institutional Review Board (IRB) and the nursing college (Scientific Research Committee) took another three months to approve research as the head of the committee resigned at the time of the study.

Another limitation of the study is the number of participants involved in the CCTST. The nurse's responses to the emails also took a while, and the online responses were limited, which required the researcher to seek another approach to visit the hospitals in person and collect their personal contacts as they are working at night shifts and it is not easy to track them. The researcher kept on following and guiding the participants to use their CCTST username and passwords to access the test, and that took her a very long time and many long phone calls, but this somehow raised the number of participants at the end. However, it cost the researcher a lot to pay for the CCTST tests if the nurses did not respond, as she had to order new usernames and passwords to replace the missing ones while the study was entirely self-funded. The researcher faced other limitations with booking the computer labs for the undergraduate students at the college, but this was eventually resolved, which increased the participant numbers. These limitations made the sample size of 103 Emirati and expatriate female nursing students and graduates small, compared

to the population, and limited the generalization potential of the results on the UAE whole nursing population.

Lastly, with the researcher's intention to keep the data secure and private, the researcher chose to do quantitative data collection processes, statistical analyses, focus group interviews, and audio transcripts. This took a lot of time to proceed from one method process to another.

#### **5.4 Scope for future studies**

These study findings were limited to female participants, as there are no male students at Abu Dhabi nursing colleges. A larger sample size that would cover all the emirates would help to generalize the findings. The male participants from the other emirates could identify the similarities and differences between male and female Emirati and expatriate nurses' critical thinking, moral reasoning, and cultural sensitivity, which might confirm the findings of this study or contradict them.

#### **5.5. Concluding note**

In conclusion, this concurrent mixed-method was used to examine critical thinking among three nursing cohorts' utilizing the quantitative data from the California Critical Thinking Skills Test form B consists. The qualitative data of the semi-structured focus group interviews of the Emirati and expatriate female nursing students and graduates intended to explore the three cohorts' preparations in critical thinking, moral reasoning and cultural sensitivity. The majority of the participants have a weak percentile as this result is predictive of 'difficulties with educational and employment related demands for reflective problem-solving and reflective decision-making. Alike the qualitative results as the participants revealed that most of them needed further preparations for competent clinical decision skills. In addition, the qualitative results showed the contribution of multicultural education and clinical moral dilemmas to shape the UAE nurses' critical thinking skills. However, the nursing curriculum and the clinical practice experiences improved the nurses' clinical decision-making and influenced positively on improving the nurse's critical thinking abilities in both methods.

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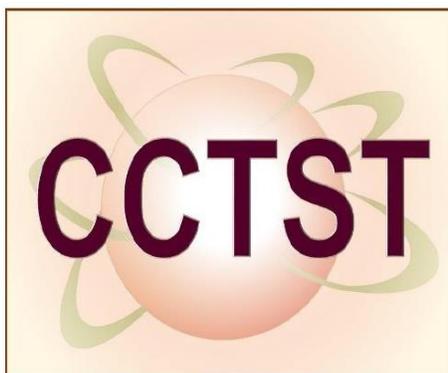
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## Appendix

Appendix A: CCTST user manual (2020).



### CALIFORNIA CRITICAL THINKING SKILLS TEST 2020 User Manual and Resource Guide



#### Critical Thinking Skills

- ✓ Analysis
- ✓ Interpretation
- ✓ Inference
- ✓ Evaluation
- ✓ Explanation
- ✓ Inductive Reasoning
- ✓ Deductive Reasoning
- ✓ Numeracy

This manual supports all forms of the CCTST college level assessment.  
Read online for links to additional information and updates.

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### ***Ethics of Performance Testing***

*Use, administration, scoring, and interpretation of the assessment tools published by the California Academic Press is the sole responsibility of the purchaser and user. Insight Assessment strongly recommends that persons using these testing tools observe ethical, academic, and professional standards in the use, administration, scoring, and interpretation of these instruments.*

*Many professional associations issue guidelines regarding ethical practices in educational testing. One might consult the American Association of Higher Education, One DuPont Circle, Suite 360, Washington DC, 20036 or the American Psychological Association Inc., at 1200 17th Street, NW, Washington DC, 20036.*

### **Priority of the Current Update**

This update supersedes all earlier versions of this assessment manual with or without ISBN numbers and all informational materials as may have been published on the Internet or in any other form or media by Insight Assessment / the California Academic Press regarding the assessment instrument(s) supported by this manual. In the event of discrepancies or inconsistencies between any earlier version of this manual or any other materials published by Insight Assessment / the California Academic Press and the current edition of this assessment manual, the information in the current edition of this manual should be given priority.

### **Complimentary Update**

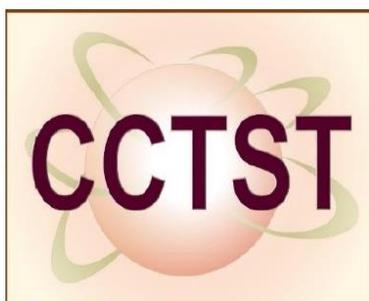
All Insight Assessment customers in good standing who have purchased use licenses for the assessment instrument(s) supported by this user manual can request a complimentary PDF of the most updated version of this user manual at any time. To receive your updated copy of this manual, phone Insight Assessment at 650-697-5628 or email us at [support@insightassessment.com](mailto:support@insightassessment.com)

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## User Manual and Resource Guide

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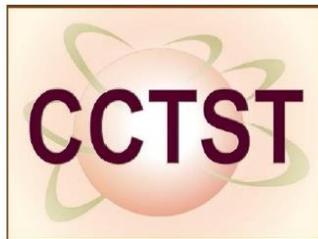
# Section 1: Critical Thinking



## Introducing the CCTST

**“Critical thinking is the process of purposeful, reflective judgment focused on deciding what to believe or what to do.”** This is the one sentence summary of an expert consensus description of what critical thinking is, and why it is important. This multidisciplinary consensus emphasized that when reasoning to a judgment, the process should entail consideration of all relevant evidence, context, standards, methods and conceptualizations. The details of the consensus study are published as the [APA Delphi Consensus Definition of Critical Thinking](#)<sup>1</sup> and in subsequent years this inter-disciplinary description of critical thinking has been endorsed worldwide by educators, business, government and community agencies.

The **California Critical Thinking Skills Test (CCTST)** is grounded in the APA Delphi definition of critical thinking. CCTST has been the premier instrument for measuring college level critical thinking skills for more than 30



years. Initial validation studies for the CCTST were conducted in 1988-1990 using a case control methodology at college-level institutions in California. Over subsequent decades the instrument has been updated to maintain its cultural relevance and expanded to offer a more robust scoring package. Today the CCTST provides calibrated assessment of undergraduate and graduate level students at colleges and universities of all types. CCTST now is used globally for admissions, advising, and outcomes assessment. Clients can select from among several different [comparison percentiles for various college populations](#). The score package includes a holistic measure of critical thinking (OVERALL Score),

benchmarked against a population comparison percentile score, and individual scale scores for the array of cognitive skills identified as core skills in the process of critical thinking.

Today the CCTST is supported by an item pool that has been developed and refined over a 40-year period. CCTST is tailored and calibrated for the college undergraduate and graduate level population. Assessments for discipline specific student groups are also available. Forms of the CCTST are continually updated to assure that that items are current and culturally relevant. Improvements have made to expand the range of scale scores and to supply comparison group percentiles. Initial validation studies and independent research document [the predictive validity and reliability](#) of the CCTST ([Section 5](#)).



<sup>1</sup> The complete account of the American Philosophical Association (APA) Delphi Study and the derived consensus definition of critical thinking is reported in the document entitled, “Critical Thinking: A statement of Expert Consensus for Purposes of Educational Assessment and Instruction” (Facione, P.A.) first published as ERIC Doc. NO.: ED 315 423, 1990. The [executive summary of the APA Delphi Report](#) is available as a free download on the Insight Assessment website.

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The CCTST provides an Individual Report and Group Score package:



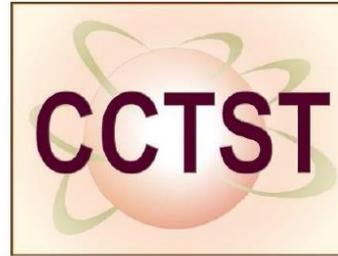
## Score Package and Scale Descriptions

The score report package for CCTST includes:

- An **OVERALL score** for critical thinking skills
- A **Percentile score** for a national comparison group

And scores for an array of cognitive skills:

- Analysis
- Interpretation
- Inference
- Evaluation
- Explanation
- Inductive reasoning
- Deductive reasoning
- Numeracy (quantitative reasoning)



For information about interpreting scores: See [Section 4](#)

If you are currently using a previous form of the CCTST and would like to move to the most recent online version of this instrument, contact your Insight Assessment representative or send us a note at "Contact Us" [insightassessment.com](http://insightassessment.com).

## The Scores and their Descriptions

**CCTST OVERALL:** The OVERALL Score describes overall strength in using reasoning to form reflective judgments about what to believe or what to do. To score well overall, the test taker must excel in the sustained, focused and integrated application of core reasoning skills including analysis, interpretation, inference, evaluation, explanation, induction and deduction. The OVERALL Score predicts the capacity for success in educational or workplace settings which demand reasoned decision-making and thoughtful problem-solving.



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**Percentile:** This score reports the corresponding national percentile score for the benchmark group selected by the test administrator. For example, if the 'STEM undergraduate' percentiles were selected, and the percentile score was '62<sup>nd</sup>', this signifies that the individual scored at the 62<sup>nd</sup> percentile when compared with undergraduate STEM students. Similarly, the mean percentile score in the group report signifies the average national percentile achieved by the group.



**ANALYSIS:** Analytical skills are used to identify assumptions, reasons, themes, and the evidence used in making arguments or offering explanations. Analytical skills enable us to consider all the key elements in any given situation, and to determine how those elements relate to one another. People with strong analytical skills notice important patterns and details. People use analysis to gather the most relevant information from spoken language, documents, signs, charts, graphs, and diagrams.

**INTERPRETATION:** Interpretation is the process of discovering, determining, or assigning meaning. Interpretation skills can be applied to anything, e.g. written messages, charts, diagrams, maps, graphs, memes, and verbal and non-verbal exchanges. People apply their interpretive skills to behaviors, events, and social interactions when deciding what they think something means in a given context.



**INFERENCE:** Inference skills enable us to draw conclusions from reasons, evidence, observations, experiences, or our values and beliefs. Using Inference, we can predict the most likely consequences of the options we may be considering. Inference enables us to see the logical consequences of the assumptions we may be making. Sound inferences rely on accurate information. People with strong inference skills draw logical or highly reliable conclusions using all forms of analogical, probabilistic, empirical, and mathematical reasoning.

**EVALUATION:** Evaluative skills are used to assess the credibility of the claims people make or post, and to assess the quality of the reasoning people display when they make arguments or give explanations. We can also apply our evaluation skills to assess the quality of many other elements that are important for good thinking, such as analyses, interpretations, explanations, inferences, options, opinions, beliefs, hypotheses, proposals, and decisions. People with strong evaluation skills can judge the quality of arguments and the credibility of speakers and writers.

**EXPLANATION:** Explanation is the process of justifying what we have decided to do or what we have decided to believe. People with strong explanation skills provide the evidence, methods, and considerations they actually relied on when making their judgment. Explanations can include our assumptions, reasons, values, and beliefs. Strong explanations enable others to understand and to evaluate our decisions.



The CCTST is created from an item pool that has been researched and greatly expanded over several decades. The continuing performance and relevance of the items, as they are used in a wide variety of calibrated assessment instruments, are maintained by experts in critical thinking, assessment, psychometrics and measurement, statistics, and decision science. All instrument forms are calibrated to the intended population to assure accurate capture of skills scores, accurate capture of gains scores and accurate capture of the population variance. Both internal and independent research provides on-going evidence for the validity and reliability of these measures of critical thinking skills at all levels of educational and occupational expertise.

Currently validated critical thinking skills measures have been tailored to a broad number of population groups, ranging across the K-12 continuum, adult population, college and graduate population and post-graduate high performance samples. Specialized forms of the CCTST use item stems that have the context of the professional workplace targeted by the instrument. To assure that these contexts would be appropriately engaging for test takers, the development of these measures also involved consultation with working professionals in each of the specialized areas.

If you would like to subscribe to a blog on current topics in critical thinking assessment, [follow us on our website](#).

#### The Importance of Critical Thinking

- interpreting new data
- evaluating options
- evaluating results of actions taken
- explaining potential risks
- anticipating complications
- hiring and promoting leaders
- analyzing staffing needs
- developing policy and protocols
- anticipating and preventing errors
- designing new models and processes
- allocating resources
- using and managing information systems
- .....

This list goes on almost indefinitely in high-stakes workplace settings



## The Language of Testing

Insight Assessment takes the global measurement of critical thinking very seriously. We specialize in high quality multilingual assessment tools that are socially and culturally appropriate. We currently serve assessment needs in nearly 70 countries and 25+ languages. Businesses, researchers, health care institutions, governments, military agencies, schools and universities worldwide choose Insight Assessment for our proven assessments and rigorously validated translations.

- Arabic
- Chinese (Simplified)
- Chinese (Traditional)
- Dutch
- English
- French Canadian
- German
- Hebrew
- Indonesian - Bahasa
- Italian
- Japanese
- Korean
- Norwegian
- Portuguese
- Spanish
- Thai
- Turkish
- Vietnamese

To obtain a valid measure of reasoning skills, there should be no language or cultural barrier to understanding the assessment items. Translations of the CCTST are conducted [using a rigorous process](#) that addresses both of these issues. Our online Test-Taker Interface provides independent language flexibility. The test taker can select from a variety of languages on the interface to assure a valid assessment. Navigation and testing instructions are similarly available. Assessing critical thinking in a preferred language removes a concern that the resulting scores are influenced by inadequate language comprehension.

Authorized translations of the CCTST are available in many languages. Each authorized translation is the product of a collaborative effort between the instrument development team and an international scholar who

is usually an in-country native speaker. Many are professional educators and/or researchers. Translations undergo validation studies to assure valid, reliable and culturally available translations. Translation projects are underway which will expand the list seen here.

pensar 想 اعتقد  
 คิด 思う  
 denken synes at  
 tror ajatella berfikir  
 νομίζω חשב  
 düşünmek **THINK**  
 νομίζω pensare  
 думать penser 생각  
 fikir فکر کردن



Check the translations tab at this link to see the [most updated list of available translations](#). If you do not see the language needed, contact us about whether this translation is in process. Translations are made available only when the new items and scales achieve psychometric performance standards.



We are committed to excellence and precision of thinking. Whether you're launching a critical thinking test program in one or more non-English speaking countries or you're planning to assess multilingual individuals here in the USA, Insight Assessment is the high quality choice. Contact us to discuss how our language flexibility will strengthen your multicultural assessment program. [Scholars with interest in a possible translation project should consult the website for additional information.](#)

## Frequently Asked Questions

**1) How many items are on the CCTST assessment?** Depending on the form of the assessment CCTST has 34 - 40 items. All forms of the CCTST provide a statistically comparable measure of OVERALL skill in critical thinking that can be used to benchmark the score against an appropriate national comparison percentile.

**2) Do all forms of the CCTST report individual skills scores?** Yes. The most recent forms have the most extensive and robust list of cognitive skills scores, but even the original forms of the CCTST reported scores for the individual skills identified as core reasoning skills by the APA Delphi study. These are provided to identify areas of strength and areas where growth can occur.



**3) What is the format of the CCTST?** The CCTST is multiple choice format. Items use everyday scenarios, appropriate to the college level student group. No specialized knowledge is required for valid testing, and all information needed to respond correctly to the assessment is provided in the question itself.

**4) What is needed for optimal testing conditions?** The CCTST is cognitively challenging for most individuals. Testing should occur in an environment free of distraction and when the test taker is reasonably rested.

**5) How much time is needed for administration?** The CCTST is administered online in 45 to 55 minutes. The time remaining to complete the test is provided to the test taker, helping them to manage the available time. This time frame is optimal for assessing an individual's critical thinking skills.

**6) Is there a CCTST that can be administered in less than 45 minutes?** No, all valid forms of the CCTST are administered in 45-55 minutes. This is the time needed to assess an individual's critical thinking skills.

**7) How soon are score reports available?** As soon as your test taker completes the online assessment, both individual and group reports are available for download from your administrative dashboard. Insight Assessment staff will orient you to these options and provide you with assistance as needed.

**8) Why doesn't my group statistics PDF score report include the same number of test takers as the spreadsheet?** As explained in [Section 4](#), only tests with at least 60% of the questions answered and with at least 15 minutes time on test are included in the statistical analysis shown in the PDF to prevent mean scores from being negatively and falsely affected by incomplete assessments.

**9) Why doesn't my group statistics PDF score report include descriptive statistics like those in Table 11?** As explained in [Section 4](#), the group must be of at least a minimum size (usually 15 completed assessments) for the statistics package in the report generator to calculate descriptive statistics. For smaller groups, the PDF report will only include the bar charts (histograms).

**10) Can I collect demographic profile data?** Insight Assessment instruments offers the industry's most versatile test administration options. The Insight Assessment online platform offers clients the opportunity to collect demographic profile data for each test taker. This demographic profile is customizable and can be adjusted to fit even the most complicated assessment project needs. Talk with a sales representative about options for your projects.

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**11) Is there an alternative to Online administration?** In keeping with the highest standards in testing services, Insight Assessment offers online administration of all of its assessment instruments. When online administration is not an option for the client setting, Insight Assessment staff is available to consult with you to discover an optimal solution for your project.

**12) When is the testing system available to my test takers?** The testing system is available for testing on a 24-hour basis, seven days a week. This permits maximum flexibility to schedule a testing session at whatever time is optimal, regardless of time zone.

**13) How secure is the Insight Assessment online testing platform?** The testing system is protected by high-level security access and data encryption. See [Section 7](#) of this user manual for additional information about data security.

**14) Does the assessment need to be proctored?** Proctored testing is the standard for assuring that tests are administered as recommended in an appropriate testing environment and completed by the individual who is assigned to take the test. Proctored environments are the expected conditions of administration in all educational settings. This is necessary in high stakes assessment contexts. Testing outside a proctored environment may be appropriate for some projects. Contact us by phone (650-697-5628) or through our website to talk with an assessment specialist about your particular administration needs. See [Section 7](#) for information about client’s responsibility for instrument protection and security.

**15) What happens if the test taker does not complete the assessment?** The test taker is shown the time that remains available for completing the assessment on each item screen to help them manage time wisely. The majority of test takers complete all items in the time provided. An electronic testing session automatically submits a test for scoring at the end of the prescribed testing period, if the test has not already been submitted for scoring.

**16) What is possible in the case of a documented disability?** The testing platform will automatically pick up and apply many accommodation settings that are being used by the client’s browser-based or mobile device. When the accommodation involves extended time on test, contact your Insight Assessment representative to arrange this accommodation for your test taker.

**IF YOU DO NOT SEE THE ANSWER TO YOUR QUESTION:** Contact us by phone (650-697-5628) or through our website to talk with an assessment specialist about particular administration needs.

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**Download free:**

***“Critical Thinking: What It Is  
and Why It Counts”***

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- For students, teachers, and the general public
- An easy-to-read resource describing the importance of critical thinking in all aspects of life
- Available in English, Spanish or Chinese. Find this resource and more on our website:

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[insightassessment.com](http://insightassessment.com)

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## Consider Assessing Both Mindset and Skills

After more than 25 years of assessing critical thinking in students of all ages, and in working adults from all types of workplaces, we have learned that both reasoning skills and a thinking mindset are necessary predictors of success in life and work.

### The APA Delphi Description of the Ideal Critical Thinker

*“The ideal critical thinker is habitually inquisitive, well-informed, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit.”*

### Three different thinking mindset assessments that pair with the CCTST:

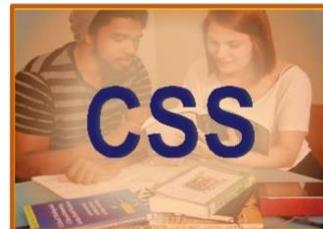


**The California Critical Thinking Disposition Inventory** measures seven mindset attributes globally recognized as characterizing the ideal critical thinker:

**Truth-Seeking \* Open-Mindedness \* Analyticity  
Systematicity \* Confidence in Reasoning \*  
Inquisitiveness  
Maturity of Judgment**

**College Student Success Mindset** measures seven mindset attributes needed for resilience in an educational transition:

**Motivation to Learn \* Drive to Succeed  
Judgment \* Intellectual Integrity \* Foresight  
Resilience \* Creativity**



**Business Attribute Inventory** measures seven personal attributes which are predictive of business performance and success:

**Dependability \* Job Commitment \* Desire to Work  
Honesty \* Desire to Learn \* Desire to Think \* Flexibility  
Tolerance \* Professionalism**

## Section 2: Using CCTST

### Assessing Individuals

**Admissions:** When programs are in high demand and student retention is a factor, adding a measure of critical thinking to the admissions profile assists with identifying candidates who have the skills and the mindset to learn, to persist, and to succeed. Using the national percentile score provides a benchmark for selecting applicants who compare well with the population of students working toward the same degree or credential. Use the OVERALL score, with a preferred range or cut score that is consistent with other students who have done well in the program.



**At your preference, an individual score report can be sent to a designated email address in the admissions office.** The qualitative interpretation of the **OVERALL Score (Superior, Strong, Moderate, Weak, Not Manifested)** is helpful for determining a threshold score that would be desirable for your program. If you are using an accompanying measure of thinking mindset, the desired range of scores is 'positive' or 'strongly positive'.



**Advising:** Direct teaching and learning support resources to the students who are positioned to succeed. Along with writing skills, reading skills and language comprehension, critical thinking is one of the central competencies that must be assessed to help advisors direct students in program and course selection. Individual score reports help advisors see a student's strengths and set specific learning goals for areas where growth is needed.



**Proficiency Testing:** Training resources are scarce and often must be effectively directed only to those who require additional support. A threshold can be set to highlight preferred or acceptable strength in critical thinking for your program or industry. Individuals who fail to achieve that threshold will best benefit from attending training programs aimed at growing critical thinking skills before engaging a challenging curriculum.



**Intern and Student Placement:** Well-designed practice internships are proven methods for a successful professional transition if the candidate has the requisite critical thinking skills to perform in the work environment. A standard can be set as a criterion for the demonstration of readiness to enter internships or workplace environments.

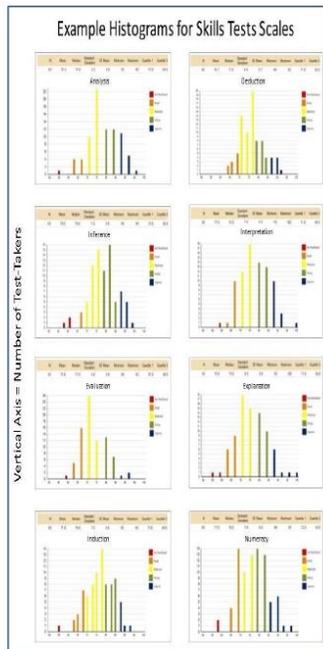
## Assessing Groups

**Quality Enhancement Programs and Learning Outcomes Initiatives:** Continuous improvement in the achievement of student learning is easily tracked with the CCTST, an in-depth assessment that can capture evidence of cohort gains over time in an efficient and economical way.

- Capture exiting students' performance in specific reasoning skills.
- Compare exit cohorts with national comparison benchmarks as a demonstration of the achievement of learning outcomes for performance-based funding.
- Compare entry scores with exit scores to determine the magnitude of improvement in particular programs, schools and colleges.



**Use the report generator in the Insight Assessment testing system to generate an individual group-level report for each of your programs to support faculty working on achieving particular program goals.**



- **Guide curriculum with a new cohort assessment:** Use individual skills scores to identify individual skill areas where the cohort is strong and where there is room for growth: analysis, inference, evaluation, numeracy, inductive and deductive reasoning.

- **Evaluate the quality of programs:** Capture a baseline, then assess subsequent exiting cohorts to evaluate the effectiveness of the new curriculum. Examine scale scores to determine how the new curriculum is impacting students learning.



- **Responding to accreditation guidelines:** Many professional programs base their accreditation on the demonstration of learning outcomes needed by the profession. Critical thinking is a core requirement for most professions. Assess a cohort of students nearing the end of their professional development program and compare their scores for CCTST OVERALL with the national comparison percentiles in that same profession. Scores on the CCTST have been shown to be predictive of successful licensure in many professions, and for this reason it is optimal for the student to make this assessment several months before graduation. This will allow those who score poorly to remediate before sitting for their licensure examination.

## At-a-Glance: Assessment Design Considerations

**Language Comprehension:** This is an important consideration when assessing critical thinking. Students may have difficulty demonstrating their true critical thinking skill if their language comprehension is inadequate to interpret and analyze the question scenario and answer choices. They must understand the question being asked. Visit the “Translations” tab for a specific testing instrument to see its current list of authorized translations.



**Sampling Decisions:** Stake-holder groups often determine how assessment samples must be modeled, sometimes requiring assessment of everyone in your program or organization. In other situations, sampling techniques can be used to determine your sample. Call to talk with one of our assessment experts for more information. Here are two examples of how sampling is used:

- To examine the effects of curriculum change, first capture a representative sample of exiting students to document a baseline for performance under the current curriculum. Then re-assess the next cohort as they exit the program (a ‘posttest only’ design). The assumption here is that successive cohorts are similar in ability when admissions practices have not changed. If admissions practices will also change, add an assessment at admission or program entry to establish the performance level of the new cohort at pretest (a ‘pretest posttest with baseline’ design).
- To analyze student performance at the program level, sample students from each of your specialties (for example, Finance, International Management, Marketing, Entrepreneurship, etc.) at pretest. If there are no differences by specialty, then exit data can be collected with less concern for representation of program specialty.



**Reading Level Considerations:** To perform well on a critical thinking test, the test taker must be able to read the question scenario and answer choices. All college level critical thinking skills tests provided by Insight Assessment are set at a Flesch-Kincaid reading grade level of 8.6 or lower. K-12 versions of the tests have Flesch-Kincaid reading levels well below the grade level of the intended test taker.

**Consider Assessing Both Mindset and Skills:** When your goal is to achieve strong outcomes in your student critical thinking, mindset will be important. We have learned that having strong critical thinking skills is not enough. A strong critical thinker must be willing as well as able to work to achieve goals and to engage and resolve significant problems. They must have the integrity to honestly define problem situations, the habit of taking an organized approach, the inclination to seek out the best possible solutions, the tendency to anticipate the consequences of their judgments, the tolerance to listen to all points of view, and the willingness to reconsider when the evidence points to the need for a new appraisal.

**Motivate People to Give Their Best Effort:** Conditions of testing can have a potential effect on the testing experience, on test-taker effort, and on the quality of the assessment results. Informing test takers of why they have been assigned a testing session and of the importance of providing their best effort on the assessment is often an important consideration. Critical thinking skills assessment can be cognitively demanding and motivation to provide best effort is important. Most people find it enjoyable to complete attitudinal surveys (mindset assessments).



**Providing Individual Score Reports:** Scores on the Insight Assessment instruments are proven indicators of success in workplace transition and professional certification and licensure. Depending on the design and the objectives of your testing program, it may be useful to provide individual score reports to each test taker. The decision of whether to provide assessment results to the test taker is made by the test administrator. Electronic testing options enable the client to provide each test taker an opportunity to view and retain his or her test results. When the project prohibits providing test takers with their assessment results, providing group feedback and information about how testing scores will be used can be helpful.



**Test Anxiety:** Test anxiety is the term commonly used to refer to the anxiety some individuals experience when required to participate in testing situations. For some individuals, fears of under-performance on a test can become reality because of performance anxiety. Information about the assessments, sample questions, and login instructions posted on [InsightAssessment.com](http://InsightAssessment.com) may be useful for managing test anxiety. Test takers who will be completing their assessments online can also prepare for the testing experience by downloading and using our mobile app, “Critical Thinking Insight.” The app offers free access to sample tests.



**Disability Considerations:** The American Disability Act covers the identification of disabilities and the potential need for accommodation of disabled people. When it is determined that accommodations are necessary, these usually include setting up a test condition where the test taker can complete the test in a quiet environment and with extended time accommodation for completion of the test. See also material on ADA accommodation in [Section 7: Customer Relationship](#).

**Securing funding for your Assessment Project:** Insight Assessment provides discount pricing for a number of project types, for example government funded assessment initiatives (US DOE or other State Agency grant, Non-Profit foundations, Government sponsored initiatives or other for peer-reviewed, competitive grant applications). We encourage clients to provide our sales representative with the funding proposal information. A Quote of costs can be prepared that reflects the timing of the award and assures control of project costs. Information about the grant source will be required at purchase. **Insight Assessment also offers academic discount pricing to not-for-profit institutions. Inquire about this and any other discounts that may apply to your assessment project.**

- The Importance of Critical Thinking
- interpreting new data
  - evaluating options
  - evaluating results of actions taken
  - explaining potential risks
  - anticipating complications
  - hiring and promoting leaders
  - analyzing staffing needs
  - developing policy and protocols
  - anticipating and preventing errors
  - designing new models and processes
  - allocating resources
  - using and managing information systems
  - .....
- This list goes on almost indefinitely in high-stakes workplace settings



# Section 3: Online Testing Information

## Use Browser-Based or Mobile Devices

**Administering assessments on a browser-based device:** Insight Assessment test instruments can be administered through both browser-based and mobile devices. It is not possible to test every operating system, so **clients should always verify the app works with their devices** before testing. The browser app should run on any operating system with a modern version (released any time after Summer 2017) of one of these browsers:

- Chrome – modern versions
- Edge – modern versions
- Firefox – modern versions
- Internet Explorer 11
- Opera – modern versions
- Safari – modern versions



**Administering assessments on a mobile device:** **Critical Thinking Insight** is a downloadable app available free at [Apple App Store](#), [Microsoft Store](#), and [Google Play](#). This app-based online test system provides the option of taking our thinking and reasoning assessments on most mobile devices as well as desktop systems.

**You do not need to be a customer to view the testing interface used when you administer this assessment. Download Critical Thinking Insight from your app store:**



### **Benefits of online assessment:**

- **flexibility:** *allowing your test takers to take the assessment on their own devices anytime, anywhere*
- **security:** *our app technology uses the most advanced security procedures to protect the confidentiality of your test takers and your institution*
- **global delivery:** *testing can be done globally 24/7/365 using a multi-language-capable interface*
- **easy access to free sample questions** *that test takers can use to familiarize themselves with the test process*
- **individual and group results** *accessible through our secure client administrator tool*
- **individual report option:** *deliverable at your prerogative to the test taker via email*

**Test takers can log in to complete their assigned assessment using the Critical Thinking Insight app (mobile or browser-based).**



[Contact our Staff](#) for more details.

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## Getting Started

*In a hurry? Your online account can often be established within one business day.  
Our customer support and technology staff will work with you to meet your needs.*

**Previewing the Assessment Instrument:** If you are not familiar with the assessment instrument or the use of our online testing system, a preview of the online system will provide the information you need. Each preview includes one or more opportunities to see the personal profile page, view an example of the assessment(s), and see how (at the client's option) an individual results report can be made immediately available to the test taker.

**Hands-On Administration:** Our testing system is easy to manage and most of our academic customers prefer to schedule their own test assignments and to download their group reports whenever they need them. When you become a client, we will schedule an orientation to your personal online account (client dashboard). During this orientation, staff will assist you to customize your options to provide you with the optimal value for your project. Our staff will answer all of your questions and help you to set up your first test assignment.



Schedule your telephone orientation at least a few days before you plan to begin administering assessments. You will receive an administrative Login and Password that provides continuous access to the online system capabilities. We recommend that your password be updated periodically and given only to individuals who should have access to your administrative account. The system is easy to use, and a step by step guideline is available. In addition, **our staff will remain available to assist if you ever need assistance to download your results reports or set up a new assignment for a new group of test takers.**

Clients have the option of customizing the questions that will be asked in the demographic profile section. Default demographic questions in the profile are: **Name, Email Address, Age, Gender, and Ethnicity**. **These questions can be eliminated at the client's request, and additional questions can be entered by the client to customize the demographic profile.** An optimal demographic profile should take into consideration the burden on the test taker to complete demographic profile questions before beginning the assessment. Any questions added to the profile will be presented to every test taker who does an assessment. Insight Assessment staff are available to consult with clients on this topic at any time as required. **A step-by-step guideline to using the custom demographics feature, with screen shots, is available upon request: 1.650.697.5628.**

Note that the custom demographic profile option is designed only to collect brief answers to short questions that will help you to derive maximum value from your analysis of the final assessment score data. Questions should be limited to a maximum of 85 characters (including spaces). Answers of greater than 220 characters will not be accepted by the online testing system.

**For those who require a Full-Service Option:** When it makes sense to have all of your testing services handled as a part of the purchase agreement, Insight Assessment staff can provide a full-service option where you will not need to personally manage your testing account. Talk to our staff about pricing for customized service.

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## Setting Up an Assessment Session

If you have not been oriented to this procedure, we recommend that you contact your Insight Assessment service representative to be sure that you will be ready to administer your planned assessments.

The process is quick and easy. You will need to set up an assignment (testing session), determine the login and the password your test takers will use to take the assessment, set the dates when the assessment will be available for completion, determine whether your test takers can see their results, and check your previous demographic question selections to be sure that they are what you want to ask this testing group.

Talk with your customer support representative about setting up testing sessions to keep each group of scores separate to allow you to prepare reports and follow groups of students over time.

### Here is a Checklist for Setting up a Testing Session

**Step 1) Login as a Test Administrator:** Access your client dashboard using the client login button located on the Insight Assessment home page: [insightassessment.com](https://insightassessment.com). This can be done anytime, anywhere, via the Internet using your secure administrative Login and Password.



Client Login

**Step 2) Set up the Login and Password for the individuals you plan to assess.** There are two main options to consider in this process. **Option One:** If you are assessing a small number of individuals, or you want to be sure that they complete the assessment only once, you should assign each person a unique User ID and Password with help from your service representative and our technical staff. **Option Two:** As an alternative, if you plan to assess a larger number of individuals in a proctored environment, it may be more convenient to assign an Access Code (universal login) and Password combination that can be used by all of your test takers during that specific testing session. If you use Option Two, the online system will associate a unique identifier with each of your test takers. Each Access Code you create will have a start date and an expiration date. You will be able to extend the expiration date (lengthen the time frame during which the assessment can be completed), if needed. A more complete discussion of these options is included in your system orientation with our staff and in your support materials. **Our staff is also available to assist you. A step-by-step guideline to creating logins and testing assignments, with screen shots, is also available upon request: 1.650.697.5628.**

**Step 3) Add a specific assessment to the testing session assignment:** Using our online customer interface, select the Access Code (Login) and Password you have created in Step 2. Create the test assignment by adding the specific assessment and specifying the time frame during which you want that assignment/those assignment(s) to be available for the individuals you plan to assess.

More than one kind of assessment instrument can be made available for your use in your online account. This usually happens when a client plans to assess several groups of people who are at different educational or job class level within the same educational institution or agency. Whether you have selected only one testing instrument to use or two or more, you can create, edit, or delete assessment assignments as needed. If you have forgotten how to do this, call and work with our staff to correctly set up your assignment or follow the guidelines in the help files you were provided during the orientation to your Test Administrator account.

**Step 4) Check the questions you are currently including in the demographic profile.** Some of the demographic questions are standard in the profile. These can be removed at your request by our technology

staff. You can add up to 10 custom questions to the profile. Changing these questions will affect previously collected reports, so be sure you have downloaded all previous reports before changing the demographic questions. **Contact us for assistance as needed.**

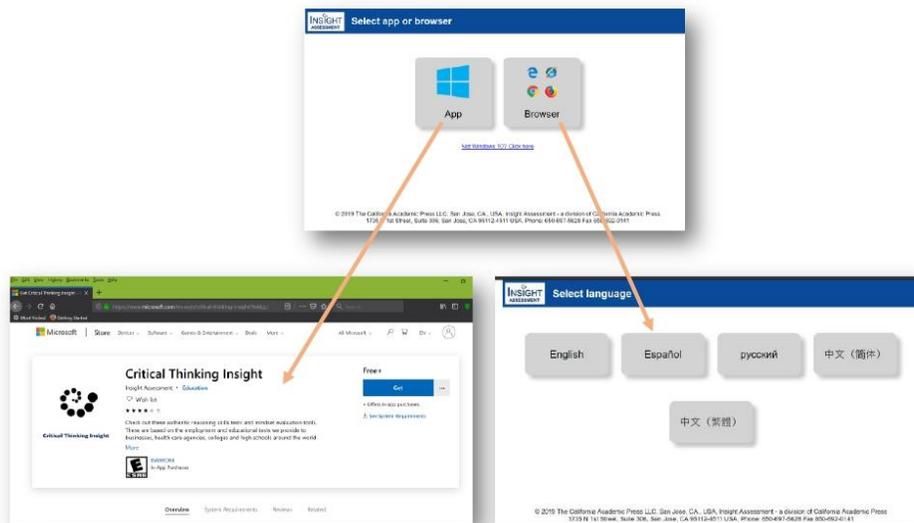
**Step 5) Distribute Instructions for Your Test takers - Usually done just prior to test administration.** Distribute the Access Code and Password information to the individuals you plan to assess. Insight Assessment test instruments can be administered through both browser-based and mobile devices. Do NOT permit test takers to examine, study, copy, review, or otherwise have access to the assignment other than during their online assessment session.

There is no need to instruct the individual on how to use our intelligent online testing system. Simply direct your test takers to the Insight Assessment website:

[insightassessment.com](https://insightassessment.com)

Test Taker Login

When they click the “Test Taker Login” button, the remainder of the process is self-explanatory.



If you select App, you will be connected with your App Store. Get “Critical Thinking Insight” for free.

If you select Browser, you will be invited to choose the language your browser will use to open the testing interface.

However, if you would like to distribute instructions with the assessment assignment, download [Test Taker Instructions here](#). Contact our support staff if you require assistance: 1.650.697.5628

## Proctor Instructions: Online Assessment Administration

Direct the individual being assessed to log in from the Insight Assessment home page:

[insightassessment.com](https://insightassessment.com)

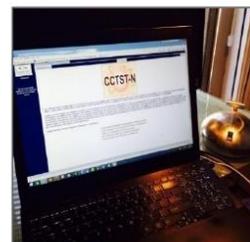
Test Taker Login

1. After the test taker **clicks the “Test Taker Login” button**, the remainder of the login process is self-explanatory using the Access Code and Password which you provide for them.
2. Remind those being assessed to complete and then **“SAVE”** their personal profile. They will be able to download their assessment(s) only after their personal profile is completed and saved. The profile may include some demographic questions if these have been selected for inclusion by your organization or institution.
3. You may provide this information (optional):
  - test questions can be answered in any order, answers can be changed, questions can be skipped
  - a timer will be displayed on every screen to help with time management
  - scroll or swipe as necessary to view the questions and answer choices
  - use of scratch paper on skills tests is encouraged, but will be collected at the end of the assessment period
  - after the test, if you have been permitted to view your results by your test administrator, you will be able to send your own individual score report to an email address of your choice
4. Signal individuals when they may begin completing their assessment.

During the testing period: Maintain an environment where those completing an assessment will not be distracted. It is important that proctors do not respond to questions or comments from individuals regarding any of the assessment items, or those seeking to clarify of any of the assessment items. Proctors should not influence test-taker performance by commenting on the assessment or any of any of its questions.

### Test Center Preparation Suggestion:

If your testing will be conducted in a computer lab or testing center, you can check each computer for readiness by walking through the login process. Begin on the Insight Assessment website ([insightassessment.com](https://insightassessment.com)) and click on the yellow Test taker Login button. Use the login **setup** and the password **etesting**. This action will test the login process for this computer and provide a “Sample View.” The sample view shows a demographic profile and some sample questions (not actual test questions) that provide a preview of the screen view that will be presented by the computer you are checking.



# Section 4: Interpreting Scores



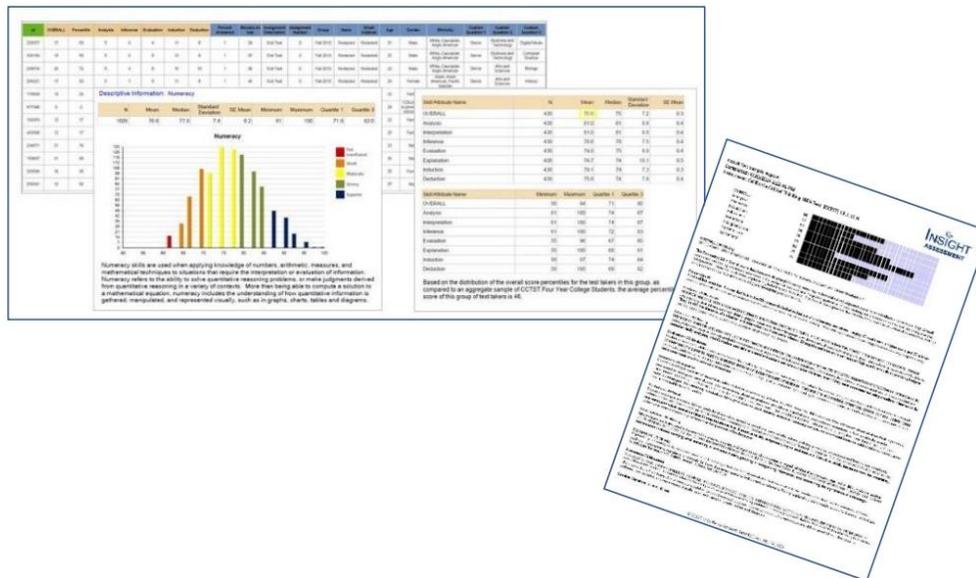
## Downloading Score Reports

Insight Assessment staff will show you how to check in to see whether the test assessments have been completed by your test takers. You can log on at any time and download an individual report or a spreadsheet of your group's assessment scores (all individuals who have completed their test assignment). **A step-by-step guideline on how to use the report generator, with screen shots, is also available upon request: 1.650.697.5628.**

The following sections provide guides to the interpretation of the scores reported for this instrument. Assessment reporting formats include charts, statistical tables, spreadsheets, and individual reports.

Reports of the scores of individuals are presented in spreadsheets showing all scores and demographic responses for each individual in a group, and as PDF files each showing the scale scores for a given individual.

Reports of the scores of groups are presented as PDF files which include statistical tables and bar charts for each scale on the assessment instrument. The following sections describe each of these types of reports and how to interpret the numerical scores and recommended qualitative interpretations of the scores displayed.



## Interpreting Individual Test-Taker Score Reports

**Interpreting an individual's score report is a four-step process:** This process is quite easy. Use the pictured report (Figure 1 on the next page) to see the process in action.

**Step 1: Examine the OVERALL Score and Session Duration.** The OVERALL Score for this example test taker is 82. It is shown on the first page with a brief description of what the OVERALL Score means. This individual completed the assessment in 45 minutes and 32 seconds, adequate time to complete the test. The Session Duration does not include time the test taker may have spent completing individual profile demographic questions prior to beginning the actual test. Critical thinking skills tests completed in less than 15 minutes are considered false scores. See further discussion regarding false scores below.



**Step 2: Examine the comparison percentile.** When a comparison percentile group has been selected by the client, each test taker will also have a percentile score. In this case, the OVERALL Score for this individual has been compared to the Health Sciences Graduate Students percentiles, and it ranks at the 47<sup>th</sup> percentile nationally (shown at the top of the page under the description of the OVERALL Score). Also included is a statement to assist the test taker in understanding the difference between a “percentile” and “percent correct.”

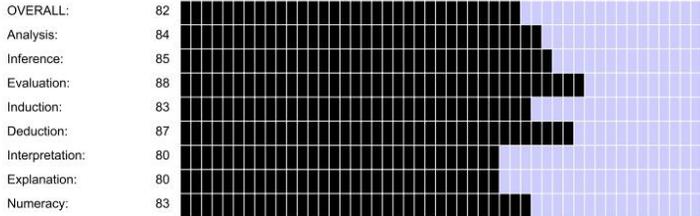
**Step 3: Examine the Qualitative Description of the OVERALL Score.** The performance rating for this individual's OVERALL Score is *Strong*. These recommended ratings are based on peer reviewed and internal studies linking scores to learning readiness, academic program completion and work performance. This is determined by Table 4, using the CCTST 100-point version cut scores. The *Strong* qualitative description of the score is also reported to the test taker (first thing under the graphs).

**Step 4: Examine the Scale Scores.** The newest forms of CCTST provide individual scale scores for **Analysis, Interpretation, Inference, Evaluation, Explanation, Inductive Reasoning, Deductive Reasoning and Numeracy (quantitative reasoning)**. The Scale Scores indicate areas of strength and areas where improvement is needed. The Scale Scores for this individual are presented in both numerical form and as qualitative descriptions. On this test taker's report, the qualitative descriptions of scores for Evaluation and Deduction are *Superior*; the other scores are *Strong*.



*“This applicant’s OVERALL Score was 82, interpretable as STRONG, and at the 47<sup>th</sup> percentile nationally when compared to Health Sciences Graduate Students. Areas of strength include Evaluation and Deductive Reasoning (Superior scores), and Analysis, Interpretation, Inference, Inductive Reasoning, Explanation, and Numeracy (all Strong). These scores reveal a balanced set of critical thinking skills.”*

Result for: Sample Tester  
 Completed: 1/11/2020 12:43:54 AM  
 Instrument: California Critical Thinking Skills Test - 12.1.12 N



**OVERALL: 82 Strong**

**Strong overall critical thinking skill, consistent with the potential for academic success and career development**

The Overall Score describes overall strength in using reasoning to form reflective judgments about what to believe or what to do. To score well overall, the test taker must excel in the sustained, focused and integrated application of core reasoning skills including analysis, interpretation, inference, evaluation, explanation, induction and deduction. The Overall Score predicts the capacity for success in educational or workplace settings which demand reasoned decision making and thoughtful problem solving.

**Percentile: 47**

A note of interpretation: A score that falls in the 60th percentile indicates that out of one hundred test takers, roughly 40 would earn a higher score and 60 a lower score. A percentile score is not an indication of the percent correct, but of relative ranking. Percentile approximations are suggested for advisory purposes only.

**Analysis: 84 Strong**

Analytical skills are used to identify assumptions, reasons, themes, and the evidence used in making arguments or offering explanations. Analytical skills enable us to consider all the key elements in any given situation, and to determine how those elements relate to one another. People with strong analytical skills notice important patterns and details. People use analysis to gather the most relevant information from spoken language, documents, signs, charts, graphs, and diagrams.

**Inference: 85 Strong**

Inference skills enable us to draw conclusions from reasons, evidence, observations, experiences, or our values and beliefs. Using Inference, we can predict the most likely consequences of the options we may be considering. Inference enables us to see the logical consequences of the assumptions we may be making. Sound inferences rely on accurate information. People with strong inference skills draw logical or highly reliable conclusions using all forms of analogical, probabilistic, empirical, and mathematical reasoning.

**Evaluation: 88 Superior**

Evaluative skills are used to assess the credibility of the claims people make or post, and to assess the quality of the reasoning people display when they make arguments or give explanations. We can also apply our evaluation skills to assess the quality of many other elements that are important for good thinking, such as analyses, interpretations, explanations, inferences, options, opinions, beliefs, hypotheses, proposals, and decisions. People with strong evaluation skills can judge the quality of arguments and the credibility of speakers and writers.

**Induction: 83 Strong**

Inductive reasoning relies on estimating likely outcomes. Decision making in contexts of uncertainty relies on inductive reasoning. Inductive decisions can be based on analogies, case studies, prior experience, statistical analyses, simulations, hypotheticals, trusted testimony, and the patterns we may recognize in a set of events, experiences, symptoms or behaviors. Inductive reasoning always leaves open the possibility, however remote, that a highly probable conclusion might be mistaken. Although it does not yield certainty, inductive reasoning can provide a solid basis for confidence in our conclusions and a reasonable basis for action.

**Deduction: 87 Superior**

Deductive reasoning is rigorously logical and clear cut. Deductive skills are used whenever we determine the precise logical consequences of a given set of rules, conditions, beliefs, values, policies, principles, procedures, or terminology. Deductive reasoning is deciding what to believe or what to do in precisely defined contexts that rely on strict rules and logic. Deductive validity results in a conclusion which absolutely cannot be false, if the assumptions or premises from which we started all are true. Deductive validity leaves no room for uncertainty. That is, unless we decide to change the very meanings of our words or the grammar of our language.

**Interpretation: 80 Strong**

Interpretation is the process of discovering, determining, or assigning meaning. Interpretation skills can be applied to anything, e.g. written messages, charts, diagrams, maps, graphs, memes, and verbal and non-verbal exchanges. People apply their interpretive skills to behaviors, events, and social interactions when deciding what they think something means in a given context.

**Explanation: 80 Strong**

Explanation is the process of justifying what we have decided to do or what we have decided to believe. People with strong explanation skills provide the evidence, methods, and considerations they actually relied on when making their judgment. Explanations can include our assumptions, reasons, values, and beliefs. Strong explanations enable others to understand and to evaluate our decisions.

**Numeracy: 83 Strong**

Numeracy refers to the ability to make judgments based on quantitative information in a variety of contexts. People with strong numeracy can describe how quantitative information is gathered, manipulated, and represented textually, verbally, and visually in graphs, charts, tables and diagrams. Numeracy requires all the core critical thinking skills. Numeracy includes being thoughtfully reflective while interpreting the meaning of information expressed in charts, graphs, or text formats, analyzing those elements, drawing accurate inferences from that information, and explaining and evaluating how those conclusions were reached.

**Session Duration: 45 min, 32 sec**

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Figure 1: Sample Individual Test-Taker Report

## Interpreting Group Score Reports

Clients can download score reports in spreadsheet form and an analysis of the group in PDF form. If you are using one of our full-service options, spreadsheet and PDF reports are provided as per your original instructions or upon request. The spreadsheet contains detailed results from each individual in the client group tested, including scores, a client-designed demographic profile, and information about test-taker behavior. Table 1 (below) shows the information from a fictitious example group. Each line of the spreadsheet represents one individual's results.

ID	OVERALL	Percentile	Analysis	Interpretation	Impairment	Education	Registration	Instruction	Directions	Fluency	Unmet Ancestral	Unmet on Test	Assignment Questions	Assignment Points	Name	Local Address	Age	Gender	Ethnicity	Primary Country (Region)	Primary Country (Region)	Primary Country (Region)	Primary Country (Region)
21442	72	30	80	80	75	71	74	77	71	81	1	23	Passes - Fall 2019	7	Patricia	Patricia	21	Female	White, Caucasian, Anglo American	FD	Junior	AK-01	
17582	88	12	74	74	75	83	81	77	88	87	1	23	Passes - Fall 2019	2	Patricia	Patricia	19	Male	Black, African American	YES	Underman	DL	
17517	79	50	80	80	78	84	84	82	77	74	0.85	24	Passes - Fall 2019	2	Patricia	Patricia	18	Female	White, Caucasian, Anglo American	FD	Underman	DL	
17513	71	23	81	81	75	80	81	74	71	81	1	20	Passes - Fall 2019	2	Patricia	Patricia	19	Female	Other	FD	Underman	DL	
22828	71	23	74	74	75	87	81	71	74	74	1	43	Passes - Fall 2019	8	Patricia	Patricia	21	Female	White, Caucasian, Anglo American	YES	Junior	DL	
21488	85	26	81	81	88	80	87	92	79	88	1	44	Passes - Fall 2019	7	Patricia	Patricia	23	Male	White, Caucasian, Anglo American	YES	Underman	DL	
18247	79	50	81	81	83	79	74	82	79	81	1	37	Passes - Fall 2019	3	Patricia	Patricia	27	Female	Black, African American	FD	Underman	DL	
22819	72	30	74	74	78	87	81	74	74	81	1	20	Passes - Fall 2019	9	Patricia	Patricia	20	Male	Black, African American	FD	Underman	DL	
21483	79	50	87	87	80	79	74	82	77	74	0.88	24	Passes - Fall 2019	7	Patricia	Patricia	20	Male	White, Caucasian, Anglo American	FD	Underman	DL	
20188	79	45	80	80	80	79	80	74	79	80	1	20	Passes - Fall 2019	5	Patricia	Patricia	22	Male	Hispanic, Latin American	FD	Junior	DL	
17527	88	12	74	74	72	87	81	74	88	81	1	24	Passes - Fall 2019	2	Patricia	Patricia	21	Female	White, Caucasian, Anglo American	FD	Underman	DL	
20189	79	50	81	81	88	79	81	82	79	74	1	20	Passes - Fall 2019	5	Patricia	Patricia	18	Female	Hispanic, Latin American	YES	Underman	DL	
17874	88	12	84	84	82	92	87	92	88	81	1	43	Passes - Fall 2019	2	Patricia	Patricia	21	Male	White, Caucasian, Anglo American	YES	Senior	PSY	

Table 1: Sample Spreadsheet Group Report

### Spreadsheet: OVERALL and Percentile

Table 2 to the right shows an expanded view of the first three columns of the spreadsheet. The ID numbers reported in the first column (Id) represent the unique identifiers created for that individual test taker by our online testing system. The collection of additional client-specific test-taker identification information in the electronic demographic profile is discussed below.

The second column (OVERALL) is the CCTST OVERALL score. **The CCTST OVERALL Score is the best overall measure of critical thinking skills when the purpose is to compare individuals or groups of individuals.** The OVERALL Score on this family of critical thinking skills tests has been shown to predict success in workplace contexts, the successful completion of educational programs, and passing scores on certification and licensure examinations. CCTST OVERALL scores in this spreadsheet sample range from 62 to 94.

Id	OVERALL	Percentile
836130	77	40
836110	94	95
836135	62	1
834119	85	65
836107	86	70
836144	88	80
834117	91	88
836146	86	70
836114	77	40
836118	88	80
836139	88	80
836125	82	55
836137	85	65
836122	80	50

Table 2: Partial Spreadsheet Report

The third column (Percentile) is the corresponding comparison percentile score. This comparison percentile score corresponds to the CCTST OVERALL score. As previously described, clients can select the comparison percentiles that will be applied. Comparison percentiles permit the comparison of scores to an external criterion, for instance the population of ‘STEM Undergraduate Students’. The comparison group that was selected in this example spreadsheet was the national sample of ‘Graduate Students and Professionals’. The percentile rankings in this sample range from the 1<sup>st</sup> to the 95<sup>th</sup>.

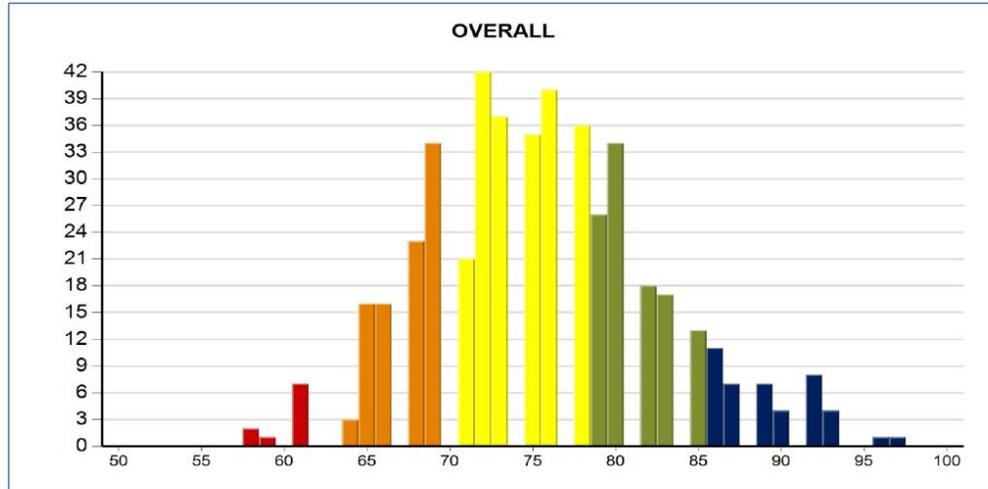


Figure 2: OVERALL Score Distribution

Figure 2 displays a frequency distribution histogram for CCTST OVERALL scores in a sample of undergraduate students. CCTST OVERALL Scores can be interpreted as to their relative strength using qualitative descriptors. In Figure 2, the relative strength of scores is displayed using colors, as described in Table 3 and Table 4.

Description of qualitative ratings derived as a result of research findings	
<b>Superior (Blue Bars):</b>	This result indicates critical thinking skill that is superior to the vast majority of test takers. Skills at the superior level are consistent with high potential for more advanced learning and leadership.
<b>Strong (Green Bars):</b>	This result is consistent with the potential for academic success and career development.
<b>Moderate (Yellow Bars):</b>	This result indicates the potential for skills-related challenges when engaged in reflective problem-solving and reflective decision-making associated with learning or employee development.
<b>Weak (Orange Bars):</b>	This result is predictive of difficulties with educational and employment related demands for reflective problem-solving and reflective decision-making.
<b>Not Manifested (Red Bars):</b>	This result is consistent with possible insufficient test-taker effort, cognitive fatigue, or possible reading or language comprehension issues.

Table 3: Qualitative Descriptions of the Strength of CCTST OVERALL Scores

Score ranges that correspond to the qualitative descriptions are displayed in Table 4 (Below). Use the correct row in Table 4 that corresponds to the form of the CCTST test you have administered.

	Qualitative Description of CCTST OVERALL Score				
	Not Manifested	Weak	Moderate	Strong	Superior
CCTST OVERALL Score (100-point Versions)	50-62	63-69	70-78	79-85	86 or higher
CCTST OVERALL Score (Earlier 34-point Versions)	0-7	8-12	13-18	19-23	24 or higher

Table 4: Qualitative Descriptions of the OVERALL Score

**Example:** A score of 86 and higher for CCTST OVERALL on a 100-point form indicates a **Superior** score. This test taker has demonstrated a skill level **consistent with the high potential for more advanced learning and leadership**.

Superior OVERALL scores are currently earned by approximately 11% of the total population of USA undergraduates at 4-year colleges and universities, by 12% of undergraduate students at globally ranked universities, and by 22% of undergrads at Carnegie Class Research 1 universities (2019). The corresponding score range for 33-pt forms is a score of 24 and higher. Scores in the Superior range have been associated with strong preceptor ratings and work performance. Scores of 69 and lower on 100-pt forms display *weak* overall skill or no manifestation of critical thinking skill, and have been associated with poor performance educationally, in the workplace, and on professional licensure examination.

**The individual's Percentile Score is based on that test taker's CCTST OVERALL Score.** The Percentile Score compares the test taker with the external benchmark comparison group (e.g. a national sample of test takers similar to the group being tested). Within any sample of test takers there is likely to be a wide range of CCTST OVERALL Scores and a wide range of the corresponding percentile rankings. To clarify the meaning of a percentile, if a test taker has a 60<sup>th</sup> percentile score, this means that roughly 59 people out of 100 will score lower than this test taker and 40 persons out of 100 will score higher than this test taker in the national comparison group.

**Interpreting scores using an external benchmark:** If you have set a criterion for a minimum desirable raw score or percentile score for CCTST OVERALL specific to your organization, this score can be bench-marked against an external criterion comparison percentile score. Using Table 2 score data to provide an example: The individual who is ID number 836125 in Table 2 (blue highlight) has a CCTST OVERALL score of 82. This score is at the 55<sup>th</sup> percentile when compared to the selected national comparison group 'Graduate Level Students.' If this graduate school is using a cut-score of 82, they are seeking to admit undergraduate students who demonstrate a level of critical thinking skill that ranks at the 55<sup>th</sup> percentile or higher nationally.

Id	OVERALL	Percentile
836130	77	40
836110	94	95
836135	62	1



Table 5: Subset of Table 2

**Interpreting the Strength of OVERALL Score and the Percentile:** Table 5 shows the first three rows of the larger spreadsheet shown in Table 2. The first row in the table presents a student who completed the CCTST and had an OVERALL score of 77. Using Table 4 we can interpret this as a **Weak** score. This score would place the student at the 40<sup>th</sup> percentile nationally when compared to other students involved in similar programs. The second row is a student with a CCTST OVERALL score of 94 (**Superior**), in the 95<sup>th</sup> percentile of graduate level students. The third row shows a student with a score of 62 (**Not Manifested**) corresponding to the 1<sup>st</sup> percentile nationally when compared to the undergraduate business student population. This score is marked with a rose color in this example, and we will later see that this is a false score.

## Spreadsheet: Scale Scores of Individual Cognitive Skills

Table 6 shows the next eight columns of the spreadsheet report, containing the scores for the eight individual cognitive skills. The strength of each of these scores can be interpreted using Table 7. **The Scale Scores are useful for identifying areas of strength and areas of relative weakness that opportunities for growth that should be addressed in subsequent educational opportunities.**

Analysis	Interpretation	Inference	Evaluation	Explanation	Induction	Deduction	Numeracy
77	72	75	61	91	85	72	67
100	100	100	78	100	91	100	100
78	54	64	58	72	74	52	56
86	78	84	78	86	85	84	75
82	83	88	72	86	88	81	75
100	78	91	72	86	88	84	83
91	83	88	72	91	94	91	83
95	83	94	72	95	91	84	92
86	72	78	67	86	82	72	75
86	78	88	72	91	94	84	83
91	94	94	83	91	88	84	88
82	67	78	72	91	94	69	75
86	67	78	78	77	91	78	75
82	78	75	72	82	85	78	75

Table 6: Scores for the Individual Cognitive Skill Areas on the CCTST

The scales measuring individual cognitive scores (100-point scale forms) have been made more robust and can function as individual indicators when this is required. Investigators should, however, keep in mind that although the specific skill scores reported have internal consistency reliability, test-retest reliability, and strong value as indicators of specific strengths and weaknesses, they are not independent (orthogonal) factors. This reflects their theoretical relationship to the holistic conceptualization of critical thinking as the process of reasoned and reflective judgment, rather than the exercise of discrete cognitive skills. Psychometrically equivalent OVERALL score conversions are available to link various versions of the CCTST. Population comparison percentiles also extend across versions.

 <b>CCTST</b> 100-point Versions	Qualitative Description of Scale Scores				
	Not Manifested	Weak	Moderate	Strong	Superior
<b>Analysis, Interpretation, Inference, Evaluation, Explanation, Induction, Deduction, Numeracy</b>	50-62	63-69	70-78	79-85	86-100

Table 7: CCTST 100-Point Scale Score Interpretation

Table 8 should be used to interpret scale scores for 34-pt versions of CCTST. Unlike the CCTST OVERALL score, the scale scores are not psychometrically equivalent across versions of the CCTST. They have been improved on 100-pt forms of the CCTST. For additional information about interpreting scores, [contact your Insight Assessment representative](#).

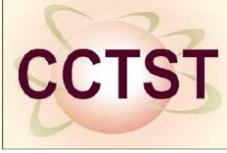
 <b>CCTST</b> 34-point Versions	Qualitative Interpretation of Scale Scores		
	Not Manifested	Moderate	Strong
<b>Analysis</b>	0 - 2	3 - 4	5 or more
<b>Inference</b>	0 - 5	6 - 11	12 or more
<b>Evaluation</b>	0 - 3	4 - 7	8 or more
<b>Induction</b>	0 - 5	6 - 11	12 or more
<b>Deduction</b>	0 - 5	6 - 11	12 or more

Table 8: CCTST 34-Point Scale Score Interpretation

## Spreadsheet: Test-Taker Behavior

The next two columns, with the blue header, indicate the percentage of questions that have been answered ("1" means that 100% of the questions were answered), and the number of minutes that the test taker spent completing the test. See Table 9.

**Examine any available information about test-taker behavior:** When interpreting scores, it is always important to consider the testing conditions. Was the environment conducive to a focused effort? Was adequate time provided for the test taker to complete the assessment? These two columns on the spreadsheet report provide information about test-taker behavior that is useful for determining whether the results represent a true test.

**Percent Answered (response rate):** This column in the spreadsheet reports on the percentage of items answered. In this small sample, all but one of the students answered all of the questions. One student answered 84% of the items. Here the spreadsheet appears in sections for ease of interpretation, but if you were examining these scores using the whole spreadsheet, you would see that this is individual 834117, who scored 91 for CCTST OVERALL (88<sup>th</sup> percentile).

Percent Answered	Minutes on test
1	46
1	44
1	5
1	55
1	51
1	35
0.84	44
1	47
1	21
1	49
1	27
1	31
1	42
1	40

Table 9: Response Rate and Time on Test

Id	OVERALL	Percentile
834117	91	88

Most test takers complete all items on the CCTST in the time allowed, but some individuals either work more slowly or choose to leave one or more items unanswered. This example demonstrates that it is possible to achieve a Superior OVERALL result and a high percentile without answering all of the questions.

*Response rates of less than 0.60 (60% of items completed) are generally considered to be too low to confidently justify the assessment as a true test. This is a rare result and is often an indicator that the assessment was not well fit to the test taker (language comprehension issues, reading ability, or some other confounding variable may possibly be influencing the result).*

Items on the CCTST are challenging and as a result, the most common causes of poor response rates are poor effort, or poor time management.

**Minutes on Test:** A test of critical thinking skills requires time for reflective judgement about which response is correct and which responses involve reasoning errors. The time needed to read the items on the CCTST has been measured at 15 minutes on average. Responding thoughtfully to the items on the CCTST (any form)

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demands more than 15 minutes of cognitive effort. As a result, tests that are submitted in less than 15 minutes are almost certainly false tests. *Less than 15 minutes time on test for the CCTST is a conservative indicator of a false test result.*

The first two test takers in this small sample responded to all questions and submitted their assessment in 46 and 44 minutes time respectively.

Id	OVERALL	Percentile
836135	62	1

In the case of this individual who scored 62 (Not Manifested) at the 1<sup>st</sup> percentile, the time on test of only 5 minutes identifies this as a false test. The report generator in the Insight Assessment testing platform eliminates this result from the sample so that the poor score produced as a result of this false attempt does not negatively influence the mean score for the group.

**Your score reports:** All submitted test attempts are considered test uses, and *the use of any score result is the client's prerogative.* Because there are many circumstances where each test attempt requires documentation, *all test-taker results appear in the spreadsheet report of results.*

## Spreadsheet: Demographic Profile Variables

Table 10 shows a fictitious example of the right side of the CCTST spreadsheet. This section of the spreadsheet includes factors selected by each individual customer. The Assignment Description is whatever name the test administrator created (e.g. Class of 2024 Applicants). The Assignment Number originates in the client's administrative interface and will increase by one each time the client makes a new assignment using the same test.

When setting up their organization's testing account, clients have the option of customizing the questions that will be asked in the demographic profile. The standard demographic questions in the profile are: **Name, Email Address, Age, Gender, and Ethnicity.** **At the preference of the client, some, or all, of the default demographic questions can be eliminated, and questions can be entered by the client to customize the demographic profile.** An optimal demographic profile should take into consideration the burden on the test taker to complete demographic profile questions before beginning the assessment. Any questions added to the profile will be presented to every test taker who starts an assessment. Insight Assessment staff are available to consult with clients on this topic at any time as required.

In the Table 10 example, the standard demographic questions were removed at the prerogative of the client, and seven additional custom questions were added. Custom questions are designed by the client and are best structured so that responses can be made from a pull-down menu of choices. In this fictitious sample of community college students, the client test administrator asked the students to indicate gender, their academic major, their country of citizenship, their year in the program, an identifying number, how they were completing their current coursework, and their current grade point average.

Assignment Description	Assignment Number	Profile Custom Question Response 1	Profile Custom Question Response 2	Profile Custom Question Response 3	Profile Custom Question Response 4	Profile Custom Question Response 5	Profile Custom Question Response 6	Profile Custom Question Response 7
Econ101-2020	5	Male	Accounting	China	1st Year	90012	Online	3.5-4.0
Econ101-2020	5	Male	Accounting	China	1st Year	98843	Online	3.5-4.0
Econ101-2020	5	Male	Business	Australia	1st Year	87845	Classroom	2.5-2.99
Econ101-2020	5	Male	Accounting	Singapore	1st Year	84003	Online	3.0-3.49
Econ101-2020	5	Female	Economics	Singapore	2nd Year	81190	Classroom	3.5-4.0
Econ101-2020	5	Male	Accounting	China	1st Year	90213	Classroom	3.5-4.0
Econ101-2020	5	Female	Accounting	China	1st Year	87332	Online	3.5-4.0
Econ101-2020	5	Male	Business	Singapore	2nd Year	83770	Online	2.5-2.99

Table 10: Demographic Profile Results

## Interpreting Group Statistics



In addition to the spreadsheets that display each test taker's individual scores, your score reports include an analysis of group statistics. This part of the report comes to you in PDF file format. It presents the score distribution for each sample (the group of scores in one testing assignment) as a table of basic statistics.

**Note that your group statistics PDF score report might not include the same number of test takers as the spreadsheet.** As explained above, only tests with at least 60% of the questions answered and with at least 15 minutes time on test are included in the statistical analysis shown in the PDF to prevent mean scores from being negatively and falsely affected by incomplete assessments. **In addition, the group must be of at least a minimum size (usually 15 completed assessments)** for the statistics package in the report generator to calculate descriptive statistics like those in Table 11. For smaller groups, the PDF report will only include the bar charts (histograms) described below. The spreadsheet group report, described above, will always be generated for any group of at least 3 test takers.

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## The Table of Statistics

Included in the results package for hands-on administration is an analysis of the basic statistics describing the score distributions for a group of individuals that completed the same assessment assignment, e.g. a group of test takers from XYZ University all of whom completed the CCTST. Table 11 displays statistical information generated from this group's scores.

Skill/Attribute Name	N	Mean	Median	Standard Deviation	SE Mean
OVERALL	438	75.8	75	7.2	0.3
Analysis	438	81.0	81	8.8	0.4
Interpretation	438	81.0	81	8.8	0.4
Inference	438	78.6	78	7.5	0.4
Evaluation	438	74.0	75	8.9	0.4
Explanation	438	74.7	74	10.1	0.5
Induction	438	79.1	79	7.3	0.3
Deduction	438	75.8	74	7.8	0.4

Skill/Attribute Name	Minimum	Maximum	Quartile 1	Quartile 3
OVERALL	58	94	71	80
Analysis	61	100	74	87
Interpretation	61	100	74	87
Inference	61	100	72	83
Evaluation	55	96	67	80
Explanation	55	100	68	81
Induction	58	97	74	84
Deduction	58	100	69	82

Based on the distribution of the overall score percentiles for the test takers in this group, as compared to an aggregate sample of CCTST Four Year College Students, the average percentile score of this group of test takers is 46.

Table 11: Group Statistics for XYZ University

## Interpret the Group's OVERALL Scores

The group's mean OVERALL Score is the average of the OVERALL Scores for each member of the group tested and the best comprehensive measure of the critical thinking skills of the group as a whole. This number is useful as documentation of the level of achievement of learning goals set for the group as a whole. Examining changes in the mean scores for testing groups over time makes it possible to assess the effectiveness of critical thinking skills staff or student development programs.

This example uses data from the CCTST administered at XYZ University. These are real data, but the identifying information has been redacted. The mean OVERALL Score for XYZ University shown in Table 10 is 75.8. Notice that there are 438 test takers in this sample. We can also see that the OVERALL Scores in the group range from 58 (minimum score) to 94 (maximum score). The 25<sup>th</sup> percentile for this group from XYZ University is 71 (Quartile1) and the 75<sup>th</sup> percentile score is 80 (Quartile 3). These are not externally benchmarked percentiles. They only represent placement within this group of scores.

**National comparison benchmarking:** Each of these 438 students' scores were compared to national comparison percentiles for students enrolled in Four Year Colleges. The mean percentile for the group was

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the 46<sup>th</sup> percentile (see the last sentence in the text below the frequency statistics in Table 11). Each student's national percentile would also appear in the column headed 'Percentile' in the spreadsheet report of scores for the sample. Figure 3 below displays a histogram of the score distribution. How should this group of scores be interpreted? Are the scores adequately strong? Although some test takers in the group are very weak, others are exceptionally strong.

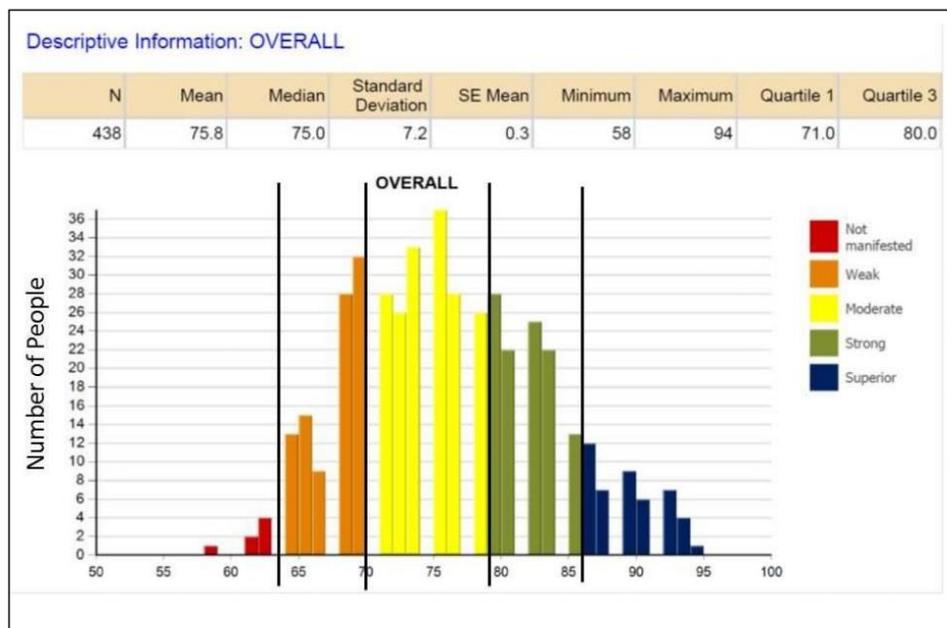


Figure 3: OVERALL Score Distribution for XYZ University

The colored bars in Figure 3 indicate how many of the 438 fall within each of the five qualitative performance levels: red bars indicate that critical thinking skills were **Not Manifested**, orange bars show **Weak** overall skills, yellow bars indicate **Moderate** skills, green show **Strong** skills, and blue indicate **Superior** overall critical thinking skills. Few test takers in this group have scores that are *Not Manifested* or *Weak*. Even though the group, as a whole, scores very near the national mean for its selected benchmark comparison group, there are many scores in the *Strong* range and also scores in the *Superior* range. To complete this analysis of the group of 438, examine the CCTST scale scores to see where this group was particularly weak and where its members were strong.

If you would like to watch a short video explaining histograms and their interpretation: [Visit YouTube to view our video on how to interpret Group Score Histograms.](#)



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## Interpret the Group's Scale Scores

Scale scores are important for identifying areas of strength and weakness. When the group is representative of your program or institution or company, your group scores can give direction to the development of programs to help employees and students improve their critical thinking skills. For example, if the group is relatively weak in one or more skill areas (Analysis, Inference, Evaluation, Inductive, or Deductive Reasoning skills), novel scenarios, case studies, or group problem-solving exercises can be designed to emphasize and practice those skills.

Skill/Attribute Name	N	Mean	Median	Standard Deviation	SE Mean
OVERALL	438	75.8	75	7.2	0.3
Analysis	438	81.0	81	8.8	0.4
Interpretation	438	81.0	81	8.8	0.4
Inference	438	78.6	78	7.5	0.4
Evaluation	438	74.0	75	8.9	0.4
Explanation	438	74.7	74	10.1	0.5
Induction	438	79.1	79	7.3	0.3
Deduction	438	75.8	74	7.8	0.4

Skill/Attribute Name	Minimum	Maximum	Quartile 1	Quartile 3
OVERALL	58	94	71	80
Analysis	61	100	74	87
Interpretation	61	100	74	87
Inference	61	100	72	83
Evaluation	55	96	67	80
Explanation	55	100	68	81
Induction	58	97	74	84
Deduction	58	100	69	82

Based on the distribution of the overall score percentiles for the test takers in this group, as compared to an aggregate sample of CCTST Four Year College Students, the average percentile score of this group of test takers is 46.

Table 12 (Reprinted Table 11): Group Statistics for XYZ University

Using Table 4 to interpret the OVERALL and Table 7 to interpret the Scale Scores and using some color marking to reflect the qualitative ratings, we see that this group has scores ranging across the continuum but has moderate or strong mean scores in all seven of the specific skill areas. Here blue highlighting shows scores in the **Superior** assessment level, green shows **Strong** scores, yellow indicates **Moderate** scores, and red indicates that the score is within the **Not Manifested** range. Looking at the minimum and maximum scores within each skill, we see at least one test taker who does *Not Manifest* that skill and at least one who shows a *Superior* level of that skill. Q1 scores (demarking the bottom 25% of this sample) are all in the *Moderate* range. Q3 scores (demarking the top 25% of this sample) are all in the *Strong* or *Superior* ranges.

An examination of the mean scores shows that half of the sample is strong in Analysis, Interpretation, Inference and Induction, and that there is relative weakness in Evaluation, Explanation, and Deduction. This

general interpretation of the score data is enough to communicate clearly on a general direction for curriculum innovation at XYZ University if the goal is to improve critical thinking learning outcomes.

Scores for each of the scales are presented in histograms separately in the group report. Above each is a bar that describes the basic statistics for the scale scores. The example below, Figure 4, is the Numeracy scale. Numeracy is included in all of the most recent forms of CCTST and the other academic assessment instruments.

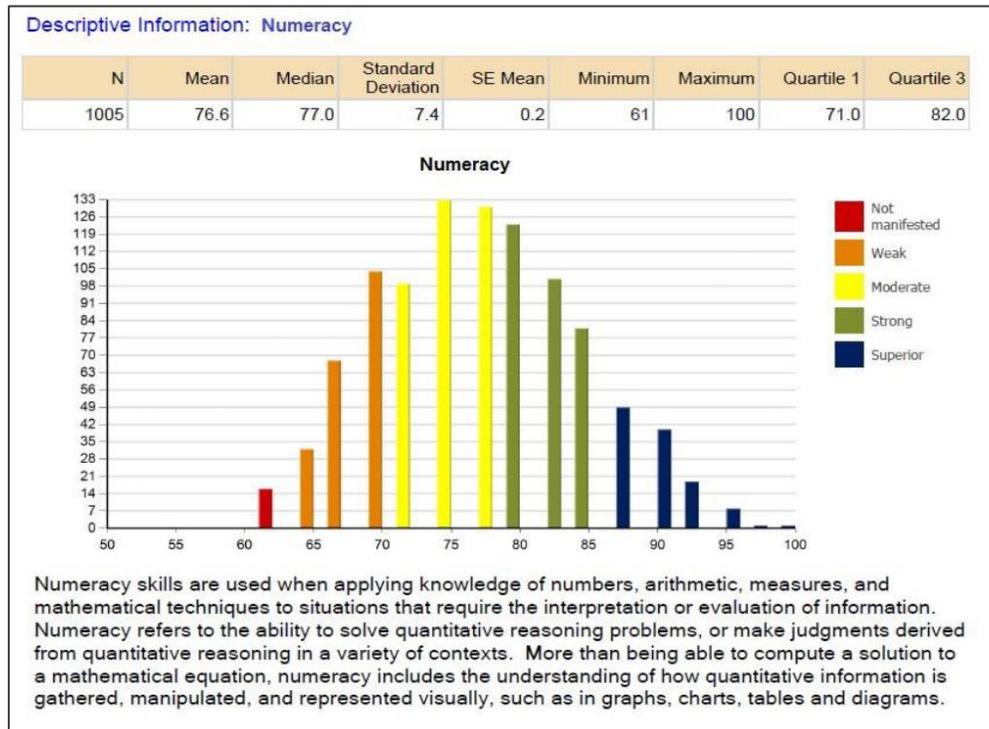


Figure 4: Distribution of Numeracy Scores for ABCD University

By reference to the histogram, one can determine that the group’s mean score of 76.6 falls within the *Moderate* range. The Q1 score of 71 implies that the top 75% of this group of 1005 test takers score in the *Moderate* range or higher. The Q3 score of 82 indicates that at least the top 25% score in the *Strong* or *Superior* ranges. By adding the number of test takers as indicated along the left axis for the orange and red bars, we can determine that roughly 200 of these 1005 individuals have weak numeracy skills or were not able to manifest their numeracy skills. Low scores for numeracy in this sample identify it as an area for improvement, possibly through focused training.

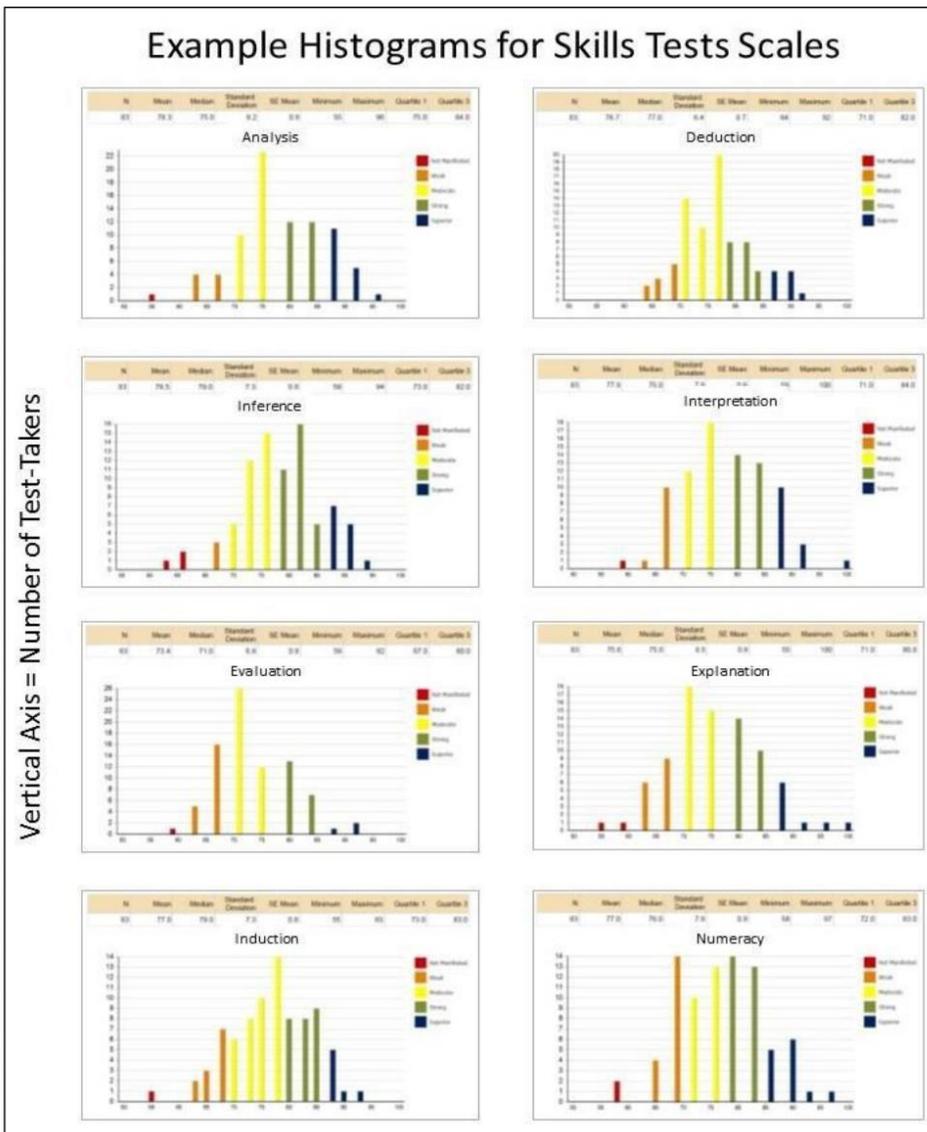


Figure 5: Distributions of Scale Scores for QRST University

CCTST group reports provide distribution graphics describing the sample in eight skill areas: Analysis, Interpretation, Inference, Evaluation, Explanation, Induction, Deduction and Numeracy. Figure 5 shows an example of these individual histograms in a sample of undergraduate students. These graphics display the relative strength of scores in each of the scale areas.

## Use the Insight Assessment Report Generator Online

The statistical table group report, the group histograms, and the spreadsheet of individual scores can be created and downloaded by customers using our online system. All completed tests in the selected data set which have at least 60% of the questions answered and at least 15 minutes time on test are included in the group statistics analysis. Mean scores are negatively and falsely affected by incomplete assessments.

In addition, the group must be of at least a minimum size (usually 15 completed assessments) for the statistics package in the report generator to calculate descriptive statistics like those in Table 11. For smaller groups, the PDF report will only include the bar charts (histograms).

Spreadsheet reports, however, do include all individual test results, regardless of time on test or percent answered. Additional discussion regarding the handling of false test attempts is included below. **A step-by-step guideline on how to use the report generator to produce reports and to aggregate and disaggregate data, with screen shots, is also available upon request: 1.650.697.5628.**

## Important Considerations When Analyzing Score Reports

### Difference Scores, Gains, and Discarding False Tests

When we talk about critical thinking, we are discussing a holistic human reasoning process which results in a singular judgment about what to believe or what to do. Like safe driving, a person can't just be proficient at the gas pedal skills, and we cannot evaluate gas pedal skills without considering how those skills go into the whole process of safe driving. The two-thousand-year-old traditional delineation of reasoning skills, which divides them into deductive or inductive, cross cuts the APA Delphi Report's list of core critical thinking skills. This means that any given inference or analysis or interpretation, for example, might be classified as deductive or as inductive, depending upon how the theoretician conceives of these more traditional categories. Conceptually, the skills in the Delphi list are not discrete cognitive functions either. In actual practice they are used in combination during the process of forming a reasoned judgment. Although in some contexts a given skill can be considered foremost, other skills are also being used. As a result, although the specific skill scores reported have internal consistency reliability, test-retest reliability, and strong value as indicators of specific strengths and weaknesses, they are not conceptually independent factors. This is consistent with the *holistic conceptualization of critical thinking as the process of reasoned and reflective judgment*, rather than simply a list of discrete skills.

**Educationally Significant Gains in Group Mean Scores:** A score improvement of even one point for a given individual signifies that this individual correctly analyzed a scenario and identified the correct response while not falling victim to other common reasoning errors presented in other response choices. In group data, some individuals will demonstrate larger gains as the result of an educational program and others may demonstrate no improvement. See additional comments below in "Difference Scores".

As a result, a mean score improvement for the group of one point from pretest to posttest is indicative of educationally significant improvement for the group. Larger samples will deliver a statistically significant result ( $p < .05$ ) with this degree of gain, but the statistically significant result will not reach the  $p < .05$  level and

beyond until the gain is approximately 2 in smaller samples. This is appropriate to the test of significance which assumes representation of the sample and requires a larger effect before judging the apparent gain to be other than chance.

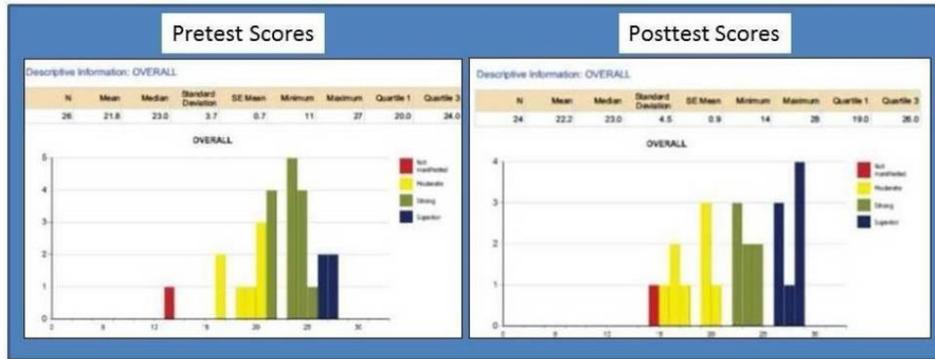


Figure 6: Pretest and Posttest OVERALL Scores Comparison

In general, a 1.0 point improvement in the group mean signifies that *on average* everyone in the group no longer made at least one of the common reasoning errors that result in a flawed problem analysis, inference, decision, and/or evaluation. This is true whether the people in the sample are the same people or consecutive cohorts. The CCTST family of assessments, in all its various versions, is designed to expose common human reasoning errors, and to improve scores an individual must avoid all likely pitfalls for a given scenario. Raising a group by a point is not educationally trivial, although it often takes a reasonably sized sample to demonstrate this in a statistical test.

**Individual Difference Scores:** A gain in a group mean score is typically described as educationally significant for the group overall, although it likely represents very significant gains for many individuals within the group and lesser gains or no gains for others. Often a better analysis of the group can be obtained with an analysis of difference scores. This is a particularly useful analysis when the sample is small.

When the same individuals have taken the assessment at two time points (before and after a treatment designed to train critical thinking skills), one can measure gains by examining individual difference scores for each individual. ( $T_2 - T_1$  where the “T” stands for “Time”). Gains can be easily seen as positive values for ‘X’ in the equation (Score at Time2 minus Score at Time1 = X). Negative values are also possible and, if they are true scores, require equal attention.

Individual difference scores are the most informative of the effectiveness of training techniques. Large individual difference scores are observed in most pretest posttest studies for at least some individuals. Figure 7 below is an example of a graph of difference scores representing 130 individuals all of whom were tested twice. In this case most individuals showed gains of 1 or more points.

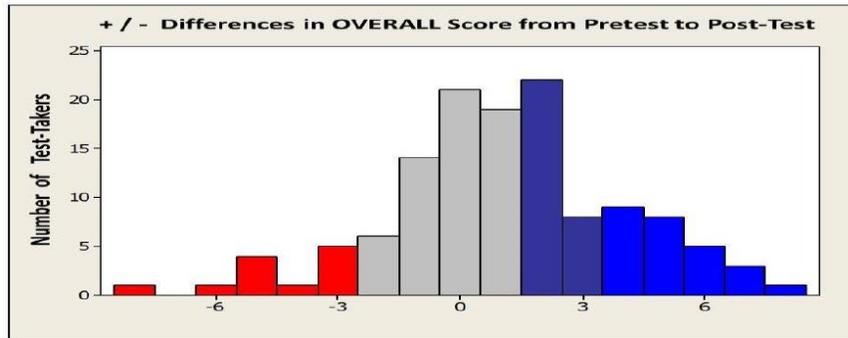


Figure 7: Difference Scores Comparing Pretest with Posttest Scores

Increases in OVERALL Scores of 2 or more points (darker blue) are typically statistically significant. They indicate the effectiveness of training programs. Gains of 4 or more points (brighter blue) are exceptional. Individual difference scores are the most informative data for analyzing an educational or training program's impact on individual trainee critical thinking skills or mindset.

Losses in scores of 3 or more points are not expected. True scores (or percentiles) that drop significantly at posttest are very rare, as critical thinking skills are not lost over a short period of time in the absence of cognitive injury or chemical impairment. More commonly they are false scores. These are most commonly the result of a failure to give or to be able to give best effort. Other reported information about the data (less than 15 minutes time on test at posttest or cases where fewer than .60 (60%) of items were completed at posttest, (both indicative of poor effort at posttest) may explain reduced scores at posttest.

**Gains in Relationship to Sample Size:** An adequate sample size is an important factor in any research that includes a statistical test to assess the effectiveness of a training technique or to study the significant effects of any other environmental factor on critical thinking skills or mindset. Intensive training programs focused primarily on critical thinking could reasonably expect a large or a moderate effect size. In the sample below (Figure 8) the training program produced large gains in a significant proportion of the sample. Three scores dropped at posttest, pulling down the mean score for the group but a significant number of post test scores demonstrated a large effect.

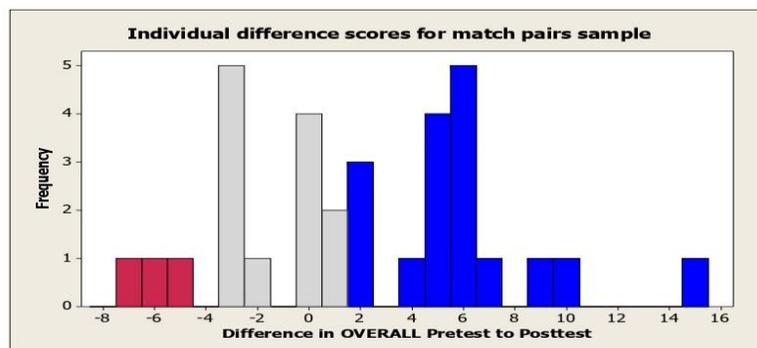


Figure 8: Demonstrating Gains in a Matched-Pairs Sample

When the strength of the training program is unknown, it is advisable to plan sample size to capture even small effect sizes. The standard power analysis techniques used by the investigator to estimate the needed sample size in all well-designed research will provide guidance as to the sample needed to test the effectiveness of the training intervention.

**Sample Representativeness for Report to Stakeholder Agencies:** We recommend caution when attempting to generalize from small sample results to assumptions about the population as a whole, unless the sample of test takers is representative of the larger population. This is particularly important when the purpose of assessment is to report program outcomes to stakeholders. For example, the test results from a sample of 200 students, all of whom have volunteered to be tested, may not be representative of the larger population of students. Larger samples are usually needed if the intention is to model the campus population of students across programs.

**Independent vs. Matched-pairs Comparison:** Assuring each individual is tested twice can be difficult, so often it is necessary to assess one representative sample at pretest (Time1) and a different representative sample from the same group at posttest (Time2). Some individuals may be assessed at both times, but there will likely be many people in the samples who were assessed only once (only at Time1 or only at Time2). This is a very common situation when the group being assessed is a large sample (university-wide student sample, company-wide employee sample, agency-wide community sample). If the group is representative of the larger population being studied, one can assume that any gain made by the sample from Time1 to Time2 is true of the population at large.

**Very Low Scores and False Scores:** Low scores should initially be regarded as true tests. Very low scores in an entry cohort should be examined as they may identify students at risk in an entry cohort. Very low scores in an exit cohort are more likely to be false tests because they correspond to scores that are not indicative of college level performance. Two indicators of likely false tests include inadequate time on test and inadequate response rate. Spreadsheets downloaded from the online testing system provide information about time on test and the ratio of items completed. Results where time on test is less than 15 minutes or where the ratio of items completed is less than .60 should be examined as possible false tests. These cases are very rare in most datasets. If they are prevalent in your dataset, consult with Insight Assessment staff to assure that you have selected an appropriate form of the test for your test-taker group. We consistently see at least 95% of college test takers respond to 100% of the questions on the CCTST family of tests. A 60% response rate is regarded as a minimum psychometric criterion for a true test. Reading the critical thinking skills test items typically takes about 15 minutes (allowing no time for reflection and response), and for this reason, this time frame is set as a minimum guideline for determining whether a critical thinking skills assessment is a true test. Most test takers will require at least 28 minutes when completing a critical thinking skills assessment. Tests of mindset attributes can be completed in less time. The minimum time requirement for consideration of a thinking mindset assessment as a true test is 5 minutes. Most test takers will require at least 14 minutes to complete a mindset assessment and many will require the entire time allowed.

Other possible reasons why scores may be falsely low include illness, fatigue, language proficiency problems (contact Insight Assessment for authorized translations of the test) or distractions in the testing center.

# Section 5: Validity & Reliability



*The information in this section regarding instrument validity and reliability applies to all the reasoning skills instruments offered by Insight Assessment, which currently includes the INSIGHT Series of assessments for Defense, Business, Health, First Responder, Educator, and Law, as well as our academic series of assessment instruments (CCTST, BCTST, HSRT, TER, BRT, CCT-G835, STEM, Quant-Q, EDUCATE INSIGHT for K-12, and the skills sections of two-part tests in LSRP, CSS, and MDCTI). This information applies as well to the related attribute measures focusing on mindset metrics included in the INSIGHT Series and in the academic assessments LSRP, CSRS, MDCTI and EDUCATE INSIGHT (K-12), as well as the independently available CCTDI, CSM, BAI, and CM3. Because the skills test questions and attribute measure prompts for all of these instruments are drawn from extensive item pools which have been developed and validated through decades of testing, we reference our instrument validation process generically.*

This section provides important information relating to the validity and reliability of Insight Assessment's instruments. Major topics include content, construct, criterion (predictive) validity, internal consistency, and test-retest reliability. Included are hyperlinks to published research reports about the validity and reliability of the instruments.

## Validity

**At Insight Assessment we take the measurement of reasoning skills and mindset very seriously.** Our products measuring reasoning skills and mindset have been studied in a variety of populations and contexts over the past 25 years. In each case, items/scales are piloted in target samples and validated in replicated studies (undergraduate students, graduate students, employees and trainees, military officers and enlisted personnel, government employees, children at every K-12 grade level, health professionals across the spectrum of health care disciplines, law students, MBA students, technical and community college students, and the general population) to assure the performance of the assessments in the intended population. Likert style items that measure mindset are grouped in scales with demonstrated validity and reliability and are tested against social desirability bias and cultural bias. Multiple choice items that measure reasoning skills are the result of an item pool tested over a 40-year period to define item difficulty and scale membership. Built on a growing science of the measurement of human decision-making, each instrument has been psychometrically evaluated in collaboration with researchers, educators, trainers, and working professionals, to assure cultural and language competence in the intended test-taker group. Validity and reliability coefficients meet the highest standards for all instruments.

Measurement science provides clear evidence that higher-order cognitive skills, such as critical thinking, can be measured validly and reliably by well-crafted multiple-choice items. Insight Assessment's researcher led instrument development program, which began in the 1970s, has demonstrated instrument performance. Our customers rely on this quality in hundreds of independent research studies carried out by researchers and educators throughout the world.

The lead researchers and test developers gratefully acknowledge our many international colleagues who have worked to establish the validity and reliability of the translated instruments, our many health care, business, law, and military professionals who advised on the production of discipline tailored measures and the INSIGHT professional line, and the additional validation work in reading comprehension done by Dr. Joanne Carter Wells of California State University Fullerton, and the psychometric consultation and focus on numeracy contributed by Dr. Carol Gittens of Santa Clara University.

**Content Validity:** Content Validity refers to the ability of a test to capture a measure of the intended domain. Identification of the pertinent domain, and obtaining agreement on it, are of primary importance to content validation.<sup>2</sup>

<sup>2</sup> Cronbach, Lee, *Essentials of Psychological Testing*, Harper & Row 1990.

A second criterion of content validity is assuring that “sensible” methods of test construction are employed.<sup>3</sup> The specified domain is critical thinking as defined by the Delphi group and subsequently endorsed by populations globally, is discussed in Sections 1 and 5. Critical thinking, as defined by the APA Delphi study,<sup>4</sup> is a construct which integrates a number of cognitive maneuvers known to be a component of this type of human reasoning process. These maneuvers are included in the APA Delphi study report as embedded concepts. Analysis, inference, and evaluation are examples. Each of our skills assessments is designed as a holistic measure of the construct Critical Thinking, with embedded scales that can be used to examine the embedded concepts as well.

The content validity of each of the skills measures is further supported by educators in the field of human reasoning, researchers and doctoral dissertation scholars studying human reasoning skills, and human resources professionals seeking to hire employees with strong decision skills, who adopt these assessments. Validity of measurement also requires that the testing instrument must be free of unintended distractors that influence the response choice of groups of test takers and be calibrated to the intended test-taker group. Test administrators are cautioned to assure that these measures match the educational and reading level of the planned test-taker group.

In all critical thinking skills assessments provided by Insight Assessment, test takers are challenged to form reasoned judgments based on a short scenario presented in the question stem. The critical thinking skills assessments do NOT test any content area knowledge. Skills questions are framed in the context of everyday concerns and use the context of the working or educational community being assessed. This improves test engagement. All necessary information needed to answer the question correctly is presented in the question stem. The fact that the skills assessments measure only critical thinking and not content knowledge makes it possible to use these instruments as a pretest and posttest to measure improvement in critical thinking that occurs during any educational program or staff development exercise. For a valid measure of critical thinking, the instrument must present the appropriate range of difficulty for the individual or group being tested to allow the accurate scaling of the score. The critical thinking skills assessments provided by Insight Assessment are calibrated to the intended population. Contact Insight Assessment for information and consultation about choices of assessments that will be appropriate for your assessment project.

**Language Translations:** When an instrument is translated to other languages, methods to maintain the validity of items and scales is an integral concern. Variations in culture have required that some items be changed in the non-English language translations due to idiomatic or cultural interpretation issues, so the various language versions are not completely identical at the item level. However, much care has been taken, through collaborations with international scholars who are native language speakers, and using rigorous iterative translation procedures to assure validity, reliability and cultural competence is achieved in all authorized translations.

**Construct Validity:** Evidence for the construct validity of the skills portion of the assessments is demonstrated by independent research reports of gains in skills scores after participation in a course or training program aimed at building critical thinking skills. Some of these peer-reviewed publications written by researchers from countries around the world, are posted as examples of how the skills assessments provided by Insight Assessment have been used to [document gains in critical thinking skills](#).



For this to occur, any improvement in scores must be attributable to improvements in critical thinking and not to some other external factor. In other words, as possible, all variables are held constant with one exception: a treatment is supplied which is expected to increase critical thinking skills. This might be, for example, a staff development program focused on case-based analysis of real problems when the emphasis is on training critical thinking skills, a course in critical thinking that practices students or working professionals in the use of their critical thinking skills, a class or internship focused on training reasoning skills, or some other such treatment. Then, it would be reasonable to expect that improved posttest scores for the same individual or group could be attributed to the effects of the intervention to build critical thinking skills. To maximize quality in the testing condition, consultations with technical staff from Insight

<sup>3</sup> Nunnally, Jum C., *Psychometric Theory*, McGraw-Hill 1978

<sup>4</sup> The American Philosophical Association. (1990) *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction*, ("The Delphi Report"). ERIC Doc. No. ED 315-423.

Assessment on testing plan design are made available as a part of the new client package when clients are beginning new testing programs.

Construct Validity is also demonstrated by correlational studies where critical thinking scores are correlated with other measures that purport to include the construct. The critical thinking skills portion of these assessments have demonstrated strong correlations with other instruments that purport to include a measure of critical thinking or higher-order reasoning as a component of their scores or ratings. High correlations with standardized tests of college-level preparedness in higher-order reasoning have been demonstrated (GRE Total Score: Pearson  $r = .719$ ,  $p < .001$ ; GRE Analytic  $r = .708$ ,  $p < .001$ ; GRE Verbal  $r = .716$ ,  $p < .001$ ; GRE Quantitative,  $r = .582$ ,  $p < .001$ ). These correlations indicate the degree to which these more broadly focused instrument capture an assessment of critical thinking. A number of these relationships were reported in a large multi-site research study involving 50 programs of health science education assessing students' critical thinking.<sup>5</sup>

**Comment - Critical Thinking and Grade Point Average:** Many academic settings examine the relationship between scores on the skills portion of an assessment and course grades given by the faculty in an educational program. Critical thinking skills scores can easily be analyzed in relationship to GPA and many authors have reported this relationship to range from .20 to .76 depending on how much critical thinking skills are being rewarded in the course grades. Stronger correlations are typically reported by STEM educators and by health science educators. Many considerations go into the assignment of grades, including an assessment of learned content knowledge, effort, work product produced, and participation. These confound the contribution that critical thinking may or may not be making to an assigned course grade. Typically, there is less variance in GPA variable rendering it less informative. Other types of [ratings made by trainers](#), using [rating tools](#), often are more informative of how critical thinking skills are being assessed at the classroom level. **Comment - Age and Critical Thinking:** Age is not a significant predictor of critical thinking ability in adults when educational level is controlled and when the sample is drawn from those involved in the workplace or in educational training programs. Not much is known about critical thinking skills in the general population. Children of all ages demonstrate varying ability in critical thinking. The measurement tool must be calibrated to age (grade level) for all but high performance samples in the [K-12 population](#). **Comment – Sex and Critical Thinking:** There is no significant difference in scores between males and females in critical thinking skills tests distributed by Insight Assessment. This has been demonstrated in hundreds of thousands of test administrations in all types of population groups. When differences have been observed in small samples, the proportion of males and females in the sample is typically skewed due to some selection effect. **Comment – Educational Opportunity and Critical Thinking:** Significant relationships have been noted at initial testing (pretest or Time1 testing), with somewhat lower scores on average being observed in individuals who have had less educational opportunity, but research has demonstrated that individuals can manifest evidence of strong critical thinking skills in the absence of formal educational programs (college degrees or training certifications).

**Criterion (Predictive) Validity:** Criterion Validity is the most important consideration in the validity of a test. Criterion validity refers to the ability of the test to predict some criterion behavior external to the test itself.<sup>6</sup> For example, the validity of a cognitive test for job performance is the demonstrated relationship between test scores and supervisor performance ratings. For instance, one might want to know whether scores on a measure of critical thinking skills were predictive of some meaningful measure demonstrating the achievement of designated learning outcomes or the successful preparation and licensure of key professionals in society, or the successful transition to the workplace. Our clients have report criterion validity for the metrics included in INSIGHT Instruments related to workplace decision-making performance, and the demonstration of mindset attributes such as dependability, commitment, flexibility, and honesty. Independent research studies of skills instruments used for professional education programs (CCTST, HSRT, BCTST, and TER) have all been demonstrated to be predictive of professional board licensure, certification, program completion, and successful transition to the workplace.

Criterion Validity has been demonstrated by these assessment instruments as they are cited in a large and growing literature, reflecting findings in both the United States and other nations around the world. Many of these studies have been completed with authorized culturally sensitive translations of the assessments created with the collaborative

<sup>5</sup> Facione and Facione. Critical Thinking Assessment in Nursing Education Programs: An Aggregate Data Analysis. Millbrae, CA: California Academic Press, 1997.

<sup>6</sup> Nunnally, JC and Bernstein, IH. Psychometric Theory. McGraw Hill, New York.

assistance of international scholars. Independent research projects using Insight Assessment instruments have been funded by the USA NSF, DoD, NCI, CDC, DoE, by government funding from China, Singapore, South Korea, Thailand, Canada, Australia, South Africa, and many nations in the EU. **Independent, peer reviewed research providing evidence of predictive validity of these Insight Assessment skills assessments can be found on the following links:** [published independent research documenting the criterion \(predictive\) validity](#) with performance ratings, studies that use various assessments [to evaluate training techniques](#), to examine [the achievement of learning outcomes](#), and [to study leadership decision-making](#). Included in this research are doctoral dissertation studies examining critical thinking in relationship to disciplinary training in a wide variety of disciplines.

## Reliability



**Internal Consistency Reliability (KR-20, Cronbach's Alpha): For all measures of critical thinking skills, the discussion of the Kuder Richardson statistic applies.** The appropriate internal consistency reliability coefficient for the reasoning skills instruments is the Kuder-Richardson test because scoring for these instruments is dichotomous. However, this coefficient is known to *underestimate* the actual reliability of the instrument when there are fewer than 50 items and when the construct being measured is not highly homogenous. For these reasons, KR-20's of .70 are deemed evidence of strong internal consistency in non-homogenous measures. This level of internal consistency is the standard used for development of Insight Assessment critical thinking skills instruments. The OVERALL Scores of all versions of the reasoning skills tests meet or exceed this .70 criterion in the validation samples, and in large model population samples. KR statistics in this range are typically observed in independent samples when the sample size and variance is adequate. Factor loadings for items range from .300 to .770. The traditional delineation of reasoning into deductive or inductive cross cuts the APA Delphi Report's list of core critical thinking skills. This means that any given inference or analysis or interpretation, for example, might be classified as deductive or as inductive, depending upon how the theoretician conceives of these more traditional and somewhat contested categories. Conceptually the skills in the Delphi list are not necessarily discrete cognitive functions either, but in actual practice are used in combination during the process of forming a reasoned judgment, that is critical thinking. Although, in some contexts a given skill can be considered foremost, even though other skills are also being used. For example, a given test question may call heavily upon a test taker's numeracy skills, while at the same time requiring the correct application of the person's analytical and interpretive skills. For these reasons, and others relating to test design and cognitive endurance, the items on the skills assessments in all their various versions, may or may not be used on more than one scale. As a result, although the specific skill scores (scales scores) reported for each of the assessments have internal consistency reliability, test-retest reliability, and strong value as indicators of specific strengths and weaknesses. But they are not independent factors. One cannot assess the cognitive skills of analysis without some requirement for interpretation, for instance. This is theoretically appropriate to the *holistic conceptualization of critical thinking as the process of reasoned and reflective judgment*, rather than simply a list of discrete skills.

**For all measure of critical thinking mindset, the Cronbach's Alpha statistic applies.** Cronbach's Alpha is the appropriate internal consistency coefficient for all measures of critical thinking and leadership mindset dispositional elements because scoring for these instruments is in Likert Format. Assessment instruments sold by Insight Assessment meet the threshold for strong internal consistency reliability (a minimum Alpha of 0.80) and are observed to maintain this performance in all samples of adequate variance. Internal consistency reliability for the individual scales included in any of the mindset measures range from .71 to .80, with the alpha for the overall instrument. When it is theoretically appropriate to combine the scales into an overall measure of critical thinking mindset (as in the case of the CCTDI) this value typically exceeds .91. Strong values have been observed consistently in independent samples collected over the past 25 years in various language translations, ranging from .60 to .78 on the scales and .90 or above for the overall measure. Lower reliability coefficients are observed in samples where the variance of scores is not large. Occasionally a customer may require a calculation of the internal consistency reliability coefficient for their own sample. This is sometimes the case in research studies where the population being measured is atypical in some respect. When the sample size is adequate to support the analysis (at least several hundred participants are advised), clients may request a custom analysis of the appropriate internal consistency statistic for their study sample. Additional fees apply.

**Test-Retest Reliability:** Test retest reliability for all instruments distributed by Insight Assessment meets or exceeds .80 in samples with adequate variance, retested at two weeks post pretest. Many samples demonstrate no change after

far longer intervals when no active training in critical thinking has occurred between pretest and posttest. This is true for both measure of reasoning skills and mindset. No statistical evidence of an instrument effect has been observed for any instrument in internal studies of test retest reliability. We have observed that measures of critical thinking skills and mindset are very stable over time when there is no history of training in critical thinking. Test retest coefficients for both mindset and skills instruments are typically observed to meet or exceed .80 when the Time-2 administration is given two weeks after the Time-1 administration in samples, and after as long as three years after pretest where there is no on-going educational program.

## Published Evidence of Validity and Reliability

If you are reading this User Manual as an electronic file, the following links will lead you to our website listing of [published independent research documenting the criterion \(predictive\) validity of the skills assessments](#), studies that use [the assessments to evaluate training techniques](#), to examine [the achievement of learning outcomes](#), and [to study leadership decision-making](#). If you are reading in hard copy, visit our website through your browser or mobile device and select the "Resources" tab. This area of the site provides you with many teaching and learning materials for classroom and training program development and also abstracts of peer reviewed publications describing studies that [evaluate training techniques](#), studies reporting on [learning outcomes assessment](#), studies linking critical thinking scores to [performance ratings](#), and studies documenting the value of critical thinking scores for [admission, student retention, and predicting successful licensure in professional education](#).

Effective instructional interventions should be expected to have a positive impact on critical thinking. Philip Abrami and several colleagues conducted a meta-analysis, published in the Review of Educational Research, which examined 117 studies involving 20,298 participants.<sup>7</sup> They report an average positive effect size (g+) of 0.341 and a standard deviation of 0.610, with fluctuations in critical thinking effect sizes related to the type of instructional intervention and pedagogy applied. Taken together "these findings make it clear that improvement in students' critical thinking skills and dispositions cannot be a matter of implicit expectation...educators must take steps to make critical thinking objectives explicit in courses and also include them in both pre-service and in-service training and faculty development." The conceptualization of critical thinking used in the Abrami et al research is the APA Delphi construct, the same construct used in the development of Insight Assessment tests and measures. Gains in critical thinking skills and mindset have been reported as the result of effective training programs after as little as a few weeks but more frequently the training program has been several months or longer in duration (a college course or an employee training program, as an example). With focused and [effective training techniques](#), these gains can be extremely significant, particularly in individuals who have not previously reflected on their reasoning process. Many longitudinal studies can be found in the peer reviewed literature documenting gains in critical thinking skills or mindset as the result of curriculum change or training programs designed for employee development. These studies have been conducted in many countries. Multiple professional degree granting programs have demonstrated significant gains in critical thinking skills using site-specific curriculum in the professional discipline.<sup>8</sup> One longitudinal study documented significant gains at posttest (after a two to three months training program) and the retention of these gains one year later.<sup>9</sup> Many other recent and on-going studies are listed in our [resources section](#). **In summary**, testing instruments sold by Insight Assessment have demonstrated the strongest evidence for validity (predictive/criterion validity) and have met the threshold for strong internal consistency reliability (a minimum Alpha of 0.80 for attribute measures and a minimum KR-20 of .72 for skills measures) for their OVERALL Scores and are observed to maintain this performance in all samples of adequate variance. These standards apply to published versions of the instrument in authorized translations developed in validation studies conducted in collaboration with our international scholar colleagues.



<sup>7</sup> Instructional Interventions Affecting Critical Thinking Skills and Dispositions: A Stage 1 Meta-Analysis. Philip C Abrami; Robert M Bernard; Evgueni Borokhovski; Anne Wade; et al, Review of Educational Research; Dec 2008; 78, 4; Research Library. pg. 1102

<sup>8</sup> Facione, N.C and Facione, P.A. Critical Thinking Assessment in Nursing Education Programs: An Aggregate Data Analysis. A research report. Millbrae, CA: California Academic Press, 1997.

<sup>9</sup> This well-designed assessment project is monitoring the effectiveness of a personnel training program designed for US Air Force personnel.

# Section 6: Resources and Training Strategies

Effective educational strategies can improve critical thinking skills and mindset.<sup>10, 11</sup> Insight Assessment offers [complimentary educational support materials](#) to clients to assist them with their training efforts. **THE LINKS ON THIS PAGE ARE LIVE LINKS.** If you are not reading this as a digital file, go to [insightassessment.com/article/resources](https://insightassessment.com/article/resources) to find all of these resources posted. We invite you to incorporate these links into program posts for educational purposes to help trainees obtain the most up to date versions of these materials.



## Importance of Critical Thinking

The documents, essays and discussions listed here are updated and new documents are added periodically. Thank you to these and many other authors for reprint permission of these materials for educational purposes. WE acknowledge Pearson Education for reprint permission of "Snap Judgments."

**Critical Thinking: What It Is and Why It Counts** This essay is included in many training programs. At the time of publication for this 2016 manual the essay can be downloaded in English, Spanish, and Simplified Chinese.

**Expert Consensus on Critical Thinking** Information about the APA Delphi Study that resulted in the multidisciplinary consensus definition of critical thinking, and related documents, can be found on this link.

**Characteristics of Strong Critical Thinkers** This post lists the characteristic of strong critical thinkers identified in the APA Delphi Study. These personal characteristics have since been endorsed by educators, business professionals and civic leaders around the world.

**Fifteen Positive Examples of Critical Thinking** At times it is helpful to think about common examples of when critical thinking is most important. This list of fifteen can help trainees develop a list relevant to their own life and work.

**Effective Techniques for Building Reasoning Skills** Training reasoning and decision-making skills and helping trainees and students to develop a thinking mindset requires that the trainer use effective methods. This list of strategies provides trainers with ideas to help them reframe current teaching and training methods to make them more effective for training critical thinking.

**Why a Measure of Numeracy (Quantitative Reasoning) is included in all assessments** Numeracy, the ability to reason in the context of numbers and proportional relationships, is very important in an increasing number of professions. A recent interest in assessing this context of critical thinking is discussed here.

**How are educators teaching critical thinking today?** This discussion highlights the increasingly pervasive expectation that training processes and group meetings should be more analytical and reflective when group problem-solving is occurring.

**Can critical thinking be assessed with rubrics?** How can a rubric best be used to assess critical thinking? This post discussed optimal measures with rubrics and cautions on misuse.

**Snap Judgments PDF** Do your trainees understand how humans really think? Can they see the value of training reasoning skills in the context of real life, high stakes decision-making?

**Perspectives that Influence Thinking and Knowing** This tool describes seven different ways that individuals see the world. These varying perspectives have a profound effect on how a person interprets new information, identifies problems (or fails to), and determines how or whether the problems can be solved.

**Talking Critical Thinking PDF** In this allegorical essay, which appeared in *Change: The Magazine of Higher Education*, we walk side by side with an academic dean who is preparing to explain to the Board of Trustees the importance of critical thinking.

<sup>10</sup> Abrami PC, Bernard RM, Borokhovski E., *et al*, (2008) Instructional Interventions Affecting Critical Thinking Skills and Dispositions, Review of Educational Research, Vol 78, 4, 1102-34.

<sup>11</sup> Facione N & Facione P (Eds.) Critical Thinking and Clinical Reasoning: An International Interdisciplinary Teaching Anthology. California Academic Press, Millbrae, CA, 2008.

[Tips on the Strategy of Interest-Based Negotiation](#) This discussion locates critical thinking in the context of election politics.

[Terminology for Discussing Critical Thinking](#) The consensus definition of Critical Thinking discussed in Section 1 and derived from the APA Delphi study provides an easily accessible terminology for discussing human thinking processes and habits of mind and for communicating the importance of critical thinking in training programs. This accessible terminology is included in Table 4 of the report and appears here with reprint permission. The table can be reproduced for use in educational programs.



## [Teaching, Training and Learning Tools](#)

WE acknowledge Dr. Carol Gittens (Santa Clara University) for permission to reprint The REWA and the Reflective Log. Thanks to the authors of "[Critical Thinking and Clinical Reasoning in the Health Sciences](#)" for their insight on best training practices. Thanks to Drs. Peter and Noreen Facione (Measured Reasons) for reprint of materials used in their training workshops.<sup>12</sup> Thank you to the USAF for the Performance Assessment Rubric.

[Sample Thinking Skills Questions](#) The sample skills test questions on this page are intended to illustrate the types of questions which might appear on a generic adult level reasoning skills test.

[Sample Items for Measuring Thinking Attributes](#) The sample "agree-disagree" style items on this page illustrate the types of statements that could appear on a college or adult level measure of critical thinking mindset.

[Critical Thinking Insight App](#) If you are looking for a critical thinking self-test, several are available through the Insight Assessment App.

[Mapping Decisions and Arguments](#) The diagramming method presented here enables us to render human decision-making, particularly in contexts of risk and uncertainty, much more transparent. Diagramming the reasoning enables reasoning to be externalized, objectified, and evaluated. As such, diagramming is a powerful aid to critical reflection for understanding and improving individual or group decision-making.

[Holistic Critical Thinking Scoring Rubric \(HCTSR\)](#) The HCTSR is a rating measure that can be used to assess the observable critical thinking demonstrated by presentations, reports, essays, projects, classroom discussions, panel presentations, portfolios, and other ratable events or performances. The HCTSR is available for download in several languages.

[Professional Judgment Rating Form \(PJRF\)](#) The Professional Judgment Rating Form (PJRF) was developed by our research team to make holistic assessments of critical thinking in educational and workplace settings.

[USAF Performance Assessment Rubric](#) This three point rubric rates the process of problem identification and analysis as "EXCELLENT: well defined problem, SATISFACTORY: adequately defined problem" and "DEFICIENT: wrong problem.

[Evaluating Written Argumentation \(REWA\)](#) This rubric is designed to provide detailed feedback on written material intended to argue persuasively on behalf of a given claim, opinion, or recommendation.

[Techniques for Trainers of Reasoning Skills and Decision Making PDF](#) This document is a concise list of valuable training strategies. Use these techniques to strengthen the training strategies you currently use to improve thinking skills and mindset in your trainee and student groups.

[Reflective Log](#) This critical thinking tool is intended to give structure and focus to journaling by students or trainees to integrate their insights about their thinking and decision-making.

[Participant Course Evaluation Form](#) This five-factor tool that can be used either for formative evaluation or to assist with mid-course corrections.

[Course Evaluation Design Discussion Questions](#) The assessment research team at Insight Assessment offers this set of guiding questions to faculty and academic leaders seeking an effective and integrated approach to student course evaluations.

[Critical Thinking Exam Questions and Study Guides for High Content Courses](#) See how "Why Correct?" and "Why Wrong?" formats convert standard content-based multiple choice items into explanations.

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<sup>12</sup> In addition to downloads from our website, many of the essays and teaching tools listed here can also be downloaded from the authors' academia.edu postings or from the Measured Reasons website.

**Critical Thinking Requirement Evaluation Guidelines** A set of guidelines for evaluating the position of critical thinking as an educational requirement in an institution’s general education or degree program learning outcomes.

**Question Asking Skills: A Leadership Training Tool** Question asking is key in unfamiliar and uncertain problem situations. Building questioning skills is an important part of training thinking skills.

**Training Session Feedback Form** This tool is intended to function as both a self-evaluation tool for the trainee and as an evaluation of the training program itself for its ability to engage the learner as intended. Completing the feedback form guides trainees to reflect specifically on their thinking experience related to the learning opportunity.

**Strong Critical Thinking in Groups** This one page tool guides evaluation of the quality of the thinking and decision-making demonstrated by the group process.

**The Culture of Thinking in your Organization** Use this tool to assess the culture of thinking and decision-making characteristic of your organization.

**Designing A Study of Workplace Productivity** Use this tool to infuse strong reasoning and decision-making into studies of workplace conditions or as an example of how strong thinking and decision skills are embedded in each step of a well- designed investigation.

**Training Critical Thinking and Clinical Reasoning** The following best practices essays are excerpted from “Critical Thinking and Clinical Reasoning in the Health Sciences.” Each essay provides an example of training reasoning skills and thinking mindset described by international experts in training clinical reasoning.

## **Research Findings**



Research reports linking key variables to critical thinking are increasing in many disciplines. These peer reviewed publications are written by researchers in a broad range of disciplines located at institutions around the world. Each entry provides the name of the paper, the author(s), the Journal/Year of Publication and a brief abstract of the publication. Mini titles make it easy to determine if the paper is relevant to your current work. These abstracts are offered to assist those preparing dissertation studies and proposals for grant funding and federal support. At the time of this publication **more than 100 research abstracts** are identified for these five topics to facilitate the sharing of these findings (updated periodically) and we encourage researchers notify us of peer reviewed publications. If you are not reading this as a digital file, go to [insightassessment.com/article/research-findings](https://insightassessment.com/article/research-findings) and click on the links to find articles in the following categories:

**Evaluating Training Techniques** This link connects you to a collection of studies describing and evaluating a variety of training techniques for evidence that they effectively train critical thinking skills or mindset.

**Learning Outcomes Assessment** This link connects you to a collection of studies reporting the outcome of assessment projects. Papers from general education projects, STEM education studies, health sciences training projects, and business education curriculum evaluation projects, are included.

**Admissions, Retention, and Licensure** These peer reviewed reports link critical thinking scores to professional licensure exam performance and other indicators of student success.

**Performance Ratings** Increasingly, strength in critical thinking factors into workplace assessment. These studies demonstrate that critical thinking scores are predictive of employer and preceptor ratings.

**Leadership, Skills and Mindset** What are the characteristics desired in leaders and decision makers? This collection of papers examines some potential relationships.

## Quotes about Thinking Courageously and Well



*"I strive never to forget the real world consequences of my decisions on individuals, businesses and government." Sonya Sotomayor*

*"The unexamined thought is not worth thinking" Pat Croskerry, M.D.*

*"A mind stretched by a new idea never goes back to its original dimensions." Oliver Wendell Holmes*

*"Quiet people have the loudest minds." Stephen Hawking*

*"Fix reason in her seat, and call to her tribunal every fact, every opinion. Question with boldness..." Thomas Jefferson*

*"Nothing in all the world is more dangerous than sincere ignorance and conscientious stupidity." Martin Luther King, Jr.*

*"The illiterates of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn." Alvin Toffler*

*"People can be extremely intelligent, have taken a critical thinking course, and know logic inside and out. Yet they may just become clever debaters, not critical thinkers, because they are unwilling to look at their own biases." Carol Wade.*

*"Critical thinking is skeptical without being cynical. It is open-minded without being wishy-washy. It is analytical without being nitpicky. Critical thinking can be decisive without being stubborn, evaluative without being judgmental and forceful without being opinionated." Peter Facione*

*"The important thing is never to stop questioning." Albert Einstein*

*"The first thing that parents can do is, in accordance with the child's age, temperament, and capacity, explain, explain, explain. Give reasons for decisions and punishments." Carol Tavis*

*"There's winning and there's losing and in life both will happen. What is never acceptable to me is quitting." Earvin 'Magic' Johnson*

*"I am convinced that what we believe has to be able to stand the test of evaluation. For example, the idea that teaching should be value free doesn't make sense." John Chaffee*

*"Education is nothing more nor less than learning to think." Peter Facione*



# Section 7: Customer Relationship



This section provides links to important legal messages and notifications pertaining to the use of Insight Assessment test instrument use licenses, including the fundamental agreement for the use of testing licenses, non-disclosure and non-compete agreement, buyer qualification, privacy, data security, instrument protection, disability accommodation, and copyrights.

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All of our Policies and Notices are available [on this link](#) (Combined posting). If you would like to search on specific topics use the list of live website links below.

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**Notice:** To assist a qualified purchaser to become more familiar with a particular assessment instrument or the use of our app based electronic testing system, we offer the opportunity to purchase a preview of the assessment experience. A preview provides you with one or more opportunities to view and experience the assessment from the perspective of the individual being assessed and to see the reporting options. Your account representative will set up your preview to include one or more opportunities to view the instrument using our mobile app on your computer or tablet (the profile page, an example of the assessment itself, and an example of the individual report that will be provided at completion of the assessment). Each preview also includes a digital copy of the user manual and resource guide for the specific instrument you are viewing. User manuals provide: a brief description of each metric being assessed by the instrument, a description of how to interpret both individual and group assessment results, a discussion of validity and reliability for the measures, all necessary information about administration of the assessment, and many additional resources that we hope you will find useful for designing your assessment project. Contact us to order a preview now, or receive your preview when you place your first order for assessments. **Notice: Previews -- Representatives of educational institutions, employers, researchers, government agencies, etc. can preview any of our high stakes assessment products previous to making a decision to adopt the instrument. Previews are provided to clients through the electronic testing system.** By entering a provided preview access code and password, the client can view the assessment just as it will be viewed by the candidate. The preview includes full information about the assessment instrument, its administration and examples of the assessment report provided (digital user guide). Even if you eventually decide to administer an assessment in paper and pencil format, we will provide your preview of the instrument through the electronic system. Previews are sold only to qualified agency representatives. If consideration of the adoption will be made by a committee or several individuals, talk with our customer service agents about setting up the preview to fit your needs. Doctoral students can also apply to preview assessment instruments: search "[Doctoral Dissertation Research Pricing](#)" for more information. Personal assessments can be purchased by anyone who would

like to assess their own critical thinking. Each assessment is sold separately, and although previews are not available, free sample questions are included with the download of the free app, "[Critical Thinking Insight](#)."

## Cookie Policy

Insight Assessment will not share any personal information with third parties. The privacy of our customers and test takers is important to us. What are Cookies? We use "cookies" to collect information on this site. A cookie is a piece of data stored on a site visitor's hard drive to help us improve your access to our site. Cookies can enable us to track and target the interests of our users to enhance the general experience of our site. Usage of a cookie is in no way linked to any personally identifiable information on our site. If you would like to delete cookies or instruct your web browser to delete or refuse cookies, please visit the help pages of your web browser. However, if you do not accept cookies, your experience on our site may not be optimal and some features of our site will not function. How are cookies used on the Insight Assessment websites? Information you provide us: This site will track form data in a browser's memory until it is closed down. We do this in order to eliminate the need for users to re-enter form data: Name, Email, Organization, Phone and Title. Functional cookies: Anonymous site performance cookies: this information helps us continually improve your experience. This website will track the pages you visit (on our site) via Google Analytics and AwStats. These tools allow us to analyze the use of our website. Based on this information, we can evaluate the use of our website and compile reports about website activities. This information ultimately helps to optimize our offerings to you on our website. We may collect information about your computer, including your IP address, operating system and browser type, for system administration and in order to create reports. This is statistical data about our users' browsing actions and patterns and does not identify any individual.



Authentication: Test takers and Client Administrators: We may use essential cookies to authenticate assigned test takers, to prevent fraudulent use of user accounts, to maintain the relationship between a test taker and their responses and to protect test data and assessment instruments. App Access: Individuals who access assigned tests or personal assessments via our free *Critical Thinking Insight* app should check their app store's cookie policy to see if they use cookies. Third Party Cookies: Our systems use services from other providers which collect and store information about our users. These include Google Analytics and the various app stores. However, we have no access to or control over these cookies. We do not permit any third party advertising. Google Analytics Like many services, Google Analytics uses first-party cookies to track visitor interactions as in our case, where they are used to collect information about how visitors use our site. We then use the information to compile reports and to help us improve our site. Google Analytics collects information anonymously. It reports website trends without identifying individual visitors. You can opt out of Google Analytics without affecting how you visit our site – for more information on opting out of being tracked by Google Analytics across all websites you use, visit this [Google page](#). For further information about how Google Analytics uses cookies and IP address data, see: <https://support.google.com/analytics/answer/6004245>. App administration of tests: Individuals accessing tests via our app, Critical Thinking Insight should refer to the cookies policy of their app store. How do I turn off cookies? It is usually possible to stop your browser accepting cookies, or to stop it accepting cookies from a particular website. All modern browsers allow you to change your cookie settings. You can usually find these settings in the "options" or "preferences" menu of your browser. Use the "Help" option in your browser for more details.

## Appendix B: Consent Form / Information Sheet

Dear Participants,

I would like to thank you for agreeing to participate in my study and being part of it. The purpose of this concurrent mixed study is intended to investigate the existing critical thinking (CT) and moral reasoning (MR) skills within the BSc nursing curriculum and examine the quality of clinical decision making among the UAE nursing students within a culturally competent care.

First, you are required to answer the California Critical Thinking Skills Test (CCTST) questionnaire. The (CCTST) questionnaire is an instrument that will be completed online through the Insight Assessment website ([www.insightassessment.com](http://www.insightassessment.com)) that are going to be contacted to approve and open access to the participant to axes the test as per their protocol. The CCTST contains 34 multiple-choice questions related to broad situations and expected to take 45 minutes from the participants to complete approximately.

All your data are going to be treated anonymously and your name and your present institutions will be treated with high confidentiality and will never be shared with anyone.

For further details and questions kindly feel free to contact me [hadia.rasheed@fchs.ac.ae](mailto:hadia.rasheed@fchs.ac.ae) .

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Your participation is highly appreciated.

Thank you.

Hadya Abboud.

## Participant Information Sheet

### *Title of Study*

The impact of nursing education curriculum and workforce preparation on students' critical thinking, moral reasoning and cultural sensitivity in UAE.

Dear Colleagues,

I am Haday Abboud Abdul Fattah and I am conducting this research study in your facility as a requirement for my PhD study at the British University in Dubai

#### **What is the study about?**

The purpose of the current concurrent mixed study is to investigate the impact of the nursing education curriculum and workforce preparation on students' existing critical thinking (CT) and moral reasoning (MR) skills within the BSc nursing curriculum and examine the quality of clinical decision making among the UAE nursing students within a culturally competent care.

#### **Why have I been approached?**

You have been approached because the study requires information from fourth year students, internship year seniors and the graduated nurses who have experience the nursing curriculum in UAE to investigate to what extent the nursing educational curriculum impacts on the students' preparation on CT, MR skills in the UAE. Then examining what influence do the workplace preparations have on the students' performance on CT, MR and cultural sensitivity in the UAE.

#### **Do I have to take part?**

No. It's completely up to you to decide whether or not you take part in this study or not

#### **What will I be asked to do if I take part?**

If you decide you would like to take part, you would be asked to sign the consent form and complete the California Critical Thinking Skills Test (CCTST) questionnaire to fulfil the research aims.

#### **Will my data be Identifiable?**

The information you provide is anonymous. You are not going to be asked to put your name or student number on the questionnaire.

#### **What will happen to the results?**

The results will be presented to defence my dissertation and can be used for publication in an academic or professional journal in the future.

#### **Are there any risks?**

The researcher is there to make sure that there are no risks predicted with your participation in this study. Though, if you knowledge risk or any kind of distress subsequent to your participation, you can notify the researcher and contact the provided resources at the end of this sheet.

**Are there any benefits to taking part?**

Though your information are valuable to the researcher and there are no direct benefits in taking part you may find participating experience interesting.

**Who has reviewed the project?**

This study has been reviewed and approved by the Faculty of Educational Research Ethics Committee at the British University in Dubai

**Where can I obtain further information about the study if I need it?**

For further enquiries about the study, please contact the core researcher:

Hadya Abboud Abdul Fattah

Tel: 00971507733262

Email: [Rasheed\\_hadia@yahoo.com](mailto:Rasheed_hadia@yahoo.com)

[Hadia.rasheed @fchs.ac.ae](mailto:Hadia.rasheed@fchs.ac.ae)

Supervisors name and contact

Prof. Sufian Forawi

Tel: 00971501270746

Email:

[sufian.forawi@buid.ac.ae](mailto:sufian.forawi@buid.ac.ae)

**Complaints**

If you wish to make a complaint or raise concerns about any aspect of this study and do not want to speak to the researcher, you can contact:

Prof. Sufian Forawi

[sufian.forawi@buid.ac.ae](mailto:sufian.forawi@buid.ac.ae)

Thank you for taking the time to read this information sheet.

Appendix C: the communications with the California family of critical thinking tests.



Measuring Thinking Worldwide

Application for Doctoral Dissertation Data Gathering Research Pricing	
Your full name	Hadya Abboud Abdel Fattah .
Your Best Phone Number	0971 50 77 33 262 .
Your Best email address	hadia.rasheed@fchs.ac.ae .
Street Address City, State or Province, Country	United Arab Emirates / Al Ain
Name, Title, and email of Faculty Dissertation Advisor	Prof. Sufian Forawi / Sufian.forawi@buid.ac.ae
Planned degree program:	PhD science education.
Degree granting College or University:	The British University in Dubai .
City, State or Province, Country	UAE , Dubai .
Title of dissertation	"Nursing education Curriculum and workforce Preparation of the students' critical thinking, moral reasoning and cultural sensitivity in UAE"
Very brief statement or your research question(s)	<ol style="list-style-type: none"> <li>To what extent does the nursing education curriculum impact on the students' performance on critical thinking, moral reasoning and cultural sensitivity in UAE?</li> <li>What influence do the workplace preparations have on the students' performance on critical thinking, moral reasoning and cultural sensitivity in UAE?</li> </ol>
Estimated quantity of test licenses required.	1
Note: Each license permits 1 person to take 1 test 1 time.	
Estimated date(s) of testing	August - september 2018.
Assurance that you will comply with all the provisions and restrictions	I understand that I will be purchasing licenses to administer protected instrument made available through Insight Assessment. I assure that I will make provisions to guarantee the security of these instruments. I will safeguard all testing materials, administer the instruments correctly as specified in their User Manuals, and comply with all notices posted in the manual or on the Insight Assessment website. I will interpret the resulting data reports with integrity. The data will be used in accordance with the appropriate standards on the ethical use of tests of individual difference and measures collected on human subjects (see your test manual for an example of a standard guideline).
Your acknowledgement and assurance of non-violation of copyright	I acknowledge that all Insight Assessment test instruments, answer forms, and testing app screens are protected by US and international copyright laws and are the intellectual and scholarly property of the copyright holders. I assure that no copyright(s) will be violated. No copies will be made of the testing instruments or any of their questions, in whole or in part. Neither the tests, nor the data reports will be made available for sale to other parties. I understand that I may, however, quote material from a User Manual or the Insight Assessment public website with the appropriate citation.

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SAN JOSE, CA. 95112-4511 USA

[www.insightassessment.com](http://www.insightassessment.com)

PHONE (650) 697-5628  
FAX (650) 692-0141

Hi Hadya,

Thank you for your interest in the California family of critical thinking tests. These instruments are in use around the world to test critical thinking skills and dispositions in students and working professionals. Tests are scored either in our electronic testing system or here at the company. We protect the CCTST from wide distribution, selling only to qualified buyers who provide us with their full name and university affiliation or workplace title and address.

We have given permission for many doctoral students to use the instrument in their dissertation research. You can read all the necessary information for doctoral students at:  
<http://www.insightassessment.com/How-to-Purchase/Doctoral-Dissertation-Research-Pricing>.

We require that you complete our dissertation pricing application form (attached) so that we will know the name of your university and advisor, and determine if you are a qualified buyer. Please also indicate whether you would be testing on-line or in paper and pencil format.

If you are a qualified buyer: We must also have a letter from your doctoral professor verifying your student status and indicating that they will take the responsibility for overseeing your use and protection of the instrument. Once again, this information is on the webpage above. You can send these two documents by fax or by e-mail attachment back to Insight Assessment (1.650.692.0141). The letter from your dissertation professor must be prepared and signed on University stationary.

Once we have received these materials and your application has been approved, we can provide you with information about obtaining a sample of the CCTST and the test manual, and also provide you with a price quote for using the instrument.

Best Wishes,

Ariel

**From:** Hadya Abboud Abdel Rahim Abdel-Fattah <[Hadia.Rasheed@fchs.ac.ae](mailto:Hadia.Rasheed@fchs.ac.ae)>

**Sent:** Tuesday, March 6, 2018 9:17 AM

**To:** Ariel Yeung <[ayeung@insightassessment.com](mailto:ayeung@insightassessment.com)>

**Subject:** RE: Insight Assessment - response to your inquiry about CCTST

Dear Ariel,

Thank you for your prompt replay .

Yes, I am currently a Ph.D. student at the British University in Dubai and a senior lecturer at Fatima College of Health Sciences.

My study is exploring the nursing curriculum preparation of the critical thinking of the UAE nursing students. My study is totally on my personal expenses away from any support from the college as I am working on my own professional development . I am very interested in using the CCTST in my dissertation as I found many articles that have relied on your test to measure the critical thinking of the students and some have implemented it on the UAE nursing students as well .

My study is planning to test around 145 female nursing students .

Kind Regards.



**From:** Ariel Yeung [<mailto:ayeung@insightassessment.com>]

**Sent:** Monday, March 5, 2018 9:51 PM

**To:** Hadya Abboud Abdel Rahim Abdel-Fattah <[Hadia.Rasheed@fchs.ac.ae](mailto:Hadia.Rasheed@fchs.ac.ae)>

**Subject:** Insight Assessment - response to your inquiry about CCTST

Dear Hadya Abboud,

Thank you for contacting us. I see that you are a Ph.D student at British University in Dubai and a senior lecturer at Fatima College of Health Sciences. Are you interested in using CCTST in your dissertation? Or are you inquiring on behalf of FCHS? I assume you are testing students. If so, how many? If you can provide more information about your project, I'd be happy to prepare a price quote for you.

Thank you again and look forward to hearing from you.

Ariel Yeung

Customer Relations Specialist

1-650-697-5628

[www.insightassessment.com](http://www.insightassessment.com)

Hi Ariel,

Many thanks for your valued detailed email which reflects your proficiency in the field.

I will work on providing you with the requested documents after my meeting with my DOS at the British University In Dubai as he will lead my directions to seek the needed approvals.

Kind Regards.

## Appendix D: Al Ain hospital ethical approval



### AAH Research Ethics Committee

TO: Hadya Abboud Abdul Fattah; [Hadia.rasheed@fchs.ac.ac](mailto:Hadia.rasheed@fchs.ac.ac)  
Senior Nursing Lecturer, Fatima College of Health Sciences (FCHS)  
Institute of Applied Technology Al Ain, United Arab Emirates

CC: AAH Research Ethics Governance Committee

Date: 20<sup>th</sup> December 2018

RE: **Proposed Research Study:** *The impact of nursing education curriculum and workforce preparation on students' critical thinking, moral reasoning and cultural sensitivity in UAE. Emirates: 2012–2018*

Ref: AAHEC-12-18-106

Dear Hadya,

On behalf of the Al Ain Hospital Research and Ethics Governance Committee, I am pleased to confirm a favorable ethical opinion for the above research on the basis described in the application form and supporting documentation.

The favorable opinion is given provided that you comply as per the context set out in your research study.

You are hereby advised to commence your research study at Al Ain Hospital. In keeping with our policy, the AAH Research and Ethics Governance Committee is kindly requesting you to report any ethical concerns/considerations that may arise during the course of your research, in a timely manner.

Annual Reports plus terminal reports are necessary and the Committee would appreciate receiving copies of abstracts and publications should they arise.

The REC approval is only valid for two years (24 months from the date of the approval letter issued) however it should be renewed yearly for the continuation of the approval. Two (2) months before expiry of the validity period, the Continuing Review Form should be submitted to REC. Late submissions may not be processed in time, and you are not allowed to continue the study without approval.

The Committee is wishing you a success for this project.

Respectfully yours,

  
Dr. Ghanem Ali Al Hassan  
Chairman, AAH Research Ethics Committee  
*Acting Deputy Chief Medical Officer*  
Al Ain Hospital



**AAH REGC Checklist**

**Principle Investigator:** Hadya Abboud Abdul Fattah

**Title of project:** The impact of nursing education curriculum and workforce preparation on students' critical thinking, moral reasoning and cultural sensitivity in UAE.

**Place of the Study** ✓  Al Ain Hospital     Other facility name:

If required, did your application get approval from SEHA Research Ethics Committee for the submission to our Committee?

**Please indicate if any of your Co-investigators a member of the AAH REGC?** if yes, his/her name is:

Topic	Checklist item description	Please circle the answer	Page Number
<b>PI Signatures</b>	Did you have your original signature as the Principle Investigator and that data presented are true (Two personal signatures required)?	Yes No	
<b>Co-Investigators Signatures</b>	Did your all co-investigators read and approved this application, agree to be accountable to the study, and signed the application form?	Yes No	None
<b>Chair signature</b>	Did your direct chair of the Department or Supervisor (For Master and PhD students) approved this study, agrees to submit it to our REGC, and signed the application?	Yes No	
<b>Place of study</b>	Did you mention the exact place/ location/Department, Institution, college, hospital where this study is going to be held in.?	Yes No	

## AAH REGC Checklist

Topic	Checklist item description	Please circle the answer	Page Number
Personal Identifiers	Does your study involve collecting personal identifiers, personal data, personal measures of participants, or private information?	Yes <b>No</b>	
Protection of personal data	Did you describe how would you protect personal identifiers, personal data, personal measures of participants or their private information in detail?	<b>Yes</b> No	
Application form	Did you use our AAH REGC application form?	<b>Yes</b> No	
Filling the form	Did you answer all questions in the application? If non applicable you have to explain why?	<b>Yes</b> No	
Subjects	Did you mention which are the subjects to be studied, their sample size and the period in which the study will be done?	<b>Yes</b> No	
Health Care Provider	Did you mention who are the health care providers and which facility gives them the licence in case research subjects will have personal measurements or blood samples?	Yes <b>No</b>	None
Consent	Did you attach the consent forms in required languages	<b>Yes</b> No	

NB: A filled checklist is a requirement for every human research ethics application. It should be submitted at the same time with the application.

**AAH REGC Checklist**

Topic	Checklist item description	Please circle the answer	Page Number
Exempt research	Do you think your study is an exempt research? (Please refer to the DOH REC Standard Procedure, 2012, version 1, page 18 to know what an exempt research is. If yes your application may not need to be reviewed by the Committee but only by the Chair of REC).	Yes      No	
References	Did you limit your references to a maximum of 15 references?	Yes      No	

**Principal Investigator**

Name:

Date

Signature:

**Hadya Abboud Abdul Fattah****28/10/2018**

## Appendix E: Fatima College Research Ethics Committee (REC) approval.



### Fatima College Research Ethics Committee (REC)

08/04/2019

#016 – Hadya Abboud Abdel Rahim Abdel-Fattah

Dear Hadya

**Re: Ethics approval for research – Research Ethics application FCHS/RECA/#016/2018-19**

Study Title:	The impact of nursing education curriculum and workforce preparation on students' critical thinking, moral reasoning and cultural sensitivity in UAE
REC reference:	#008
Protocol number:	2
Approval date	08/04/2019
Expiry date	08/04/2022
FCHS REC Decision	Approved

The FCHS Research Ethics Chair reviewed the revised application sent on 13<sup>th</sup> March 2019.

The following documents were received electronically:

1. 2019 CCTST User Manual 9.3.18
2. 2016121156\_Hadya\_Abboud\_proposal V4 (1)
3. BUID Final ethical approval
4. Certificate MRC ( Good Research Practice ) Hadya 2018
5. Consent Form Hadya v2
6. FCHS APPFCHS LICATION FOR ETHICAL APPROVAL OF RESEARCH PROJECTS INVOLVIN...
7. FCHS Research Comm Appln template 13 March 2019 Hadya
8. Participant Information Sheet Hadya (003)V4
9. Response to reviewer v4

On the basis of the information detailed in the revised application form and accompanying documents, it is agreed that your research application meets the requirements and that ethical approval has now been approved. **Please note that this application only approves the research of FCHS students/staff alone within your study. You are still required to seek ethical and appropriate research approval for**

**other organizations as you have already indicated in your application. On this basis, this application is approved pending approval from other ethics committees.**

This approval is based on the information provided and should any substantial amendments to any aspect of the study change, then it is incumbent on the investigators to notify the FCHS REC.

**Statement of compliance**

The Committee is constituted in accordance with the FCHS Director arrangements. The REC complies fully with the Research Policy, Section 13 of the FCHS, Policies and Procedures Manual, Version: REV-0, August 1<sup>st</sup>, 2016, Sections 13) and the international and local standards for research involving human subjects.

**After ethical review**

Now that you have completed the application process please familiarize yourself with the Research Policy, Section 13 of the *FCHS, Policies and Procedures Manual, Version: REV-0, August 1<sup>st</sup>, 2016, Section 13.*

Please quote this number in all correspondence: **FCHS/RECA/016/2018-19**

With the Committee's best wishes for the success of this project.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Chris Hayre', written in a cursive style.

Dr. Christopher Hayre  
Chair, FCHS Research Ethics Committee