Original Article

# Evaluation of the Role of Creative Educational Climate in Reflective Thinking Tendencies in Students of Qaen Nursing and Midwifery Faculty

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## Abstract

**Background & Objective:** The main goal of research in the field of creative educational climate is to achieve results applied to persuade students to think freely, creatively, and critically. This study aimed to determine the role of a creative educational climate in reflective thinking tendencies in students.

**Materials and Methods:** This descriptive and correlational study was performed on all students studying in the school of nursing and midwifery of Qaen in the academic year of 2015-2016 (N=300). The sample size was estimated at 169 using the Krejcie and Morgan's table and the participants were selected applying the stratified random sampling. Data were collected using Kember's reflective thinking questionnaire (2000) and Ekvall's creative climate scale (2013). Data analysis was performed in SPSS version 22 using independent t-test, Pearson's correlation coefficient, analysis of variance, and regression.

**Results:** In this study, the total mean and standard deviation of creative educational climate and reflective thinking tendencies was reported to be 176.52±29.67 and 61.32±8.10, respectively. According to the results, there was a significant relationship between the components of creative educational climate and reflective thinking tendencies ($P<0.01$). Moreover, the components of the creative educational climate were able to predict students' reflective thinking tendencies ($P<0.000$). On the other hand, no significant difference was observed between male and female students in terms of reflective thinking tendencies ($P=0.711$).

**Conclusion:** According to the results of the study, establishing a creative educational climate improves thinking and focus, thereby affecting reflective thinking tendencies. It is recommended that the components of a creative thinking climate by considered by professors to increase students' participation in discussions. By doing so, they would play a considerable role in the use of strategies of reflective thinking tendencies. It is also suggested that a creative educational climate be considered in educational environments by educational planners.

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## Introduction

In the era when scientific concepts are rapidly growing and continuous innovations are experienced, changing the ultimate goal of education is inevitable. In other words, the traditional teaching methods and passive position of students in the educational environment and reliance on filing the mind with information do not respond to the training needs of the current generation (1). Proper training of students requires encouraging them to think creatively, freely, critically, and scientifically. In fact, programs of training centers must transfer intellectual discipline to students. These programs must be arranged in a way that they would force students to be involved in the issue instead of saving scientific facts and be increasingly equipped with thinking skills to make proper decisions, solve complicated issues in the society, and deal with the developments of the 21st century (2). Human beings can use their thinking ability in the face of different issues and affairs. Reflective thinking must be recognized as part of education when there is a sense of the need for rationality (3). Dewey defines reflective thinking as "active, persistent, careful consideration of a belief or supposed form of knowledge in light of the grounds that support it and the further conclusions to which it tends" (4). Developing reflective thinking is so important that it is considered the main goal of education and academic experiences by reflective thinking theorists. In fact, they believe that education must only focus on teaching students how to think (5). Several sources and studies have supported the need for reflective action in education and its necessity in the education of health professions. This is mainly due to the fact that this type of thinking process simplifies decision-making in complicated situations and is recognized as a key skill used to facilitate learning from experience, self-evaluation, self-monitoring, and retaining competence. This ultimately leads to the improvement of patient care quality.

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A reflective action is also a tool for professional development, integration of art, and guaranteeing high patient care quality. In addition, it has been introduced as a valuable element in medical education programs (6). Academic education is responsible for creating an environment that helps students learn and gain cognitive, emotional, and psychomotor skills. Acquiring creative thinking skills is essential for students in order to obtain the required information personally and develop essential information perception techniques (7). An academic learning environment plays an important role in the learning experience of students, creating a scientific identity and socialization in the academic culture (8).

Quoting Dewey, Fuzards used the term "reflective thinking" for this process for the first time. According to other critical thinking experts, critical thinking is reflective and reasoned thinking used to decide about what we believe or do. In this view, critical thinking is a practical activity that requires creativity and identification of hypotheses, questions, options, and test methods. Students deal with situations that require critical thinking in order to provide safe and proper care (9). Nursing is one of the important fields in medicine and nursing students play a considerable role in patient care decisions. Therefore, critical thinking can help students identify patients' needs, select the most appropriate technique, and make the best decision (10, 11). Moreover, experts believe that critical thinking skills are essential for the medical sciences (12, 13). Today, medical education emphasizes the use of educational methods that allow students to think openly and critically, explore, have the autonomy, and be able to flourish their professional competency and attention to others (14, 15). In addition, one of the main goals of medical education is preparing students to deal with dynamic situations outside the classroom (12).

Even though it is generally believed that creativity is a sign of the educational systems of the modern world, preparing a safe and suitable climate in the classroom and using active and exploratory educational methods by professors can help students use their creativity (16). According to Ekvall, an educational environment includes a set of attitudes, feelings, and behaviors that affect innovation, satisfaction, and efficiency of individuals (17). A creative educational climate is one of the most important factors for success and satisfaction and determines the behaviors of students. Therefore, it is crucial to measure the educational climate in terms of environmental review and idealization of the environment (18). Given the rapid changes in societies, students need competencies that would be beyond their textbooks and could be used to evaluate and analyze information (19). Students can attain work skills in interactive learning methods by the continuous organization of the educational process based on new approaches. In addition, interactive education creates an environment that can help students think creatively (20). While various studies have been performed on reflective thinking tendencies and factors affecting this issue, it seems vital to assess the effect of a creative educational climate on reflective thinking tendencies. Accordingly, the main question asked is whether a creative educational climate affects critical thinking tendencies or not.

Dewey considers four subsets for reflective thinking; "normal act", which is a constant and automatic activity that occurs with a low consciousness, "understanding", in which a person uses the knowledge available as long as knowledge is formed through existing meaningful insights and perspectives and no creativity occurs, "reflection", which is constant and active attention to any idea raised, and seeking the best perspective and ultimately "critical reflection" as a higher level of reflective thinking that includes knowing why we understand issues and how we feel and act. Performing a skill requires both mastering the skill and having a desire toward its use (4).

One of the most influential people in this research area, Mezirrow has proposed an applied, important, reasoned, and conceptual framework for evaluating this concept. This scholar distinguishes reflective activities from non-reflective activities and believes that not every awareness of thoughts and feelings is a

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reflection. He separates two types of activities: "non-reflective", which is a normal type of act such as typing and driving, and "reflective", which includes a selective review of previous learnings and intentional evaluation (21). The hospital environment is one of the most active working environments for medical staff, physicians, and patients, interactions of whom lead to learning and gaining experience in human resources. However, this is only possible if the learning climate of this environment contributes to this type of training and provides an opportunity for growth and development of human resources and the organization by focusing on the formation of organizational learning abilities, thereby improving the services provided in this regard (22).

It is essential to create and promote educational environments that can prepare competent students considering that medical universities play a significant role in the training of human resources required to maintain the society's health (18). A literature review revealed that reflective action can affect the development of professional competencies, self-guidance, self-awareness, critical thinking, and problem-solving (23). Critical thinking is one of the components of clinical decision-making and a criterion for the clinical efficiency of professionals and medical students and an important factor for improving professional autonomy. In addition, it is a vital part of evidence-based medicine (13). Today, increasing attention is paid to the effect of the educational environment on the basic learning of students. Moreover, the quality of the educational environment has been recognized as an important factor for the effectiveness of educational programs (18). Most universities in the world seek to find educational methods that could improve clinical decision-making capacities, as well as continuous and self-centered learning of medical students (15). According to the results obtained by Rezaei et al. (2016) and other researchers, students of medical universities have an unfavorable level of critical thinking, which is the necessary background related to making the best and most appropriate decisions in the most critical moments in the field of health. In addition, educational programs of universities have failed to increase the level of students' skills and focus on this area in educational curricula (24). Given the significant effect of education on students' success and satisfaction, attempts must be made to receive feedback from students in terms of their perception of educational environments (25).

Since the educational climate is the most important factor that supports creativity, it is necessary that the professor and educational official awareness programs of the country be considered prominent, and the methods of strengthening the creativity of learners be considered. With this background in mind, this study aimed to determine the role of a creative educational climate in the reflective thinking tendencies of medical students.

## Materials and Methods

This descriptive and correlational study was performed on all midwifery and nursing students (N=300) of Qaen, Iran in 2015-2016. The participants were selected by random stratified sampling by receiving the information of students in each field of study from the education manager of the school. Afterwards, the number of students in each discipline was determined in proportion to the size of the community. A number of students whose proportions in each discipline fit the size of the community volume were randomly selected. in total, 169 students were selected using the Krejcie and Morgan's table. Data were collected using the questionnaires below: A) Kember's reflective thinking questionnaire: this tool was established by Kember et al. to evaluate students' reflective thinking. The questionnaire's items are scored based on a five-point Likert scale and its validity has been confirmed (26). In addition, factor analysis of the questionnaire demonstrated that the scale does not evaluate a one-dimensional trait. Therefore, four factors were recognized, each encompassing four items. The items included: 1) normal action, 2) comprehension, 3) reflection, and 4) critical thinking. The scale's validity and reliability have been evaluated by Kember & Long. The construct validity determined four subscales. The validity obtained for the subscales were, as follows: normal act (0.62),

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comprehension (0.75), reflection (0.63), and critical thinking (0.67) (21, 26). In addition, Cronbach's alpha obtained for the subscales of the normal act, comprehension, reflection, and critical thinking were reported at 0.65, 0.74, 0.81, and 0.87, respectively, which showed proper validity compared to Kember's research (21). The tool's reliability was reported at 0.73 in the current research. Notably, the questionnaire encompasses 16 items and four subscales (four items per subscale). Overall, the items 1, 5, 9, and 13 are related to the component of normal act, whereas the items 2, 6, 10, and 14 are related to comprehension. In addition, items 3, 7, 11, and 15 are related to reflection while items 4, 8, 12, and 16 were related to critical thinking. The items were scored based on a five-point scale (from completely disagree=1 to completely agree=5). Therefore, score one was indicative of minimum tendencies while score five showed maximum positive tendencies toward reflective thinking. The following scores are for one questionnaire; therefore, it should be multiplied by the number of questionnaires. The cut-off point of the questionnaire is, as follows: low score: 16, average score: 48 and high score: 80. In this regard, lower scores are indicative of low tendencies and vice versa.

B) Ekvall's creative climate scale: the main items of the Ekvall's scale (2013) are in line with assessing the creative climate (16). The final version of the tool contains 10 components and 55 items. In this scale, 8, 6, 6, 11, 6, 5, 4, 4, 3, and 2 items are allocated to the components of challenge, autonomy, support of ideas, confidence and trust, debate, conflict, risk-taking, giving ideas time, liveliness and dynamism, happiness and humor, respectively. The items are scored based on a five-point Likert scale, from completely disagree (score=1) to completely agree (score=5). In addition, the low, moderate and high scores of the questionnaire were estimated at 55, 165, and 275, respectively, where higher scores are indicative of maximum use of creative climate and vice versa. The scale's reliability was estimated at Cronbach's alpha of 0.85 (16). This variable was reported at 0.9 by Hosseini and Mahdipour. In addition, confirmatory factor analysis was performed to identify and confirm the factors measuring the creative educational climate. According to the results, all indexes had a favorable fit (27). After coordinating with the authorities at Qaen University of Medical Sciences, the researcher explained the study's objectives and methodology to students and obtained informed consent. In addition, the participants were ensured of the voluntary participation in the study and the confidentiality terms regarding their personal information (observance of codes 1, 5, 8, 10, and 17 approved by the National Ethics Committee in Medical Sciences Research). The completed questionnaires were returned by students, and data analysis was performed in SPSS version 22 using inferential statistics, independent t-test (to compare means), Pearson's correlation coefficient (to evaluate the relationship between the variables), variance analysis and multiple regression.

## Results

In this study, five out of 169 questionnaires were excluded from the research due to being incomplete. According to the results, 100 out of 164 students were female (60.6%) and 64 of the participants (39.3%) were male (Table 1). The descriptive indexes related to the variable of creative educational climate (mean and standard deviation) are presented in Table 2, according to which the highest and lowest means were related to components of challenge (27.54) and happiness and humor, respectively. In addition, the total mean of a creative educational climate was reported at 176.52. Descriptive indexes related to the variable of reflective thinking tendencies (mean and standard deviation) are listed in Table 3. According to the results, the highest and lowest means were related to the components of comprehension and normal action, respectively. Furthermore, the total mean of reflective thinking tendencies of students was estimated at 61.32. Pearson's correlation coefficient and multiple regression analysis were applied to evaluate the role of the creative educational climate in students' reflective thinking tendencies, and the results are presented in Table 4.

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Table 1: Demographic information of research subjects

| Variable | | N. | % |
|---|---|---|---|
| Gender | female | 100 | 60.60 |
| | male | 64 | 39.39 |
| Academic discipline | Emergency medicine | 35 | 21.95 |
| | surgery room | 53 | 32.32 |
| | Midwifery | 36 | 21.9 |
| | Nursing | 40 | 24.39 |
| Age | 17-25 | 66 | 40 |
| | 25-35 | 38 | 23.03 |
| | 35- 40 | 36 | 21.81 |
| | 40 & above | 3 | 1.81 |

Table 2: Descriptive indicators related to creative educational climate and its components

| Components | N. | Mean±SD |
|---|---|---|
| 1- Challenge | 164 | 27.8± 54.795 |
| 2- Autonomy | 164 | 21.4 ±14.599 |
| 3- Idea Support | 164 | 21.4 ±37.885 |
| 4- Confidence & Trust | 164 | 21.6 30.017± |
| 5- Debate | 164 | 23.6 ±11.099 |
| 6- Conflict | 164 | 16.5 ±46.002 |
| 7- Risk-Taking | 164 | 13.6 ±47.455 |
| 8- giving Ideas Time | 164 | 14.5 ±25.530 |
| 9- Happiness & Humor | 164 | 7.2 ±41.421 |
| 10- Vitality & Dynamism | 164 | 10.2 ±48.838 |
| 11- creative educational climate | 164 | 176.29 ±52673 |

Table 3: Descriptive indicators of reflective thinking tendencies and its components

| Variable | Components | N. | Mean±SD |
|---|---|---|---|
| reflective thinking tendencies | Normal Action | 164 | 14.2± 58.679 |
| | Thinking | 164 | 15.2± 87.440 |
| | Comprehension | 164 | 16.2± 10.552 |
| | Critical Thinking | 164 | 14.2 ±77.786 |
| | Reflective Thinking | 164 | 61.8 ±32.108 |

Table 4: Correlation matrix of components of creative educational climate and reflective thinking tendencies

| Components | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1- Challenge | 1 | | | | | | | | | | | |
| 2- Autonomy | **0.40 | 1 | | | | | | | | | | |
| 3- Idea Support | **0.59 | **0.59 | 1 | | | | | | | | | |
| 4- Trust | **0.36 | **0.38 | **0.45 | 1 | | | | | | | | |
| 5- Debate | **0.25 | **0.39 | **0.43 | **0.42 | 1 | | | | | | | |
| 6- Conflict | 0.10 | 0.13 | 0.09 | 0.06 | *0.15 | 1 | | | | | | |
| 7- Risk-Taking | 0.06 | **0.04 | 0.09 | *0.19 | 0.07 | **0.26 | 1 | | | | | |
| 8- giving Ideas Time | 0.13 | **0.29 | **0.21 | **0.23 | **0.34 | 0.13 | 0.07 | 1 | | | | |
| 9- Vitality | *0.20 | **0.23 | **0.28 | *0.16 | **0.39 | 0.11 | 0.05 | **0.35 | 1 | | | |
| 10- Happiness | **0.31 | **0.33 | **0.38 | **0.34 | **0.39 | -0.01 | 0.14 | **0.29 | | 1 | | |
| 11-educational climate | **0.64 | **0.66 | **0.74 | **0.66 | **0.65 | **0.34 | **0.33 | **0.52 | **0.47 | **0.55 | 1 | |
| 12- reflective thinking | **0.30 | **0.28 | **0.37 | *0.15 | **0.33 | *0.18 | 0.04 | *0.18 | **0.31 | **0.33 | **0.42 | 1 |

** Significant at level 0.01 * Significant at level 0.05

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According to the results, there was a significant, positive relationship between creative educational climate (components of challenge, autonomy, supporting ideas, confidence, and trust, debate, conflict, risk-taking, giving ideas time, happiness and humor) and reflective thinking tendencies. In this regard, the highest and lowest significant correlation with reflective thinking was related to supporting ideas (0.37) and confidence and trust component, respectively. In this study, we assessed the role of components of a creative educational climate in reflective thinking tendencies. Results obtained from multiple regression analyses are presented in Table 5, which shows the validation parameters of the model of reflective thinking tendencies as a function of variables predicting the creative educational climate.

According to the results, the model proposed anticipated 24.8% of the variance of students' reflective thinking tendencies. Given the significance of the amount of the model's parameter (P<0.000), the model presented had high statistical importance was able to anticipate reflective thinking tendencies as a function of variables predicting the creative educational climate properly (99% confidence level). The amounts of the regression coefficients of the model are presented in Table 6, according to which the components of supporting ideas, confidence and trust, conflict, and happiness and dynamism played a positive and facilitating role in the prediction of students' reflective thinking tendencies.

**Table 5: Analysis of the variance of model predicting the reflective thinking tendencies based on the components of creative educational climate**

| model | Sum of Squares | df | Mean Squares | F | P value | R | R2 | Durbin Watson |
|---|---|---|---|---|---|---|---|---|
| Regression | 2659.371 | 10 | 265.937 | | | | | |
| Residual | 8056.501 | 153 | 52.657 | 5.050 | 0.000 | 0.498 | 24.8 | 1.493 |
| Total | 10715.872 | 163 | | | | | | |

**Table 6: Coefficients of regression model predicting the reflective thinking tendencies based on the components of creative educational climate**

| model | Unstandardized Coefficients | Standardized Coefficients | | T | P value | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | B | SD | Beta | | | Variance Tolerance | Variance Inflation |
| (Constant) | 39.153 | 3.657 | | 10.707 | 0.000 | | |
| 1- Challenge | 0.111 | 0.083 | 0/121 | 1.349 | 0.179 | 0.611 | 1.636 |
| 2- Autonomy | 0.041 | 0.160 | 0.023 | 0.258 | 0.797 | 0.600 | 1.667 |
| 3- Idea Support | 0.295 | 0.173 | 0.178 | 1.708 | 0.03 | 0.452 | 2.211 |
| 4- Confidence & Trust | 0.145 | 0.116 | 0.108 | -1.258 | 0.04 | 0.668 | 1.497 |
| 5- Debate | 0.164 | 0.119 | 0.123 | 1.383 | 0.169 | 0.618 | 1.618 |
| 6- Conflict | 0.213 | 0.121 | 0.132 | 1.763 | 0.04 | 0.880 | 1.136 |
| 7- Risk-Taking | 0.014 | 0.096 | 0.011 | 0.483 | 0.882 | 0.844 | 1.185 |
| 8- giving Ideas Time | 0.009 | 0.116 | 0.006 | 0.075 | 0.940 | 0.789 | 1.267 |
| 9- Happiness & Humor | 0.449 | 0.282 | 0.134 | 0.594 | 0.113 | 0.695 | 1.438 |
| 10- Vitality & dynamism | 0.449 | 0.232 | 0.157 | 0.934 | 0.045 | 0.744 | 1.344 |

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In this research, independent t-test was applied to evaluate the difference between male and female students in terms of reflective thinking tendencies(Table 7). Consuming equal variances for all components (based on Levene's test), this test was carried out to compare male and female students regarding reflective thinking and its components. According to the results, there was no significant difference between male and female students regarding reflective thinking tendencies and components.

**Table 7: T-test results of independent samples (Comparison of reflective thinking tendencies of male &s female students)**

| Components | Levene's Test | | T-Test | | | | | |
|---|---|---|---|---|---|---|---|---|
| | F | P value | T | df | P value | Mean Difference | Mean | |
| | | | | | | | female | male |
| **Reflective Thinking** | 0.249 | 0.618 | 0.711 | 162 | 0.478 | 0.942 | 61.34 | 62.28 |
| **Normal Action** | 0.434 | 0.511 | 1.364 | 162 | 0.175 | 0.635 | 14.41 | 15.05 |
| **Thinking** | 0.150 | 0.699 | 0.288 | 162 | 0.774 | 0.111 | 15.94 | 16.05 |
| **Comprehension** | 1.470 | 0.277 | 1.093 | 162 | 0.276 | 0.451 | 16.05 | 16.50 |
| **Critical Thinking** | 0.027 | 0.870 | 0.538 | 162 | 0.591 | 0.256 | 14.94 | 14.68 |

## Discussion

In the current research, there was a significant, positive relationship between the components of creative educational climate and reflective thinking tendencies. In addition, the regression analysis results demonstrated that a creative educational climate plays a facilitating role in students' reflective thinking tendencies. In this regard, our findings are in line with the results obtained by Rees (28), Papadimos (29), Haghani et al. (30), Mohebi Amin et al. (16), Navidi & Toyserkani Ravari (31), and Bagheri et al. (6). Reviews of existing literature show that there is a correlation between the variables of classroom climate, the goals of progress, reflective thinking, and appropriate academic performance. The psychological and social climate of the classroom facilitates reflective thinking. Students following dominant goals show a form of the inherent tendency toward critical thinking, analysis, and understanding (32).

In this regard, our findings are in line with the results obtained by Young, who emphasized the importance of the relationship between educational climate and classroom atmosphere and reflective thinking (33). Papadimos suggested that the concept of reflective thinking be facilitated and taught by instructors and teachers. Dewey's explanation that reflective thinking must be taught and insisted on is very applicable in the medical school atmosphere (29). In this respect, the results obtained by Rees demonstrated that reflective actions enabled last-year nursing students to properly respond to upsetting and emotional challenges (28). Meanwhile, the reflective act is a skill that can be flourished through the formation and implementation of an educational program (6). In a research entitled reflective teaching-learning, the goal of reflection is not just to develop skills and awareness and includes being accustomed to thinking and strengthening of mental mechanisms to produce information and critical learning (30).

One of the challenges of instructors is creating situations in which students of different professions work together and solutions are required to improve interprofessional relations to establish cooperation and creative thinking. By doing so, a type of care can be provided that is not limited to traditional professional and service boundaries. The application

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of reflective processes lays the foundation for the development of interprofessional relations in students with other professions (34). According to the results obtained by Bagheri et al., reflective practice is an educational tool that can provide a platform for developing the critical skills of critical thinking, self-awareness, professional development, and self-direction. The use of such reflective processes allows students to move from a passive role to a more active role in learning, and more importantly, lead to attention to the patient as the main center of care (6).

In fact, reflective thinking is critical thinking and the necessity for a successful medical action. One of the problems with reflective thinking is the lack of research on its use in medical education (29). According to the results obtained from the independent t-test, no significant difference was observed between male and female students in terms of reflective thinking tendencies. In this regard, our findings are inconsistent with the results obtained by Kianinejhad, who demonstrated that gender affected students' critical thinking in a way that female students had a higher tendency, compared to male participants (35). Therefore, further discussion in this regard requires more research and the use of similar valid tools, as well as the generalization of results to other statistical communities to examine the differences between the two groups.

According to their results, Mohebi Amin et al. recommended that novel teaching strategies and creative teaching styles be used by professors to improve the teaching process (16). The application of the goldfish bowl technique was recommended in a research by Shirazi et al. to strengthen creative thinking in medical students (36). Students' thinking abilities are enhanced by their skills in clear and logical thinking since these skills can improve their academic performance and success in life. Thinking skills are influenced by scientific attitudes, which refer to a way of thinking without prejudice (37).

Research related to educational environments is one of the most important studies in medical universities (18). In a research by Sanagoo et al., the educational climate of the university was reported favorable by most students (25). In another study, Mousazadeh et al. concluded that proper techniques must be used in training students with reflective thinking tendencies so that they could develop this type of thinking in the provision of high-quality care (11). It is important to promote students' creative thinking with new techniques in order to foster innovation in the desired educational environment (36). Reviews of research studies have shown that open and free classroom space is conducive to the growth of research, curiosity, manipulation, self-discipline, and learning. In addition, open and free communication was reported to be leading to the breakdown of hierarchical structures, which results in greater risk and ultimately increased creativity (16).

According to the results obtained by Smith et al., reflective writing as a component of a cartable shows evidence of skill development and increased clinical competence. Moreover, the results are indicative of the positive effect of reflection on more capable students to more significantly using this approach with higher tendencies (38). When medical students become physicians, they can also apply their thinking skills to problems outside of the patient's case. They can contribute to the person's welfare by asking an effective question that opens dialogue (29). Every year, a huge budget is dedicated to training programs. In order to maximize and invest in education, not only managers but all people working in the system should be concerned about the process of training. Concluding about the cause is difficult in the present study due to the use of a descriptive and correlational method. On the other hand, more accurate results can be obtained by designing the study in a longitudinal way. In addition, the generalization of the results is limited due to the small sample size. With regard to the main question of the research, the results demonstrated that creative teaching climate played a facilitating role in students' reflective thinking tendencies. Therefore, establishing a creative educational climate could be beneficial for improving thinking and concentration and increasing reflective thinking tendencies. It is suggested that the components of a creative

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educational climate be considered by professors to increase students' participation in discussions, thereby playing an important role in the use of reflective thinking tendencies.

## Conclusion

According to the results of the present study, providing a creative educational climate can challenge students' thinking and lead to discussion and question and answer, providing an opportunity for students to use their creative idea tools. As such, it is recommended that the development of reflective thinking be facilitated in creative educational environments. Therefore, in order to apply the results, with special attention to student opinions, it is suggested that special attention be paid to asking high-level questions by professors, participating in analyzing topics and presenting different ideas and opinions, using active individual and group learning strategies, and using follow-up tests by professors to assess students' high levels of cognition. It is suggested that the modifying role of variables such as gender and parental level of education in the effectiveness of a creative educational climate on reflective and critical thinking of students be assessed as well. Furthermore, it is recommended that the role of factors such as the social-cultural status of universities in different regions and the economic and family status of professors in the improvement of reflective and critical thinking tendencies of students be evaluated in future studies.

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