

## The Achievement Motivation in Students: The Role of Basic Psychological Needs and Critical Thinking

### Abstract

This study examines the relationship between basic psychological needs, critical thinking, and motivation for achievement among students in Islamic Azad University, Mashhad Unit, in the academic year 2021-2022. The research method is descriptive of the correlation type, and data was collected using The Hermans Achievement Motivation Questionnaire, Watson-Glaser Critical Thinking Questionnaire, and Guardia et al. Basic Psychological Needs Questionnaire. Results reveal a positive and significant relationship between achievement motivation and basic psychological needs, as well as critical thinking in the dimension of identifying assumptions. However, no significant relationship was found between achievement motivation and other dimensions of critical thinking. Basic psychological needs and identifying assumptions were found to account for 39 percent of the variance of achievement motivation. These findings suggest that basic psychological needs and critical thinking in the dimension of identifying assumptions play an important role in motivation for achievement among students.

**Keywords:** *Self-governing, Merit, Relationship, Critical thinking, Achievement motivation*

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### Introduction

Education institution in any country has numerous subcategories, out of which higher education is thought of as one of the major subcategories (Pourkarimi and Mobin Rahni, 2018). To improve the quality of higher education institutions, successful education, and providing psychological, social, and physical health for students which is among the basic goals of education planners in any country (Brückner, S, et al., 2015), and to avoid problems like an academic failure, some factors need to come into play, so they can bring the highest productivity for their society. One of these factors is motivation (Chen, 2022). Motivation is one of the major topics in higher education and one of the parameters at play in increasing the efficacy of this institution (Muenks, Yang, & Wigfield, 2018). Motivation includes conditions that add strength to behavior and identifies its direction and route (Atkinson et al., 2000). Moreover, Motivation is used to refer to stimulating someone to do something, and in the educational context, it is viewed as one of the essential factors for educational effectiveness and learning (Leitão, Maguire, Turner, & Guimarães, 2022; Çakiroğlu et al., 2017; Dichev, 7 Dicheva, 2017; Lawlor, Marshall, & Tangney, 2016).

Motivational structure is an effective factor in the formation of social and structural changes and evolutions (Mohammadpour et al., 2020). Many people, students, in particular, need the motivation to continue their academic career, a motivation that could assist and energize them throughout their career and probably in encountering problems. This need is the need for achievement, which scholars have pointed out for many years as a major parameter in the taking of the steps of success (Noee, Kheir, Soltanali, & Sohrabi Shegefti, 2020). The need for achievement is one of the first motives that has been studied in detail (Smith et al., 2021). Studies regarding achievement motivation could be traced back to the investigation by Muray

(1938). Muray defined the basic needs of individuals for progress as a motivation for overcoming obstacles, creating strength, and dedication to challenging work as soon as possible (Ran, 2022). When a person is motivated to succeed, he expects to achieve positive results. Also, when he is motivated to avoid failure, he expects negative outcomes, the sum of which is called motivation (Brunstein, & Maier, 2022). Achievement motivation is considered to be a basic asset for any person wishing to realize his dreams (Sari, 2018). Those with high achievement motivation tend to put themselves in a situation where they can experience more satisfaction, success, and vivacity in life (Pahljina- Reinić & Kolić-Vehovec, 2017). In addition to Muray's theory, the theory of value expectation by Eccles about achievement motivation is regarded as one of the most influential theories on learning motivation, job selection, and developing a self-concept related to progress (Eccles, & Wigfield; Wigfield, & Eccles, 2000). This theory states that if people highly value the thing that they want to do, the possibility of selecting it and the attempt to achieve desired results increases (Moeller, Viljaranta, Tolvanen, Kracke, & Dietrich, 2022).

One of the other major motivational variables in the form of self-determination theory is basic psychological needs (Nimick & Rian, 2009). Recently, new approaches in motivation psychology maintain that human beings are active and interested in learning and internalizing/living environment values. This intuitive propensity for learning has been stated in self-determination theory (Kabiri, Arabzadeh, & Gasemi Asl, 2018). This theory is one of the new theories on personality and motivation, which, in addition to applying conventional methods, has highlighted the significance of internal resources developed in humans in the growth and excellence of personality and behavioral self-regulation of people (Ryan, & Deci, 2017), and clarifies individual's basic psychological needs (Ümmet, 2015).

Self-determination theory is an empirical one built upon human motivation, evolution, and health. This theory focuses on various kinds of motivation, pays special attention to self-governed motivation, controlled motivation, and the lack of motivation, and views them as the predictor of function, relationship, and well-being (Moradbakhti, Schreiberlmayr, & Mara, 2022). In this theory, it was found that basic psychological needs influence the kind and strength of motivation, as well as underlying issues such as goals, human psychological needs, self-regulation, life desires, the relationship between culture and motivation, and the effects that the social environment has on people's emotions, behavior and motivation (Pourhosein, Ehasani, Ensani Mehr, & Nabizadeh, 2018). Basic psychological needs are thought of as energy necessary for active involvement with the environment, healthy growth, and developing skills. These basic psychological needs, present in all people and essential for them, are as follows: the need for self-governing, communication, and merit (Deci & Ryan, 2011). The need for self-governing refers to the need for autonomy, the right to choose, the freedom to make decisions, and the independence to perform tasks and actions. Self-governing happens when the individual feels that he is the reason for his behavior, i.e., that he has chosen an activity of his own free will and can act based on his standards (Carreira, 2012). The need for merit comes as a result of effective communication with the environment, the proclivity to use skills and capabilities, following challenges, assignments in line with abilities, coping with them, and achieving a sense of control. Finally, the need for communication refers to the need to feel confident when building relationships with others, the need to be accepted as a worthy person, to receive love and respect from others, and a sense of belonging in the university, and the presence of signs of motivation, involvement in activities and adaptability (Skinner, & Pitzer, 2012). Moreover, self-determination theory holds the view that environmental support will help satisfy basic needs, and these needs also strengthen and facilitate self-regulation of motivation (Chen, & Jang, 2017). Accordingly, the feeling of satisfaction with the fulfillment of basic psychological needs has a direct effect on internal motivation (Heydari, Gorbani, & Pourhosein, 2018). Fulfilling these three basic needs is essential for human growth, promotion, and development, sense of self-confidence, and self-esteem; in contrast, when people fail to meet these needs, incompatibility takes place, and the person will have a fragile, negative, alienated and critical perception of himself, as described by psychopathology (Chen, & Jang, 2010; Vansteenkiste, & Ryan, 2013).

One other variable that affects achievement motivation is critical thinking. Regarding the effect of critical thinking on achievement motivation, studies suggest that this talent would

have an effect on achievement motivation, and critical thinking is the predictor of achievement motivation and has all the components of critical thinking like assessment, induction, deduction, analysis, and inference, have significant correlation with achievement motivation (Khadem Sadegh, Omidvar, & Jalilipour, 2018). Critical thinking is one of the major principles of education in any country, and any country needs people with strong critical thinking to achieve growth and prosperity (Sajedi Rad, Jahani, Shafiee Sarvestani, & Mohammadi, 2021). In a study conducted by Ccedil (2011), in an attempt to analyze the relationship between achievement-focused motivation and critical thinking, it was found that critical thinking is a major tool for predicting achievement-focused motivation. In this context, they suggested that the development of critical thinking skills should also be considered when teaching achievement-focused motivation to students. Critical thinking, as a higher-order thinking, has been regarded as a planned educational accomplishment in 2050 (UNESCO, 2022) and, when effectively taught, could help solve many problems logically (Dwyer, Hogan, & Stewart, 2011). When properly used, this kind of thinking could contribute to improving higher education institutions and the labor market (Liu, & Pásztor, 2022). Therefore, developing critical thinking skills to create responsible citizens, who can reflect on and evaluate the huge amount of available information, is essential (Behar-Horenstein, & Niu, 2011) and has become a key goal in higher education (Liyanage, Walker, & Shkouhi, 2021). However, presenting a standard definition of critical thinking is challenging due to the complexity of this thinking as a psychological structure (Liu, & Pásztor, 2022). However, different definitions draw similar far-reaching dimensions. Critical thinking, for example, is related to reasoned, reflective thinking aimed at making decisions about what to believe or what to do (Ennis, 2011) or to the assessment capacity of statements (Lawson, 1999). Critical thinking is used for problem-solving, inference, and decision-making (Butler, 2012). Facione (2011) enumerates four elements in describing critical people: maturity in judgment, open-mindedness, curiosity, searching for facts, confidence in one's ability to think critically, systematization and analysis. Furthermore, the motivation for high development, the tendency for beauty, great feeling, extensive knowledge, perseverance and discipline in work, great interest in order, independence, and intuitive thinking are the characteristics of critical people.

Despite the intricacies that exist in defining critical thinking, most researchers agree that this kind of thinking depends on skills and inclinations (Elder, & Paul, 2020; Enis, 2011). The agreed-upon definition of this type of thinking is that it encompasses both the skill and the tendency dimension (Sosu, 2013; Facione, Sanchez, Facione, & Gainen, 1995). The

dimension of critical thinking skill is used to refer to the ability to understand issues and create reasoned solutions through analysis, interpretation, and conclusions (Sosu, 2013; Chan, 2019). The tendency dimension is used to refer to the propensity to employ these skills when there is a problem to solve or decide about (Facione et al., 1995). Above all, critical thinking is unlikely to be applied in practice without a strong desire to do so (Chen, Liu, Zhu, & Tang, 2020).

Critical thinking has different effects on achievement motivation and the educational performance of students, and the integral role of achievement motivation in learners' educational performance should not be ignored (Khadem Sadegh, Omidvar, Omidvar, & Jalilipour, 2018). Also, Ryan and Deci (2017) argue that a learning environment that relies on independence features could affect critical thinking, and these environments are grounded on the self-determination theory. Astuti, Sumantri, and Boeriswati (2018) examined the relationship between achievement motivation and critical thinking, and reading ability and found that there is a positive and significant relationship between achievement motivation and critical thinking along with reading comprehension ability. Thus, according to what was discussed, and given the wide range of topics that this research deals with, and the effects that these variables would have on the lives of students in line with their growth and development, and of course, the society where they live, and also identifying impediments that could hinder academic progress in students, the present research assumes greater importance. Therefore, acknowledging the above, the current research aims to investigate the role of basic psychological needs and critical thinking in students' achievement motivation.

## Methodology

The current research method is descriptive of correlation type. The statistical population studied in this research was all the students of Islamic Azad University, Mashhad Unit, in the academic year 2021-2022. The sample group under study was a total of 200 students, who were selected by a simple random sampling method. This was done by going to different faculties of the university (basic sciences, educational sciences, engineering, law, and language), randomly distributing a questionnaire on critical thinking, achievement motivation, and basic psychological needs among students of faculties, and collecting primary information. The criteria for entering into the study were: being a student, not having a mental disorder (according to self-report by student), and giving consent for participating in the research. The criteria for leaving the research were: subjects who have graduated and reluctance to participate in the research. To conduct this research, first, the required tools were prepared, and then the sampling process was implemented, followed by the researcher distributing the

questionnaires, and their completion by students under the supervision of the researcher, after going to the university and explaining the goal of the research, and securing the students' cooperation, and providing additional explanations. There was no time limit for responding to the scales, so students could fill out the questionnaires in a sufficient while. Also, a written informed consent form was obtained for all the research samples. Ethical considerations in this research involved obtaining permission from relevant authorities, introducing oneself to the research subjects, explaining the goals and nature of the research, presenting the findings upon the subject's request, and at last, the students were assured that their personal information would remain confidential. The required data were extracted and analyzed by Pearson's correlation coefficient method and simultaneous regression analysis using SPSS software.

## Measurement tool

**1. Basic psychological needs scale:** 1. This scale was created by Guardia, Desi, and Ryan in 2000, which measures the extent of the feeling of support for self-governing, merit, and communication with other subjects. The above scale has 21 substances and measures the following components: self-governing subscale (1-4-8-11-14-17-20), merit subscale (3-5-10-13-15-19), and communication subscale (2-6-7-9-12-16-18-21). The scoring method is based on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), and the questions (3-4-7-11-15-16-18-19-20) have a reverse score. Wei et al. (2005) have reported the credit required for self-governing, merit, communication, and the total score scale to be 0.68, 0.75, 0.85, and 0.90. Also, Ezhei et al. (2008) have reported Cronbach alpha for the total scale and the subscales of self-governing, merit, and communication to be 0.83, 0.68, 0.74, and 0.66, and their validity was supported using confirmatory factor analysis. In the present study, the reliability coefficient using the Cronbach alpha method was found to be 0.82, 0.79, 0.81, and 0.85 for the subscales of self-governing, merit, communication, and the total scale, respectively.

## 2. Critical thinking scale

A critical thinking test was made by Watson-Glaser in 1998 (cited in Bijvand, Sobhani Nejad, Nik Azin, & Mohammadi Pouya, 2014). This test was meant for measuring critical thinking (Asgari & Maleki, 2010) and is a tool that can measure the subject's critical thinking using 80 general questions in five sections of skills (inference, the recognition of assumptions, deduction, interpretation, the evaluation of logical arguments) (Asgari, & Maleki, 2010). Each one of the above sections includes 16 questions. The total score of the test is 80, and the score obtained from each section could vary from 0 to 16. Each of the subjects, according to the total points obtained from the test, could fall into one of the categories of

weak (score below 54), medium (score between 54-59), and strong (score between 60-80) in terms of critical thinking ability (Bijvand et al., 2014). The researchers conducted abroad have reported its reliability to be somewhere between 0.81 and 0.91, in addition to supporting the validity of the scale construct using confirmatory and exploratory factor analysis (Bernard et al., 2008; Possin, 2014). In a study to investigate the psychological features of Watson-Glaser's critical thinking test and its relation to creativity, Kaviani Mehr, Salimi, & Liafat (2015) reported the reliability coefficients of the scale for the total test to be 0.74 and its components to be between 0.63 and 0.71, in addition to supporting the construct validity and its five-factor construct using exploratory factor analysis. In this study, the reliability coefficient was found to be 0.81, 0.78, 0.83, 0.76, 0.89, and 0.92 for the subscales of inference, recognition of assumptions, deduction, interpretation, evaluation of logical arguments, and the total scale, respectively.

### 3. Achievement motivation scale

This questionnaire was developed by Hermans (1970). It includes 29 questions and comprises 10 dimensions (tension, assignment, the level of desire, perception of time, recognition behavior, friend selection, achievement behavior, upward mobility, risky behavior, perspective on time, and resistance). Some of the questions have been presented as positive, and

Table. 1 descriptive indicator of predictor variables and research criteria

	Variable	M±SD	Skewness	Kurtosis	Minimum	Maximum
<b>Basic needs</b>	Self-governing	38.48±6.67	-0.37	-0.55	20	49
	Merit	32.37±6.43	-0.32	-0.47	12	42
	Communication	44.02±6.23	-0.55	-0.80	28	56
<b>Critical thinking</b>	Inference	5.34±2.30	0.15	-1.37	0	12
	Recognition of assumptions	10.51±2.10	0.11	-0.44	4	14
	Deduction	8.64±2.46	0.46	0.35	4	13
	Interpretation	9.95±2.63	-0.11	0.43	4	24
	Evaluation of logical arguments	9.03±2.45	-0.05	-0.34	0	15
	<b>Achievement motivation</b>	84.29±7.74	-0.52	-0.27	62	104

According to the information in the table, out of the basic needs, the need for communication has the highest average (40.00), and out of the components of critical thinking, the average of the component of recognition of assumptions (14.01) is higher than others. The average achievement

some as negative. In questions (1-4-9-10-14-15-16-20-23-27-28-29), 1 point, 2 points, 3 points, and 4 points are given to a, b, c, and d, respectively. In the rest of the questions, the scoring is reversed. The range of changes in scores varies from 29 to 116 (Zare, 2016). This questionnaire is used to measure the achievement level of subjects. Scores above average suggest the presence of high achievement motivation in the individual, and scores lower than average, indicate low achievement motivation. The validity of this scale was found to be 0.84 and 0.82 using Cronbach alpha and retesting, respectively (Hermans, 1970). Also, the validity of this questionnaire was found to be 0.74 and 0.68 using Cronbach alpha and retesting, respectively (Akbari, 2007). In this research, the Cronbach alpha of this questionnaire was found to be 0.86.

### Findings

The average age group of research subjects was between 14 to 25, with a standard deviation of 3.68. In terms of faculty, 25 people were students of basic science faculty (12.5%), 68 of educational science faculty (34%), 30 of technical and engineering faculty (15%), 42 of law faculty (21%), and 35 of languages faculty (17.5%).

Table. 1 presents the descriptive finding of predictor variables and research criteria.

motivation variable is also 84.29. Considering that the skewness and kurtosis indicators fall into the  $\pm 2$  range, it suggests that the data distribution is normal.

Table 2. shows the correlation matrix of research variables.

Table 2. The summary of the correlation matrix results between basic psychological needs as well as critical thinking and achievement motivation

Variable	1	2	3	4	5	6	7	8	9
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1. <b>Self-governing</b>	1								
2. <b>Merit</b>	**0.21	1							
3. <b>Communication</b>	*0.16	**0.37	1						
4. <b>Inference</b>	*0.24	**0.25	*0.12	1					
5. <b>Recognition of assumptions</b>	**0.27	**0.31	**0.33	**0.38	1				
6. <b>Deduction</b>	**0.29	*0.25	0.16	**0.37	**0.41	1			
7. <b>Interpretation</b>	0.11	*0.28	*0.23	**0.31	0.19	**0.41	1		
8. <b>Evaluation of logical arguments</b>	*0.31	0.04	0.13	**0.32	**0.41	*0.28	*0.19	1	
9. <b>Achievement motivation</b>	**0.38	**0.36	**0.42	0.08	*0.14	0.04	0.12	0.10	1

\*\*P<0.01      \*P<0.05

According to the data presented in the table, there is a positive and significant relationship between basic needs of self-governing, merit, communication, and achievement motivation ( $p<0.01$ ). Also, there is a positive and significant relationship between the component of recognition of assumptions and achievement motivation ( $p<0.05$ ). However, there is no significant relationship between the components of critical thinking (inference, deduction, interpretation, evaluation of logical arguments) and achievement motivation ( $p>0.05$ ).

To assess the assumption of collinearity of the variance inflation factor (VIF) and tolerance coefficient and to test the independence of errors among predictor variables, the Durbin-Watson index value (collinearity) was adopted. Table 3. Shows variance inflation, tolerance coefficient, and Durbin-Watson statistics of research variables.

Table 3. tolerance coefficient and variance inflation as well as Durbin-Watson index of research variables

Research variables	Tolerance coefficient	Variance inflation	Durbin-Watson
<b>Self-governing</b>	0.856	1.16	1.24
<b>Merit</b>	0.518	1.93	
<b>Communication</b>	0.554	1.80	
<b>Inference</b>	0.619	1.61	
<b>Recognition of assumptions</b>	0.945	1.05	
<b>Deduction</b>	0.838	1.19	
<b>Interpretation</b>	0.856	1.16	
<b>Evaluation of logical arguments</b>	0.756	1.12	
<b>Achievement motivation</b>	Criterion variable	Criterion variable	Criterion variable

According to the data given in the table, the indices of tolerance coefficient and variance inflation of the research variables are greater than 0.1 and smaller than 10, respectively. This suggests that the collinearity phenomenon is not present in research variables. To test the independence of the errors

among the predictor variables, the value of Durbin-Watson's index was investigated; the value of the above index was 1.24, which was confirmed as it was lower than 2.

The results of multiple regression analysis using the simultaneous method are presented in Table 4.

Table 4. the results of simultaneous regression analysis to predict achievement motivation based on psychological needs and critical thinking

Model	Non-standard coefficient	Standardized coefficient	t	Significance level	r <sup>2</sup>	
	Beta	Standard error	Beta			
<b>Constant</b>	62.21	18.05	-	3.44	0.001	0.39
<b>Self-governing</b>	5.78	2.85	0.224	2.03	0.02	
<b>Merit</b>	4.05	2.96	0.116	1.03	0.03	
<b>Communication</b>	5.78	2.85	0.224	2.03	0.01	
<b>Inference</b>	1.05	2.96	0.116	1.03	0.306	
<b>Recognition of assumptions</b>	2.58	0.34	0.449	1.21	0.04	
<b>Deduction</b>	0.10	0.011	0.002	12.30	0.103	
<b>Interpretation</b>	3.98	2.84	0.157	1.05	0.165	
<b>Evaluation of logical arguments</b>	3.98	2.84	0.157	1.04	0.165	

According to the data in the table, basic psychological needs and the component of recognition of assumptions positively and significantly predict the variable of achievement motivation ( $p < 0.05$ ), however, other components of critical thinking such as inference, deduction, interpretation, evaluation of logical arguments, could not significantly predict achievement motivation among students. Also, based on the coefficient of determination, these variables generally represent 39% of the variance of academic achievement. Therefore, the regression equation is written as follows:

$$\text{Achievement motivation} = 62.21 - 5.78 (\text{self-governing}) + 4.05 (\text{merit}) + 5.78 (\text{communication}) + 2.58 (\text{recognition of assumptions})$$

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**Conflict of Interest:**

None

**Conclusion**

This research mainly attempted to investigate the effect that basic psychological needs and critical thinking may have on achievement motivation among the students of Islamic Azad University, Mashhad Unit, in 2021-2022. Data analysis suggested that there is a positive and significant relationship between basic psychological needs and achievement motivation among students, and these three needs significantly predict achievement motivation in students. These results are in agreement with the findings of Daniels and Dueck (2022), Kingsford-Smith and Evans (2021), Pelikan et al. (2021), Chen, Elliott, and Sheldon (2019), and Kusurkar Ten Cate, Van Aspersen, and Croiset (2011). In the research conducted by Chen et al. (2019) to investigate the mediating role of

achievement goals in psychological needs, by combining self-determination theory and goal approach, it was found that these two theories together would support achievement motivation, internal motivation, independence, and merit. According to self-determination theory, experiencing the perception of self-governing would facilitate merit, and intrinsic motivation relationships, and any phenomenon that fulfills the basic needs of people, could help increase self-determining motivation. In contrast, conditions that impede the development of self-governing, communication, and merit prevent self-determining motivation. (Gholamali Lavasani, Khezriazar, Salehnajafi, & Maleki, 2017). In self-determination theory, the more independence and merit needs are satisfied, and the less pressure or tension is perceived, the more likely the emergence of things that would intrinsically affect achievement motivation (Schürmann & Quaiser-Paul, 2022).

**Discussion**

In explaining this finding, it could be recognized that the more students have a sense of merit, self-governing, and communication, the more intrinsic motivation they feel for success, and they will feel bound to step up their effort and motivation to obtain these basic needs, so they can achieve their goals. Also, these components would make students perform better and stronger concerning learning and so clear the way towards their progress and success. Therefore, it can be stated that those students who use internal motivation to understand the need for self-governing, merit, and communication are stronger people (Mohammadi, Erfani, and Mohagheghi, 2017).

In an investigation conducted by Pourhossein et al. (2018), who examined the relationship between the fulfillment of basic psychological needs and the mediating role of achievement motivation, they found that basic psychological needs and the variable of achievement motivation are intertwined. This

finding is in accord with the findings of the present research and the basic assumption of self-determination theory, in which three components of self-determination, i.e., merit, communication, and self-governing, are essential for achievement (Niemic & Ryan, 2009). According to the self-determination theory, the fulfillment of basic psychological needs is associated with academic involvement and positive learning results; however, failure to fulfill these basic needs is associated with a lack of involvement in academic assignments and, as a result, poor learning outcomes. When the class structure supports the fulfillment of these needs, students will feel self-determined and intrinsically motivated. However, when these basic needs are not satisfied, students will feel controlled and extrinsically motivated. Therefore, they will be less motivated to succeed, and principally they will not succeed academically as one of the criteria of success. However, students whose psychological needs are met perform better in terms of academic achievement (Gholamali Lavasani, Khezri Azar, Amani, and Alizadeh, 2011). In explaining this finding, it could be argued that one of the factors that make students feel better about this phase of life is that they see themselves progressing in various aspects, such as personality and education, and as a rule, if a student is motivated to progress, and this motivation is intrinsically supported and is accompanied by success in education and the development of one's personality traits, it gives the individual a sense of success and considering that this path is taken from inside, it could protect the motivation, and fulfillment of a person's basic needs from psychological injuries, which is one of the major problems at this stage of life. In general, it could be claimed that just as the physiological needs of each person must be satisfied, the basic psychological needs must also be satisfied, so people can have a healthier life (Turja, Särkikoski, Koistinen, Melin, 2022).

According to self-determination theory (Ryan and Deci, 2000; Ryan and Deci, 2017), three basic psychological needs, i.e., self-governing, communication, and merit, are interdependent, and these needs must be fulfilled so that a person can give impressive performance and reach prosperity (Ilkka, Savolainen, Hagfors, & Oksanen, 2022). This finding indicates that the need for merit is related to the feeling of being effective in actions and interactions with social environments (Karkkola et al., 2018). During the academic period, when studying and the student's ability level are aligned, studying will become an inducement for the student to challenge himself, and this makes the student feel competent and gear himself up for success and achievement. Furthermore, through studying, the student can, by achievement in the university, establish communication with others more widely and with more respect, and in so doing, he can get the feeling of being helpful and effective in himself. The need for self-governing also

refers to a source of perceived internal control and a sense of agency (Pelikan et al., 2021).

The theory of self-determination maintains that the fulfillment of each one of these three basic psychological needs uniquely contributes to intrinsic motivation. In this regard, Martinek et al. (2021) found that satisfaction with self-governing has a positive, and frustration with self-governing has a negative relationship with internal motivation in students. Students who feel more autonomous have more proper strategies for metacognitive self-regulation, critical thinking, and organization. The presence of these components will usually be a good contributor to students' achievement motivation, and as a crucial factor, it affects human behavior and performance (Turan, 2015). These three self-determination needs play an influential role in cultures and environments (Chen et al., 2015; Vansteenkiste, Ryan, & Soenens, 2020) and act as essential psychological substances to create high-quality motivation (Ryan and Deci, 2017). To perform a high-quality action, students typically need communication as one of the three basic psychological needs. Communication itself refers to the feeling of connection with others and the individual's belonging to the society, and understanding this component entails that the individual feels that he is significant in the events and issues around him and that others also understand his role in these topics and respect him. Communication is a major motivational structure because when interpersonal relationships support people's need for a sense of belonging, they perform assigned tasks better, are more flexible in the face of problems and stress, suffer fewer psychological problems (Hijazi, Salehi Najafi, & Amani, 1979), and they will enjoy a higher achievement motivation to fulfill their goals and dreams, and establish a warmer relationship with the people in their environment, while the disappointment of the relationship indicates a feeling of solitude and rejection (Deci and Ryan, 2000; Ryan and Deci, 2017), and it can act as an important obstacle in achieving goals and dreams that even students with high achievement motivation, have set for themselves. Therefore, it could be argued that, according to self-determination theory, experiencing the perception of self-governing, merit, and communication, and the relation that these three components have with motivation, would facilitate achievement motivation and any event that can fulfill the basic psychological needs of students, leads up to increased achievement motivation. In contrast, any factor that may prevent students from achieving their basic psychological needs suppresses students' achievement motivation, and in principle, the authorities should think of solutions in this regard.

Another finding of this research reflected that there is a positive and significant relationship between achievement motivation and critical thinking in the dimension of the

recognition of assumptions. Out of the components of critical thinking, only the dimension of the recognition assumptions significantly predicts achievement motivation. This finding is in accord with the research done by Khadim Sadegh et al. (2018) and in part with the study carried out by Ccedil (2011). In a study carried out by Khadem Sadegh et al. (2018), it was found that critical thinking has a positive and significant relationship with achievement motivation, and all five components of critical thinking can predict achievement motivation. Also, Ccedil (2011), in a study that set out to investigate the relationship between achievement-focused motivation and critical thinking, it was found that critical thinking is a major tool for predicting achievement motivation. In explaining this finding, it could be acknowledged that because Iranian society culturally and religiously holds the view that the universe has a series of laws, the phenomena happening around us are not random, these events are systematic and scientific rules hold about them, and no event is without cause, because of these beliefs, students have more critical thinking in this regard, and their internal motivation to understand these concepts, is higher than other dimensions in critical thinking. It could also be argued that students who are better at critical thinking in the dimension of recognition of assumptions have a higher achievement motivation and try to be very diligent in solving problems and achieving success (Slavin, 2019). Considering that they try to solve problems for themselves based on rules, scientific rules, and assumptions themselves, they feel more motivated to achieve and believe that they have control over their lives and can enjoy it. Moreover, these people try to improve their performance and do things that are challenging, and assessing their achievement could be possible (Tokrald, 2000).

There is no significant relationship in other dimensions of critical thinking, i.e., the dimensions of inference, deduction, interpretation, evaluation of logical arguments, and achievement motivation. This finding is consistent with the research carried out by Rahayu, Tolla, and Syukur (2022) and in some dimensions with Mastbergen's research (2012). In a study investigating the effect of critical thinking and learning attitude on the students' achievement motivation in mathematics, Rahayu, Tolla, and Syukur (2022) found that critical thinking hardly has a positive effect on achievement motivation in mathematics. In explaining this finding, it could be maintained that the lack of a strong relationship between some components of critical thinking and achievement motivation is rooted in the inconsistency of current educational patterns in the culture, which means that these patterns are not consistent with a single goal. Also, regarding the explanation of the lack of relationship between achievement motivation and the dimensions of inference, deduction, interpretation, and evaluation of logical arguments as dimensions of critical

thinking, we would refer to the extent of internal and external motivation. It seems that external motivations are more effective than internal motivations in students, and so students do not know how to use these dimensions of critical thinking for achievement motivation, and they try to examine issues superficially and externally.

In a study that set out to examine achievement motivation and critical thinking, Mastbergen (2010) found that although rigorous research has been carried out on achievement motivation and critical thinking, very little is known about the relationship between these two variables, and in his research. It was found that there is no significant relationship between the dimensions of achievement motivation, i.e., mastery, work, and critical thinking, but there is a positive correlation between the ability to think critically and the dimension of competitiveness in achievement motivation. In explaining the results of this hypothesis, it could be stated that the educational system and parents, without considering the maxim of thought-centeredness in education, encourage and force their children to choose the best jobs and academic subjects that are socially acceptable so that their self-esteem of people becomes dependent on these achievements. Thus, to prevent mental imbalance and maintain self-esteem in society, the individual feels the tendency to achieve, but unfortunately, the path towards success is not the same as the path toward thinking. In other words, there is no urgent need to be equipped with thinking skills to pass higher education levels. This is the reason why the dimensions of critical thinking in this study cannot be related to the motivation to progress in the dimension of identifying assumptions.

Due to the presence of some limitations in the current research, caution must be applied in the generalization and interpretation of the results. For example, the present study is descriptive that does not allow inferring the cause-and-effect relationship. The use of self-reported tools makes it possible for participants to distort the report. The research method in this study is cross-sectional, so there is a possibility that this communication pattern is not constant over time. Also, the limitation of the results to the student population adds caution regarding the generalizability of the results to other communities and is a reminder of the necessity of conducting similar studies at other educational levels involving students in different grades of education. The findings of the present research could have practical implications for educational bodies such as the Ministries of Science, Research and Technology, Education, and Culture and Islamic Guidance. This research showed that, by opening the way to satisfy the basic psychological needs of students (self-governing, merit, communication), it is possible to help improve their achievement motivation, which will increase students' academic engagement and, as a result, in more success. Considering the weakness of students in critical

thinking dimensions, it is suggested to hold workshops for teaching effective processes in critical thinking for students and to compare the achievement of students who have been trained and those who have not been trained in the variable of critical thinking.

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