

The Relationship between Learning Styles and Self-Efficacy with Critical Thinking Disposition among Technical Institute Nursing Students

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1. ABSTRACT

Background: Understanding the various styles of learning that are used by nursing students also is important so that educators can adapt their mode of teaching to meet the needs of the students. In addition to learning styles, it is important for educators to understand critical thinking dispositions and advocates matching teaching methods to student's learning styles. **Aim:** To determine the relationship between learning styles and self-efficacy with critical thinking disposition among technical institute nursing students. **Design:** A descriptive correlational design was utilized. **Sample:** 324 students at Technical Institute of Nursing-Mansoura University. **Tools:** Three tools were used for data collection namely, Students' Learning Styles, Student Self-Efficacy Scale, and California Critical Thinking Disposition Inventory (CCTDI). **Results:** Most of nursing students reported that they prefer visual learning style that followed by auditory preference and finally kinesthetic/ tactile preference. The majority of nursing students reported to high self-efficacy, and they had the highest percentage of truth-seeking dimension and followed by self-confidence. **Conclusion:** The current study concluded that, there's no relationship between nursing students' learning styles, self-efficacy, and critical thinking disposition except self-efficacy with truth seeking that was statistically significant correlation. **Recommendations:** Combine leaning activities that support nursing students in developing self-efficacy and motivate students to promote CTDs for problem solving and decision making in personal as well as professional life and developed further studies in other faculties of nursing to generalize.

Keywords: Nursing education program, Learning styles, Self-efficacy, Critical thinking disposition.

2. Introduction:

Nursing education is constantly changing to meet the ever-changing needs of the nursing profession (Falk & Dierking, 2019). All these multiple challenges can raise the tension and stress on nursing educators to choose an effective teaching strategy to have a qualified nurse for the reason of working in different health care settings and provide patient care competently; as well these challenges put an emphasis on the student to use different ways, methods, and style to learn (Wege & Keil, 2020).

Learning is a complicated set of behaviors that includes taking in knowledge, imparting it to others, and receiving support from both subject matter as a source of knowledge and media as intermediates or teaching aids that help the learning process to continue (Syofyan & Siwi, 2018). To make it simpler for students to accept and understand the subject matter, both are mutually integrated into teaching activities. As a result, they are both included in the knowledge transformation process that teachers and students carry out (Sondakh, Rahmatullah, Adiyono, Hamzah, Riwayatiningasih & Kholifah, 2022).

The method that various student's study is known as their learning style. A student's preferred method of information intake, processing, comprehension, and retention is referred to as their learning style. There are four main types of learning: kinesthetic, tactile, auditory, and visual (Simmons & Marquis, 2017). These are amazing for a variety of reasons. To start, nursing students' learning habits will change because everyone is naturally different from one another. Second, offer the chance to instruct using a variety of techniques in a lively manner that motivates a tedious learning environment, so each one will amuse the lesson (Newton & Miah, 2019).

The three learning styles visual, auditory, and kinesthetic should be understood by teachers since they are representations of each student's individuality that are important to education. In order to help students, become motivated or motivated to learn, which is helpful for obtaining greater learning outcomes, teachers are expected to use the design of appropriate teaching models for all students in the classroom (Yusnanto & Rahayu, 2022).

Learning styles have six principles: Firstly, both the style the educator uses to teach and the style the learner chooses to learn can be specified. Secondly, educators had a requirement to be defensive against relying on specific method or tool which only coincide the own learning style (Carulla & Hipona, 2018). Thirdly, preceptors are most advantageous when they aid students to recognize and learn by using their own style preferences. Fourthly, students should have the scope and chance to learn through their preferable style. Fifthly, students should be inveigled to have more than one style preference; finally, educators can evolve special activities for learning that advocate students' modality or style (Mohamed & Thabet, 2021). So, the consciousness by using different strategies and using various methods and equipment considered to be a key for the growth used of different learning styles and help learner to master cognitive skills as problem-solving, decision making, creativity, critical thinking skills and dispositions (Syofyan & Siwi, 2018).

Nurse educators are increasingly interested in comprehending and incorporating students' learning preferences into nursing courses to foster fulfilling learning experiences that lead to the creation of academic excellence standards (McKenna et al. 2018). Although there is debate and disagreement on learning styles, how students learn and how they choose to study affects the kinds of learning activities and assignments that could be employed in higher education courses most effectively depending on the ideas (Deale, 2019). Once more, it was believed that self-efficacy beliefs and the levels of student accomplishment will be positively impacted by learning styles (Bakaç, 2022).

Self-efficacy is one of the requirements for effective learning in nursing education. Student's self-efficacy is described as their confidence in their capacity to succeed in a given scenario, which influences their choice of activities, effort, and perseverance. Students' perceptions of their self-efficacy for academic accomplishment are shown to be influenced by their views about their ability to learn, which in turn affects the academic objectives they set for themselves and their ultimate academic performance (Lee, 2020).

Self-efficacy helps students adjust to and deal with the new learning environment and is impacted by gender, age, and domain. It is a powerful determinant of students' academic achievement (Mohamed & Morsi, 2019). High self-esteem individuals have a strong sense of

efficacy and view challenging activities as chances to improve their talents (Mamolo, 2022).

As well as teachers and instructors will perform better and engage with students more effectively if they are aware of the elements impacting e-learning. It should be noted that students cannot develop information literacy without developing their critical thinking abilities (Janakiraman, 2018). As a result, CT is not developed "naturally or accidentally," there is a need to activate it by encouraging students to reflect on what they see or believe they know in order to create new knowledge, solve issues, and/or make appropriate judgments (Merma-Molina, Baena-Morales & Urrea-Solano, 2022).

2.1 Aim of the study

The present study aims to determine the relationship between learning styles and self-efficacy with critical thinking disposition among technical institute nursing students.

2.2 Research questions

- Q1. What are the learning styles and self-efficacy among technical institute nursing students?
- Q2. What is the critical thinking disposition among technical institute nursing students?
- Q3. What is the relationship between learning styles and self-efficacy with critical thinking dispositions among technical institute nursing students?

3. Method

3.1 Design

Descriptive correlational design was utilized in the present study.

3.2 Setting

The study was conducted at Technical Institute of Nursing-Mansoura University.

3.3 Participants

The sample will consist of a random sample consist of (324) nursing students at second year at academic year (2021-2022) because they have more awareness about academic learning.

3.4 Sample size

The sample size was estimated with the following method based on data from the literature (Mahmoud, 2012), level of significance of 5%, and power of study of 80%.

$$\text{Sample size} = [(Z_{1-\alpha/2})^2 \cdot SD^2] / d^2$$

Where, $Z_{1-\alpha/2}$ = is the standard normal variate, at 5% type I error it is 1.96

SD = standard deviation of variable

d = absolute error or precision.

So, sample size = $[(1.96)^2 \cdot (10.1)^2] / (1.1)^2$
=323.9. Based on the above formula, the sample size required for the study is 324 students.

3.5 Data collection tools:

Data collected by using three tools

Tool (I): Students' Learning Styles Questionnaire.

It was adopted from **Carulla & Hipona, (2018)** to determine the learning style of the nursing students. This tool includes two parts. The first part includes personal data as students' age, gender, marital status, and residence. Second part comprised of 24 questions separated into three types (VAK) in terms of visual preference (8 items), auditory preference (8 items), and tactile preference (8 items). Accordingly, each response was assigned a score from along a 5-point scale, varying from (1) Strongly disagree, (2) Moderately disagree, (3) Undecided, (4) Moderately agree, (5) Strongly agree.

Tool (II): Student Self-Efficacy Scale

It was adapted from **Schwarzera (2013)** and modified by the researcher. It includes 10-items to examine nursing students' perceptions of self-efficacy as a factor contributing to academic advancement. Students responded using a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). The mean score across all 10 items yielded a total score, with higher scores implies stronger general self-efficacy.

Scoring System: total self-efficacy level was classified as following: Based on cut of value <50% Low level

50%-70% Moderate level

>75 High level

Tool (III): California Critical Thinking Disposition Inventory (CCTDI)

Adopted from **Facione & Facione (2008)** It consists of 75 items to assess critical thinking disposition. It was divided into seven dispositional characteristic subscales, including truth seeking (12 items), open-mindedness (12 items), analyticity (11 items), systematically (11 items), self-confidence (9 items), inquisitiveness (10 items), and maturity (10 items). The seven dispositional traits' items were all mixed up. On a 5-point Likert scale, the students' responses ranged from "strongly agree" to "strongly disagree."

3.6 Validity and reliability:

Study tools was tested for its content validity by a panel of five expertise academic staff from Faculty of Nursing at Mansoura University who revised the tools for clarity, applicability, comprehensive, understanding, and ease for implementation and according to their opinions, modifications were done. Reliability test of the study tools was done, was tested by using Cronbach alpha test. Three tools were modified and translated to Arabic language by the researcher. The reliability of learning styles, self-efficacy and critical thinking disposition were (0.70), (0.71), (0.73), respectively.

3.7 Pilot Study

A pilot study was out on 33 nursing students, or 10% of the total, to confirm that the instruments are clear and relevant. According on the results of the pilot research, the appropriate adjustments were made., and the pilot study will be excluded from the study sample.

3.8 Ethical consideration

Ethical approval was obtained from the Research Ethical Committee of Faculty of Nursing, Mansoura University. Students are given an explanation by researchers. All participants were informed that the study is voluntary, and they have the right to withdraw from the study at any time. All participants were assured about the confidentiality of the collected data and the privacy of the study sample was assured at all phases of the study.

3.9 Field work

It was consisted of two phases, preparatory phase and data collection phase as following

1-Preparatory Phase

This process was started by obtaining approval from the concerned authorities in the previous mentioned setting. Tools for data collection was designed after reviewing the national. Then pilot study was conducted on 33 students. This process took about one month from beginning of January 2022 to the beginning February 2022.

2-Data collection phase

The current study was carried out from the beginning of February to the end of June. Data was collected Technical Institute of Nursing at Mansoura University from the second academic year of nursing students at academic years 2021-2022. The researcher was present in the setting six days a week from 9 a.m. to 1 p.m. till all data had been collected. The researcher interviewed each

student individually for about 20 - 25 minutes to collect data by using the data collection tool.

3.10 Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 25, SPSS Inc. Chicago, IL, USA). Continuous variables were represented as mean, and standard deviation. Independent t-test was used to test the difference between two means of continuous variables. Pearson correlation coefficient test was conducted to test the association between two continuous variables. Statistical significance was considered as (p-value ≤ 0.05 & 0.01).

4. Results:

Table (1) shows personal characteristics of the studied technical institute nursing students. According to the table 98.9% of nursing students were 19 years old or less, while 1.5% of studied technical nursing students had more than 19 years old. This table revealed more than a half of studied students were 61.2% female and were 95.4% single and were lived in rural area.

Table (2) shows mean and standard deviation of learning styles of technical institute nursing students. This table revealed the highest percentage was 61.4% reported to moderately / strongly agree by studied technical institute nursing students for visual preferences. While about 53.1 % of studied technical institute nursing students strongly disagree for Kinesthetic / tactical preference. The total means of overall visual preference learning style items, auditory preference learning style items, and tactical preference learning style items were 29.41, 26.03, 21.62 respectively.

Figure (1) shows percentages of different learning styles as perceived by technical institute nursing students. This figure revealed the highest percentage was 61.4% reported to moderately / strongly agree by studied technical institute nursing students for visual learning and followed by auditory learning and tactical learning 46.3%, 36.4% respectively. As well as about of 53.1% studied technical institute nursing students strongly disagree for tactical preference. While 35.5% of studied technical institute nursing students strongly disagree for auditory preference and followed by 16.7% for visual preference Table (3) shows number & percentage of self-efficacy as perceived by studied technical institute nursing students. This table revealed the highest percentage was 76.9 % reported to moderately / strongly agree by studied technical institute nursing students for it is easy for

them to stick to their aims and accomplish their goals and followed by 76.5 for if they in trouble, they can usually think of a solution. As well as about 18.8% of studied technical institute nursing students strongly disagree for, they can solve most problems if they invest the necessary effort and followed by 15.1 for if they confronted with a problem, they could usually find several solutions. The total means of overall self-efficacy items represents 38.40 ± 3.38

Figure (2) shows levels of self-efficacy as perceived by technical institute nursing students. This table revealed that the highest percentage was 65.1% reported to high self-efficacy by studied technical institute nursing students. As well as about 34.9% of studied technical institute nursing students have moderate level 50%-75% Table (4) shows mean and standard deviation of critical thinking disposition among technical institute nursing students. In this table the highest mean was 42.03 reported to truth seeking and followed by open-mindedness and systematicity that 40.38 and 36.58 mean score respectively. While 30.32 mean score was reported for inquisitiveness and followed by 30.57 for self-confidence.

Figure (3) shows mean percentages of critical thinking disposition among technical institute nursing students This figure revealed that the highest percentage was 70.05% reported to truth seeking by studied students. As well as about 58.61% for analyticity among studied students.

Table (5) shows the relationship between learning styles and self-efficacy with critical thinking disposition among technical institute nursing students. This table revealed there's no relationship between learning styles, self-efficacy and critical thinking disposition among technical institute nursing students except self-efficacy with truth seeking that was statistically correlation **IV**.

5. Discussion

Nursing education is always evolving. New and novel teaching tactics are required to fully satisfy the needs of the profession (**Wage & Keil, 2020**). Nurse educators are in charge of designing learning settings. Learning is a process in which pupils are engaged in ways that best suit their different learning styles. The challenge for nurse educators is to establish learning settings that promote critical thinking by applying a variety of skills and tactics. Nurse educators must understand how to validate linkages between learning styles and preferred teaching techniques in order to balance all students' generational learning patterns with reputable pedagogical approaches (**Simpson, 2020**).

As Regards to Technical Nursing Students Learning styles

Planning for successful and efficient learning now heavily takes into account the learning preferences and methods of nursing students. Additionally, the goal of higher education is to develop competent individuals with strong problem-solving and critical thinking abilities (Salari& Zarifi, 2018). The nursing students get knowledge of their own learning preferences and feel much better about the surroundings they engage with. Every chance a student must learn is a chance for them. The choice to adopt various methods and, to some degree, build one's learning styles, rests on the student (Albar& Sari, 2021).

The results of the present study showed technical nursing students reported the highest mean scores for their preference for visual learning. This could be because students rely on the facilitator's or instructor's nonverbal clues, such as body language, to aid in comprehending. This is consistent with (Elgzar et al., 2019), who examined the various learning preferences of nursing students at Najran University and look at the connection between learning preferences and preparedness for self-directed learning. They concluded that more than half of nursing students learn primarily through visual language.

The current study's findings are consistent with those of (Alharbi, Homood, et al., 2017), who carried out a cross-sectional survey to look at nursing students' preferred methods of learning at King Saud University in Saudi Arabia. They found that among their participants, visual learning was most prevalent, followed by active learning (Kinesthetic). Kinesthetic learning is appropriate for nursing practice in a skill lab or hospital because it helps students imitate real-world scenarios and develop soft skills like critical thinking, problem-solving, and communication.

The knowledge is better understood and retained by students who use a visual learning method. Although auditory learners are adept at listening, they learn best by hearing what is spoken in a classroom. Additionally, tactile, and kinesthetic learners like practicing and engaging in hands-on activities (Carulla, Hipona, 2018). The visual, auditory, and kinesthetic/tactile learning styles of nursing students were recognized by learning style theory. The content is best understood by pupils that have a visual learning approach. Auditory learners, on the other hand, are good listeners and learn best from what they hear. Additionally, kinesthetic and tactile learners love

getting their hands dirty (Falk, Falk& Jakobsson, 2016)

As regards to Technical Nursing Students Self-Efficacy

Self-efficacy is a broad notion that describes how much individuals think they are capable of handling challenges or stressors. A strong belief in one's capacity to exercise control over motivations and behaviors is necessary in addition to the necessary abilities. Self-efficacy has an impact on how people feel, think, and behave when taking risks (Fuad, 2020). Students who consider themselves to be very effective in each area of activity are more inclined to perform a task associated with that area. Consequently, self-efficacy directly affects behavior (Pekkala & van Zoonen, 2022).

Nursing students' self-efficacy assists them to become competent in clinical practice. Self-efficacy is a significant indicator to forecast performance of nursing students in clinical settings. Clinical training of competent nursing staff demands courage and dedication (Zengin et al.2014).

Findings of the present study revealed that the highest percentage was reported to high self-efficacy by studied technical institute nursing students. This may be due to students affiliated to college were provided with students' support services and activities rendered to other students affiliated to all faculties of the university. The present study results are in the same line with (Orgambidez, Borrego& Vázquez-Aguado, 2020 & Orgamb, Borrego & Vazquez-Aguado, 2019) who reported the same high mean score and most nurses had high level of self-efficacy. Academic self-efficacy leads to increased educational aspirations directly and indirectly. Michelle, (2015) noted that students who have high self-efficacy are more conscientious and actively participate in accomplishing activities than students who have low self-efficacy and frequently start a task and sustain the effort required to achieve.

Along with the results of the current study, Mohamed& Morsi (2019) also found that the majority of nursing students had a high level of academic self-efficacy. This outcome was consistent with Alexander's (2020) assertion that academic self-efficacy is a significant internal source of motivation that can pique students' interests in the early stages of the behavioral process. Therefore, when students are exposed to a new educational environment, it is crucial to take their academic self-efficacy into account.

In the same vein, according to **Alexander (2020)**, academic self-efficacy plays a critical role in explaining students' accomplishment expectations, joyful learning expectations, and expected devotion to the subject matter. In the same line as the structural model evaluated by **Bong, Cho, Ahn, and Kim (2012)**, who discovered that self-efficacy is a good predictor of task value (**Batool, Atta & Riaz, 2020**). Moreover **Batool, Atta & Riaz, (2020)** mentioned several elements that influence self-efficacy, but one of the most important ones that is hypothesized to effect nurses' self-efficacy as occupational stress and marital status.

A study by **Abd Allah& El-Shahat, (2019)** revealed that the highest percentage of nursing students had high level of self-efficacy. As the same results of study had done by **Haerazi & Irawan, (2020)** found that nurses who has high self-efficacy will be able to solve problems themselves. This finding was agreed with **Elsayed, Mahmoud& Ismail, (2013)**, who found that nursing student had high self-efficacy.

Additionally, **Abdel Naby, (2018)** **Rezayat& Nayeri, (2013)**, **Karabacak et al. (2013)** found that most of nursing students had high self-efficacy. According to **Athira, Kaviyabala, Sayujya, Varsh& Buvanewari (2017)**, who performed a study on self-efficacy among nursing students and discovered that general self-efficacy was high among nursing students. In addition to **Abdel Naby (2017)**, who discovered that the majority of nursing students exhibited good self-efficacy.

As regards to Technical Nursing Students Critical Thinking Disposition

In the modern-day changing healthcare environment according to **Kaya, Enyuva& Bodur (2017)**, critical thinking (CT) has become one of the most important and fundamental elements of providing safe and effective nursing care and improving service quality. The term "critical thinking dispositions" (CTDs) refers to mental traits or routines that are incorporated into a person's convictions or behavior to support critical thinking (**Abou Hashish& Bajbeir, 2018**). To be able to make wise judgments and address clinical issues, nurses, who serve as front-line healthcare professionals, need to be emotionally intelligent, critical thinkers, creative, and self-directed. The ability to utilize one's own judgement is a crucial indicator of critical thinking (**Azizi-Fini, Hajibaghery& Adib-Hajbaghery, 2015**). In addition, **Sosu (2013)** proposed two criteria for the

disposition of critical thinking: reflective skepticism and critical openness.

The current study's findings showed that technical nursing students had a moderate critical thinking propensity. This might be as a result of the fact that developing critical thinking takes a lot of time and is anticipated to grow as students' years of education, experiences, professional knowledge, and abilities expand. This is agreed with (**Abou Hashish & Bajbeir, 2018**) who study the emotional intelligence among Saudi nursing students and its relationship to their critical thinking disposition among Saudi Nursing Students at College of Nursing- Jeddah, Saudi Arabia. They discovered that the majority of nursing students have a moderately strong capacity for critical thought and a reasonably high degree of emotional intelligence. This may lead to the conclusion that nursing students tend to reflect on their prior experiences and challenge the veracity of evidence. (**Shakurnia& Baniasad, 2018**). And (**Sultana& Gul ,2021**) mentioned if more educators possess strong level of CTDs, they will be able to better demonstrate their CT behaviors and influence their students. And (**Sultana& Gul ,2021**) mentioned if more educators possess strong level of CTDs, they will be able to better demonstrate their CT behaviors and influence their students.

Regarding the study done by **Zarabian et al. (2016)** who study nursing students' critical thinking dispositions were studied at Suez Canal University's Faculty of Nursing, and it was discovered that the majority of nursing students had a favorable tendency toward all critical thinking dispositions. Additionally, according to **Gholami et al. (2016)** and **Pai & Eng (2013)**, the majority of nursing students had ambivalent dispositions toward all aspects of critical thinking. This may be because problem-based learning, which is used as an instructional strategy at the faculty of nursing, encourages students to think critically and solve problems through group discussions.

Findings of the present study revealed high percentage for truth seeking and followed by self-confidence and followed by open-mindedness and systematicity then inquisitiveness and followed self-confidence and finally analyticity. This may have had a role in the fact that after the first academic year, critical thinking skills increased. It was commonly believed, but not shown, that the nursing curriculum and learning environment had an impact on some improvements in critical thinking.

Regarding **Mahmoud (2012)**, who discovered that nursing students at two nursing

schools using various teaching methods scored highly on the sub-scale measuring truth-seeking and open-mindedness. Critical thinking was inversely correlated with academic advancement. Positively correlated with intuitive and visual learning, but adversely with verbal learning, is self-confidence. (Mahmoud, 2012) revealed that general critical thinking was lacking. positive attitudes toward pursuing the truth and having an open mind.

The ability of the nurse to participate effectively in the complicated healthcare environment depends on their capacity for critical thinking (Mahmoud & Mohamed, 2017). The nurse is empowered to think independently, meaningfully, and critically by using critical thinking (Dunne, 2019). Therefore, it is crucial to support nursing students in developing their critical thinking abilities (Zhang et al., 2017). Due to the requirement for nursing school graduates to critically assess data and information in their profession, (Wu & Wu, 2020) said nursing training programs with a focus on critical thinking have been promoted. This is the same viewpoint held by Mahmoud & Mohamed (2017), who chose to challenge convention.

As Regards to Relation Technical Nursing Students' Learning styles, Self-Efficacy, with Critical Thinking Disposition

Critical thinking in nursing is considered essential for delivering quality care and reflects the professional accountability of registered nurses. It is also a crucial component of the duties and clinical tasks that nurses are required to do. Additionally, critical thinking among nurses has the power to affect care outcomes in both positive and bad ways. Thus, it is crucial that nursing education integrate instructional methods that foster the critical thinking of bachelor's degree nursing students in order to prepare them for their professional obligations (Wu & Wu, 2020).

Once more, critical thinking and learning are intertwined; information is acquired via thought. The pupils need to be more cognizant of the cognitive processes in order to be able to increase the depth and breadth of an individual's knowledge (Huhn, 2017). A person's ideas or behaviors are shaped by their experiences and observations, and one's thoughts and knowledge are formed as a result. This process is known as critical thinking. According to the assertion, CT disposition was very important to undergraduate students (Oh, Cho & Yim, 2021). Li, Wu, He, Liu & Xiao, (2020) advised educational staff to adopt instructional

practices that support students' growth in critical thinking.

Findings of the present study revealed that there's no relationship between learning styles, self-efficacy, and critical thinking disposition among technical institute nursing students except self-efficacy with truth seeking that was statistically correlation. To encourage critical thinking and fulfilling learning experiences, nurse educators must comprehend and incorporate students' learning ways into nursing courses. They must also inspire their students to apply critical thinking dispositions when addressing issues and making judgments. As the sole justification offered by (Kabeel & Eisa, 2016) students must embrace innovative strategies to make them interactive participants, widen and stimulate higher-level thinking and problem-solving talents, and expand their brains.

Furthermore, Khempet (2018) said that undergraduate students were encouraged to exercise decision-making and problem-solving on their own with regard to educational problems, interpersonal and relational issues, and other things in most nations, including Thailand. In addition to micro-domains reflecting age, internal values orientation, learning and studying approaches, prior experiences, socialization processes, and other subjective parameters on moods and emotions at the time of questionnaire completion, both grounded learning styles and critical thinking capacities may be influenced by macro-domains like culture, secondary educational background, and socio-economic status. These might be regarded as important hints for the discrepancies that surfaced among research (Huhn, 2017).

Finding of the present study revealed no significant difference of self-efficacy and critical thinking dispositions in relation to personal characteristics of the technical institute nursing. This is agreed with (Sulaiman et al., 2017) who found no significant gender differences with critical thinking measures. While Ahmad and (Putri & Prodjosantoso, 2020), Turan, 2020) showed female was comparatively better in critical thinking. This is agreed with Boso et al. (2021) results which revealed a significant effect of EI on CT disposition irrespective of gender.

In current study found no significant difference of self-efficacy and critical thinking dispositions in relation to age. The result of the current study is consistent with (Ghazivakili, 2014) They discovered no connection between learning style and either age or educational attainment. In contrast, Karabacak et al. (2013)

found no statistically significant difference in the self-efficacy levels of the students' age, gender, and educational level before and after skill training. This is disagreed with (Saleh, 2019) who found statistically significant positive correlation was detected between nursing students' ages and their levels of self-efficacy. This might be related to that as nursing students' progress in their study years they had more experience, more maturity, and trained in several and different clinical learning environment.

Overall, the results of the current study showed that there was no significant correlation between general tendencies toward critical thinking and learning methods. This is in agreement with Mahmoud (2012) study findings, which showed that among undergraduate nursing students at King Khalid University's Faculty of Nursing, there is no correlation between learning styles, self-efficacy, and critical thinking disposition. In this context, (Kaya, 2018) saw clinical experience as a fundamental component favorably enhancing students' critical thinking dispositions.

Hence, Cheng & Wan, (2017), stated that the content being taught could affect positively critical thinking dispositions of students. Moreover Ajam, (2022) who recommended training learners with acceptable critical thinking and high academic self-efficacy will positively effect of learning and helps students overcome systems, be more self-aware, analyze ideas more effectively and have more control over their learning and values in life.

Finding of the present study is contradicted with Kim (2018), Newton & Miah, (2019) who reported a positive relationship between self-efficacy and critical thinking propensity. This is similar to Hung et al. (2021), who reported a positive relationship between self-efficacy and clinical performance ability. As well as Uzdil & Gunaydin, (2022) mentioned students' academic self-efficacy levels may be related to the general characteristics of the school where nursing education is received, as well as depending on their personal characteristics.

6. Conclusion

Based on the study findings a visual preference learning style is major among technical nursing students and followed by auditory preference and finally kinesthetic/ tactile preference. Furthermore, most of the technical nursing students reported they had a high self-efficacy. and moderate deposition for critical thinking. They reported truth seeking dimension is the highest dimension as perceived by studied

nursing students and followed by self-confidence dimension of critical thinking disposition among studied nursing students.

The study concluded that there was no relationship between learning styles, self-efficacy, and critical thinking disposition among technical institute nursing students except self-efficacy with truth seeking that was statistically correlation. However, the scores of truth-seeking critical thinking disposition were higher than other dimensions.

7. Recommendations:

Based on the study finding, the current study recommended the following:

- Nursing degree programs must include component of CT in curriculum, designing courses, teaching plans and teaching strategies.
- The nursing educators should be able to identify their students' learning styles to maximize their learning potentials and use teaching strategies that fit to different learning styles and enhance CTDs.
- Improve the efficiency of nursing students through different leaning, teaching methods
- Combine leaning activities that support nursing students in developing self-efficacy.
- Motivate students to use CTDs for problem solving and decision making in personal as well as professional life.
- Teaching strategies should be integrated in the curricula early in the educational process to encourage both the development and practice of critical thinking.
- The Nursing curriculum should combine leaning activities that support nursing students in developing self-efficacy, which donated the nursing students an opportunity to think more positively
- Identify the facilitator and barriers in nursing education to develop self-efficacy and critical thinking among students
- Identify teaching strategies that promote the development of critical thinking skills is needed.
- The curriculum should include all tools, materials, texts, and activities that match all learning styles of students in the classroom.
- Participate in the learning process so that learning gains can be achieved well.

- Future research should focus on developing strategies to promote the development of self-efficacy, and critical thinking skills.

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Table (1): Personal characteristics of the studied technical institute nursing students (n=324)

Characteristics	No.	%
Age years		
▪ ≤ 19 years	319	98.5
▪ > 19 years	5	1.5
<i>Mean±SD</i>		<i>18.95±0.28</i>
Gender		
▪ Male	142	43.8
▪ Female	182	56.2
Marital status		
▪ Single	309	95.4
▪ Married	15	4.6
Residence		
▪ Rural	233	71.9
▪ Urban	91	28.1

Table (2): Mean and standard deviation of different learning styles of technical institute nursing students (n=324)

Learning styles	Strongly disagree / Moderately disagree		Undecided		Moderately agree /Strongly agree		Mean±SD
	No.	%	No.	%	No.	%	
▪ Visual preference	54	16.7	71	21.9	199	61.4	29.41±3.36
▪ Auditory preference	115	35.5	59	18.2	150	46.3	26.03±3.32
▪ Kinesthetic / tactical preference	172	53.1	34	10.5	118	36.4	21.62±3.21

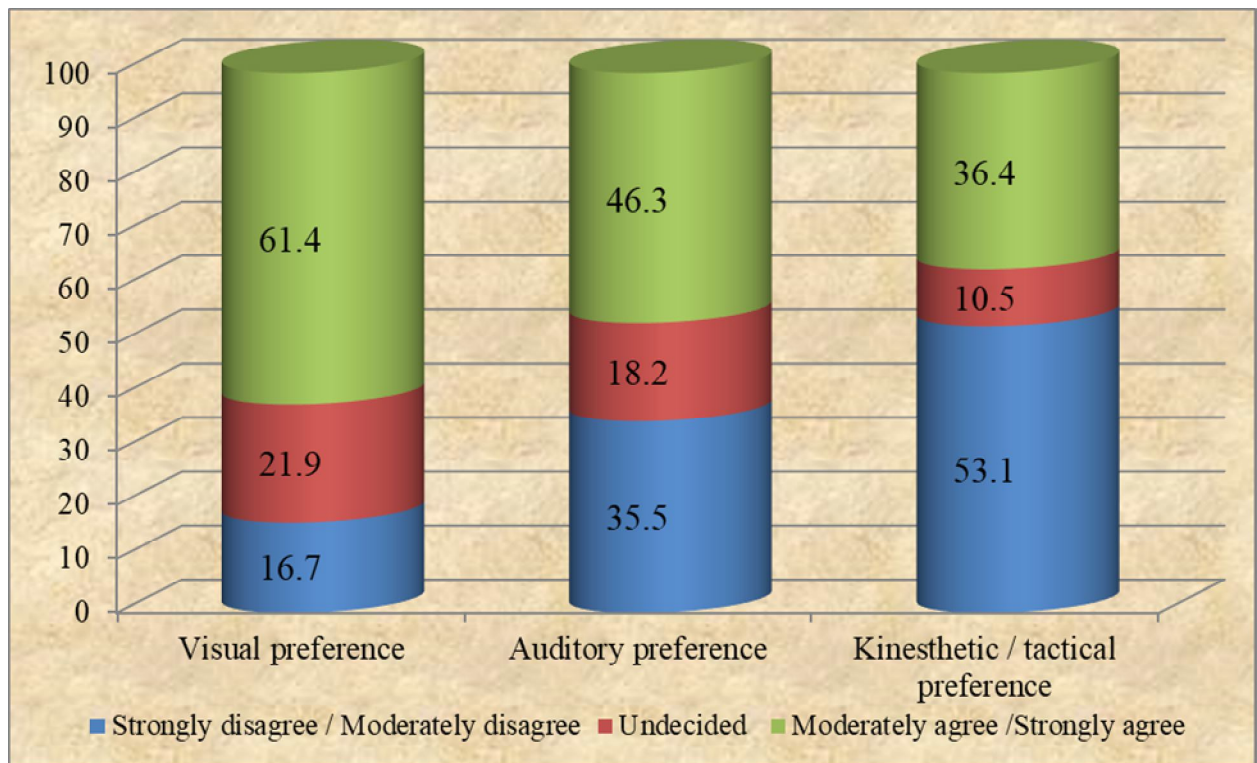


Figure (1): Percentages of different learning styles as perceived by technical institute nursing students (n=324)

Table (3): Number & percentage of self-efficacy as perceived by studied technical institute nursing students (n=324)

Statements	Strongly disagree / Disagree		Neutral		Agree /Strongly agree	
	No.	%	No.	%	No.	%
▪ I can always find a solution to handle complex issues if I work hard enough.	9	2.8	92	28.4	223	68.8
▪ If someone disagrees with me, I can still find ways to achieve my goals.	42	13.0	63	19.4	219	67.6
▪ I can stick to my plans and complete my objectives with ease.	29	9.0	46	14.2	249	76.9
▪ I'm sure I could handle unforeseen circumstances effectively.	33	10.2	58	17.9	233	71.9
▪ I'm resourceful, therefore I know how to deal with unanticipated circumstances.	33	10.2	53	16.4	238	73.5
▪ If I put in the required effort, I can solve the majority of difficulties.	61	18.8	132	40.7	131	40.4
▪ I can rely on my coping mechanisms to help me maintain my composure in the face of challenges.	44	13.6	61	18.8	219	67.6
▪ When I have an issue, I can generally come up with a few solutions.	49	15.1	69	21.3	206	63.6
▪ In most situations, I am able to come up with a workaround.	30	9.3	46	14.2	248	76.5
▪ Usually, I am able to manage any situation that arises.	31	9.6	53	16.4	240	74.1
Total	36	11.1	67	20.7	221	68.2
<i>Mean±SD</i>	<i>38.40±3.38</i>					

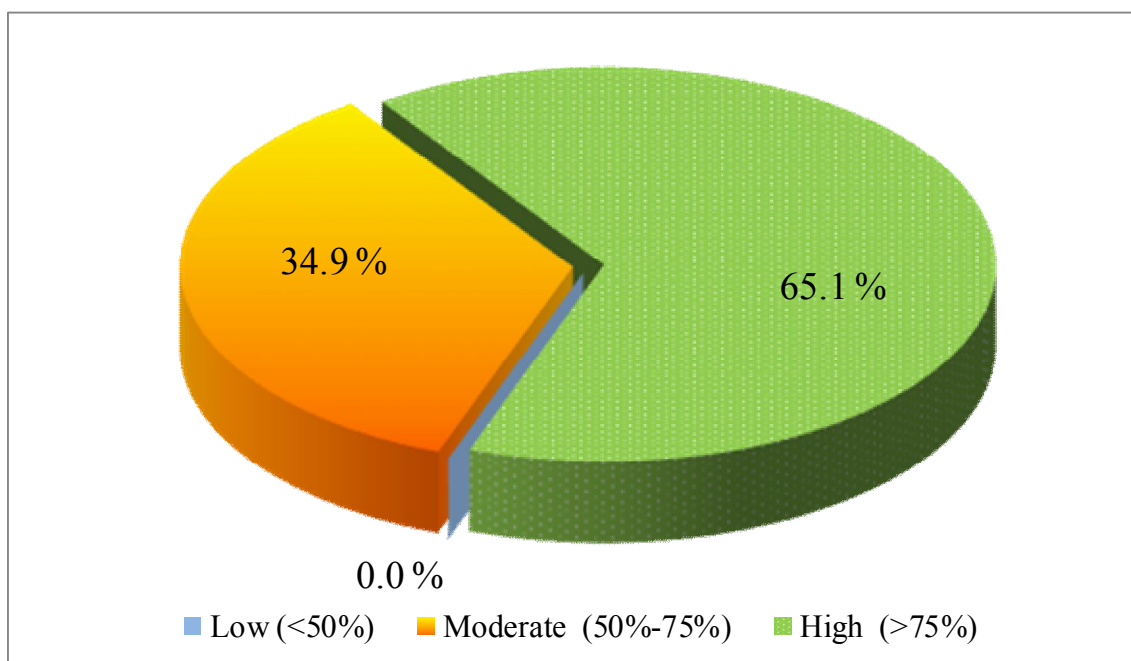


Figure (2): Levels of self-efficacy as perceived by technical institute nursing students (n=324)

Table (4): Mean and standard deviation of critical thinking disposition among technical institute nursing students (n=324)

Critical thinking disposition domains	No of items	Min - Max	Mean±SD
▪ Truth seeking	12	30.0-56.0	42.03±3.35
▪ Analyticity	11	21.0-46.0	32.24±3.57
▪ Systematicity	11	26.0-46.0	36.58±3.07
▪ Self-confidence	9	23.0-38.0	30.57±2.79
▪ Inquisitiveness	10	20.0-39.0	30.32±3.79
▪ Open mindedness	12	28.0-55.0	40.38±4.19
▪ Maturity	10	18.0-47.0	30.62±4.07
Total critical thinking disposition	75	320.0-478.0	242.74±11.27
Mean percentage	64.73		

* Mean percentages related maximum scores

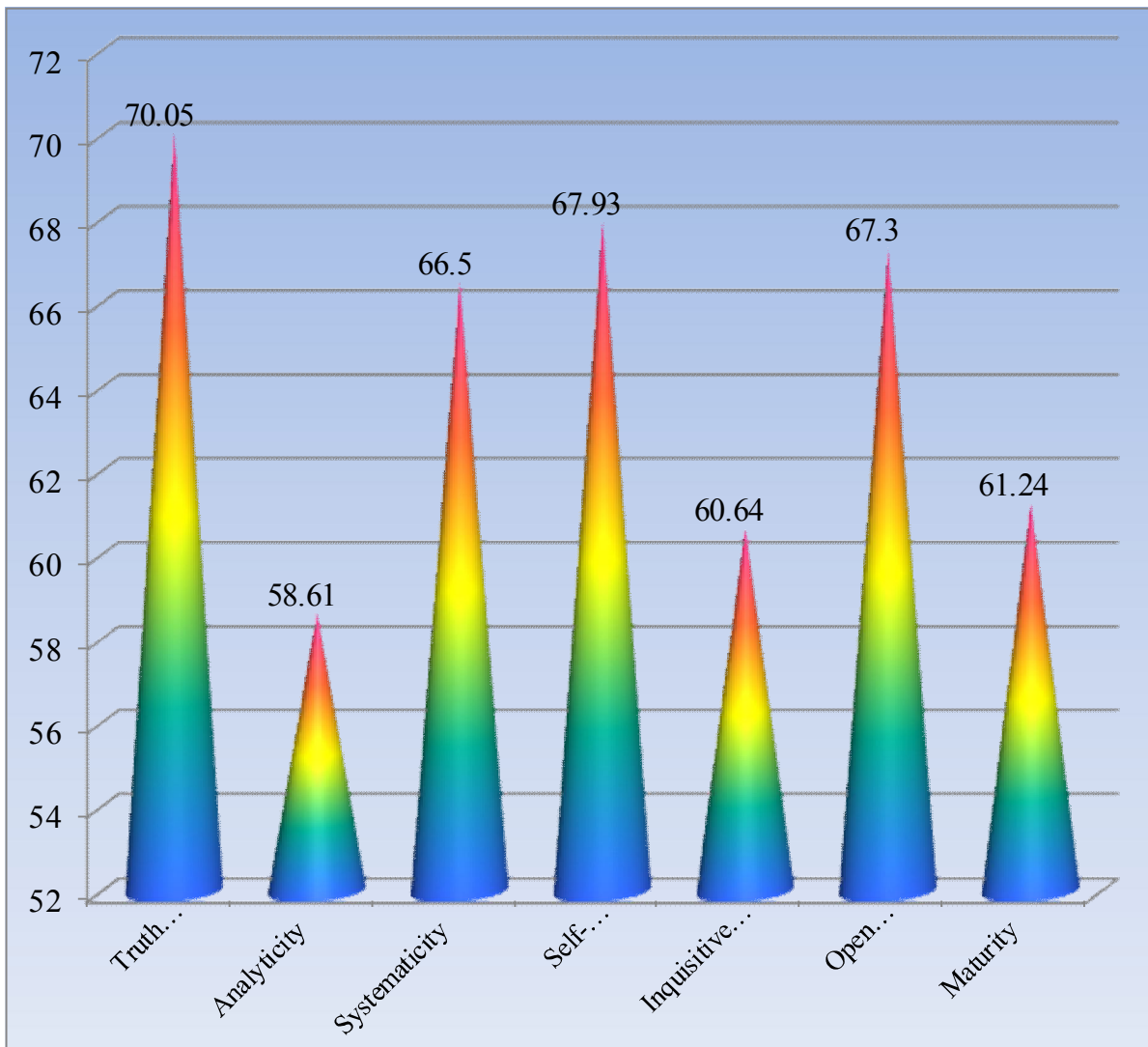


Figure (3) Mean percentages of critical thinking disposition among technical institute nursing students (n=324)

Table (5) The Relationship between learning styles and self-efficacy with critical thinking disposition among technical institute nursing students (n=324)

Critical thinking disposition domains	Visual preference		Auditory preference		Kinesthetic/ tactile preference		Self-efficacy	
	R	P	r	p	r	P	r	P
▪ Truth seeking	0.006	0.92	0.10	0.06	0.004	0.95	0.14	0.01**
▪ Analyticity	0.008	0.89	0.04	0.39	0.15	0.009**	0.003	0.95
▪ Systematicity	0.01	0.78	0.07	0.18	0.04	0.44	0.02	0.63
▪ Self-confidence	0.02	0.76	0.006	0.91	0.07	0.20	0.02	0.63
▪ Inquisitiveness	0.004	0.95	0.02	0.73	0.03	0.53	0.04	0.46
▪ Open mindedness	0.09	0.08	0.02	0.61	0.02	0.76	0.05	0.32
▪ Maturity	0.01	0.81	0.04	0.45	0.09	0.08	0.07	0.20
Total critical thinking disposition	0.03	0.56	0.08	0.13	0.09	0.10	0.03	0.55