

Predicting Five Minds Based On Individual, Educational, Social and Cultural Factors among Student Teachers

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Abstract

Background

According to education experts, learning the concepts and topics of the information technology age is influenced by the five minds introduced by Gardner, therefore, it is necessary to pay attention to these five minds in educational centers and identify the factors affecting it. The aim of the present study was to investigate the relationship between individual, educational, social and cultural factors with five minds among student teachers.

Materials and Methods

This was a descriptive-analytical research and its statistical population included all student teachers of Farhangian University of Kerman, Iran, in 2020. A total of 400 people were selected by stratified random sampling. The data collection tool included two researcher-made questionnaires. Data were analyzed using Pearson correlation coefficient and multiple linear regression in SPSS ver. 25.

Results

The results showed a positive and significant relationship between individual, educational, social and cultural factors with Gardner's five minds, so that these four factors simultaneously ($R^2_{adj} = 422$) explain the variance of the five minds. Moreover, the most important predictors of the five minds of student teachers are individual factors ($\beta = 0.266$, $p = 0.001$), social factors ($\beta = 0.229$, $p = 0.001$), and educational factors ($\beta = 0.20$, $p = 0.001$), and cultural factors ($\beta = 0.166$, $p = 0.001$), respectively.

Conclusion

Based on the research results, individual, educational, social factors and cultural factors were the predictors of five minds among the student teachers.

Key Words: Educational, Five minds, Individual, Social and Cultural factors.

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1- INTRODUCTION

The world is changing rapidly, and university students, especially those studying the teaching profession, must be educated based on the updated needs and foundations of new psychology. This is where new curricula that meet the new needs for teacher professional development come into play (1). One of the factors that help teachers' professional training is the combination of theory and practice, which has been emphasized while improving the quality of student teachers' education in various researches (2, 3). One of the theories that has been emphasized in recent years to be transferred to the students' curriculum is Gardner's theory of five minds, because according to education experts, if teachers are familiar with the five minds model and can apply it in the classroom, they can train more successful students (4, 5). Education specialists, especially curriculum planners, are constantly looking for solutions that, theoretically, empirically, and practically, ensure and guarantee student success and academic achievement (6).

In this regard, Gould et al. (7) emphasize the importance of paying attention to theories of intelligence, especially multiple intelligences, with a special focus on the Gardner' theory of five minds (8) in education of student teachers. In *Five Minds for the Future*, Gardner addresses the issues of the 21st century. He states that the world of the future, influenced by information technology with search databases, social networks, bots, e-commerce and new computer systems, will need capabilities that were considered optional so far. Therefore, we need to cultivate the related abilities, i.e. five minds in order to face this new world (9, 10). In his book, Gardner discusses five minds, three of which are related to intelligence issues and two minds to interpersonal relationships, which are disciplined mind, synthesizing-mind,

creative mind, respectful mind, and ethical mind. This theory has been highly regarded by educational thinkers in educational communities (11, 12). On the other hand, have professional competencies is a need for continuous professional development of teachers (13-16). Fullan and Stiegelbauer (2011) state that training Gardner's five minds is an inevitable necessity for the professional development of teachers (17, 18). Gardner (8) states that students can be successful in learning new age issues if function properly in the five minds. He also states that one of the signs of the inability to learn new age issues is the poor function in the five minds (8). If the five minds of students and university students is taken into account while teaching each lesson, the disconnect between the different academic courses is eliminated to a great extent and the students' information in different subjects is interconnected and students can practically observe the use of different courses in daily life (19, 20).

Gardner (8) believes that human beings can respond to environmental stimuli in a variety of ways. He also argues that each person has the least basic abilities in each type of intelligence, but everyone is more prominent in some intelligences than others. The application of the theory of the five minds in teaching makes it possible for teachers to teach on the basis of individual differences and the learning process can be more efficient and enjoyable (21). According to Gardner, the five minds can play an important role in students' learning and education (22). Eisner (2007) states that teaching based on the theory of five minds has many benefits for both teachers and students; for example, students feel comfortable and competent in such classes. Mig et al. (2018) found in a study that classes that are based on the theory of five minds increase students' academic achievement and also had positive effects on attitudes

toward learning (23). The theory of the five minds can be used as a model in structural strategies for student success. When students participate effectively and actively in the learning process, their motivation to learn more automatically increases (24). According to some results, it increases the learning of students with learning disabilities in the classroom (25), and has positive effects on attitudes toward learning (26). On the other hand, one of the most important and sensitive educational centers in our country is Farhangian University, because the students of this university will be engaged in educating students in schools after graduation. Moreover, if these teachers are not familiar with the five minds and their five minds not nurtured and educated, they will not be successful in teaching students.

On the other hand, cultivation of the five minds requires identifying the effective factors in this regard, because the assumptions and effective backgrounds involved in the five minds can be strengthened by identifying these factors. To our best knowledge, there have been few studies on these factors and their role in the five minds, especially the five minds of students and university students in Iran. Accordingly, the present study aims to investigate the role of individual, educational, social and cultural factors in the five minds of student teachers and seeks to answer the question: Do individual, educational, social and cultural factors predict the five minds of the teacher students?

2- MATERIALS AND METHODS

2-1. Study design and population

This is an applied research with regard to its aim and descriptive correlational concerning its method.

2-2. Methods

The study population includes all 1900 student teachers of Farhangian University

in Kerman, Iran, in 2020. Considering that this article is extracted from a doctoral dissertation and structural equations are used in the dissertation, and there 20 variables are obvious in the dissertation, and 20 samples are selected for each variable, therefore, the sample size is estimated 400 people (159 women and 241 men). The stratified sampling method was used taking into account the sex ratio of the students. Considering that 40% (n=760 people) of Farhangian University students in Kerman were women and 60% (n=1140 people) were men, therefore, 40% (n=159 people), and 60% (n=241 people) were selected from female and male students from April 3 to June 19, 2020.

2-3. Measuring tools

Data collection tool consisted of two questionnaires as follows:

2-3-1. Gardner's Five Minds Questionnaire

This questionnaire was developed by Gardner (8) to measure the five minds, which consists of 25 questions and its options are scored based on a five-point Likert scale (Never=1, Rarely=2, Sometimes=3, Often=4, and Always=5). This questionnaire measures the five minds: disciplined mind (questions 1 to 5), synthesizing mind (questions 6 to 10), creative mind (questions 11 to 15), respectful mind (questions 16 to 20), and ethical mind (questions 21 to 25). Also, each mind is measured with 5 questions and the possible score range for each mind is between 1 and 25, with higher scores indicating the higher ability of the person in that mind. The total score of the five minds is between 25 and 125. Fullan and Stiegelbauer (27) reported that the construct validity of this questionnaire was 0.68. Ghorbankhani (27), also reported that the construct validity of this questionnaire based on five minds was 0.63 and stated that its content and face validity was appropriate. He also measured its

reliability coefficient using Cronbach's alpha method ($\alpha=0.81$). In the present study, the reliability coefficient of this questionnaire was calculated by Cronbach's alpha method ($\alpha=0.87$).

2-3-2. Questionnaire of effective factors

To assess the effective factors, a 40-item researcher-made questionnaire was developed that measures individual (questions 1 to 10), educational (questions 11 to 20), social (questions 21 to 32) and cultural factors (questions 33 to 40). The content and face validity of this questionnaire was confirmed based on the opinion of 5 experts with a coefficient of 0.72. Its construct validity was also obtained by exploratory factor analysis (EFA) ($r=0.59$). The total reliability coefficient of this questionnaire was calculated by Cronbach's alpha method ($\alpha=0.93$). Moreover, the reliability coefficient for individual, educational, social and cultural factors was obtained 0.86, 0.85, 0.90, and, 0.87, respectively.

2-4. Inclusion criteria

Being a student at Farhangian University of Kerman, being bachelor student, willingness to participate in research.

2-5. Exclusion criteria

Being a guest student at Farhangian University in Kerman, unwillingness to answer some questionnaire questions.

2-6. Data Analyses

Data analysis was carried out using descriptive and inferential statistical methods including Pearson correlation coefficient and multiple linear regression in SPSS software (version 23.0). Kolmogorov–Smirnov test was used to measure normality of data distribution and the results indicated the normality of data distribution ($P\text{-value}<0.05$).

3- RESULTS

Results showed that 60.3% of the respondents were male, 39.7% were female, and the age range of the respondents was between 19 and 27 years.

3-1. Descriptive statistics of research variables

Table.1 shows that the mean score of the five minds was 91.1% among the participants. Also, the mean score of disciplined, synthesizing, creative, respectful, and ethical mind was 17.71, 18.17%, 18.12, 18.54, and 18.47, respectively. In addition, the mean score of individual, educational, social, and cultural factors was 38.53, 39.17, 46.88, and 30.98, respectively.

Table-1: Descriptive indicators of research variables.

Variables	Mean (SD)	Minimum	Maximum
Disciplined mind	17.71 (3.41)	8	25
Synthesizing mind	18.17 (3.83)	7	25
Creative mind	18.12 (4.06)	6	25
Respectful mind	18.54 (4.30)	6	25
ethical mind	18.47 (4.09)	7	25
five minds	91.01 (14.64)	37	118
Individual factors	38.53 (8.1)	11	50
Educational factors	39.17 (7.50)	13	50
Social factors	46.88 (9.28)	16	60
Cultural factors	30.98 (5.66)	11	40

SD: Standard deviation.

3-2. Research Hypothesis

Individual, educational, social and cultural factors predict the five minds. Pearson test shows a significant relationship between individual, educational, social and cultural factors with the five minds of student teachers ($p < 0.05$) (**Table.2**). Positive correlation coefficients indicate a positive relationship between individual ($r = 0.487$, $p = 0.001$), educational ($r = 0.531$, $p = 0.001$), social ($r = 0.50$, $p = 0.001$), and cultural factors ($r = 0.436$, $p = 0.001$) with five minds of student teachers.

The linear regression model shows a significant relationship between individual, educational, social and cultural factors with the five minds of student teachers ($p < 0.05$) (**Table.3**) ($f = 72.17$, $p = 0.001$). Multiple correlation coefficient is $r = 0.65$, which indicates a significant relationship between individual, educational, social and cultural factors with the five minds of student teachers ($p < 0.001$). Individual, educational, social and cultural factors simultaneously explain 0.422 of the variance of the five minds of student teachers ($R^2_{adj} = 422$).

Table-2: Correlation values and significance levels between research variables.

Variables	1	2	3	4	5	6	7	8	9	10
Individual Factors	1	-	-	-	-	-	-	-	-	-
Educational Factors	R=.556 P=.001	1	-	-	-	-	-	-	-	-
Social Factors	R=.30 P=.001	R=.508 P=.001	1	-	-	-	-	-	-	-
Cultural Factors	R=.251 P=.001	R=.40 P=.001	R=.537 P=.001	1	-	-	-	-	-	-
Disciplined Mind	R=.268 P=.001	R=.334 P=.001	R=.336 P=.001	R=.297 P=.001	1	-	-	-	-	-
Synthesizing Mind	R=.353 P=.001	R=.381 P=.001	R=.369 P=.001	R=.344 P=.001	R=.698 P=.001	1	-	-	-	-
Creative Mind	R=.344 P=.001	R=.391 P=.001	R=.346 P=.001	R=.281 P=.001	R=.413 P=.001	R=.421 P=.001	1	-	-	-
Respectful Mind	R=.332 P=.001	R=.421 P=.001	R=.408 P=.001	R=.339 P=.001	R=.447 P=.001	R=.474 P=.001	R=.447 P=.001	1	-	-
Ethical Mind	R=.497 P=.001	R=.433 P=.001	R=.388 P=.001	R=.354 P=.001	R=.372 P=.001	R=.374 P=.001	R=.409 P=.001	R=.378 P=.001	-	-
Five Minds	R=.487 P=.001	R=.531 P=.001	R=.50 P=.001	R=.436 P=.001	R=.766 P=.001	R=.785 P=.001	R=.729 P=.001	R=.752 P=.001	R=.689 P=.001	1

P: P-value, R: Pearson correlation coefficient.

Table-3: Summary of multiple correlation model of individual, educational, social and cultural factors with five minds.

Criterion variable	R	R ²	F	Sig.
Disciplined Mind	0.41	0.168	19.97	0.001
Synthesizing Mind	0.481	0.231	29.69	0.001
Creative Mind	0.457	0.209	26.05	0.001
Respectful Mind	0.50	0.25	32.91	0.001
Ethical Mind	0.576	0.332	49.01	0.001
Five Minds	0.65	0.422	72.17	0.001

Predictor: individual, educational, social and cultural factors, Criterion variable: five minds. R: Pearson correlation coefficient.

Table.4 shows the most important predictors of the disciplined mind were social ($\beta = 0.165$, $p = 0.005$), educational ($\beta = 0.139$, $p = 0.025$), and cultural ($\beta = 0.125$, $p = 0.024$), and individual factors ($\beta = 0.11$, $p = 0.048$), respectively. The most important predictors of synthesizing mind were individual ($\beta = 0.194$, $p = 0.001$), social ($\beta = 0.162$, $p = 0.004$), cultural ($\beta = 0.157$, $p = 0.003$), and educational factors ($\beta = 0.125$, $p = 0.032$), respectively.

The most important predictors of the creative mind were educational ($\beta = 0.18$, $p = 0.003$), individual ($\beta = 0.177$, $p = 0.001$) and social factors ($\beta = 0.16$, $p = 0.006$), respectively.

The most important predictors of a respectful mind were social ($\beta = 0.207$, $p = 0.001$), educational ($\beta = 0.196$, $p = 0.001$), individual ($\beta = 0.132$, $p = 0.012$), and cultural factors ($\beta = 0.116$, $p = 0.027$), respectively. The most important predictors of ethical mind were individual ($\beta = 0.362$, $p = 0.001$), social ($\beta = 0.155$, $p = 0.004$), and cultural factors ($\beta = 0.141$, $p = 0.005$), respectively.

The most important predictors of student teachers five minds were individual ($\beta = 0.266$, $p = 0.001$), social ($\beta = 0.229$, $p = 0.001$), educational ($\beta = 0.20$, $p = 0.001$), and cultural factors ($\beta = 0.166$, $p = 0.001$), respectively.

Table-4: Regression model coefficients of the relationship between individual, educational, social and cultural factors with the five minds.

Criterion variable	Predictor variable	B	Std. Error	Standardized Coefficients Beta	T-test	Sig.
Disciplined Mind	Fixed	8.28	1.08	-	7.63	.001
	Individual Factors	.046	.023	.11	1.99	.48
	Educational Factors	.063	.028	.139	2.25	.025
	Social Factors	.061	.022	.165	2.8	.005
	Cultural Factors	.075	.033	.125	2.26	.024
Synthesizing Mind	Fixed	5.64	1.17	-	4.82	.000
	Individual Factors	.092	.025	.194	3.33	.000
	Educational Factors	.065	.03	.125	2.16	.032
	Social Factors	.067	.023	.162	2.86	.004
	Cultural Factors	.106	.036	.157	2.95	.003
Creative Mind	Fixed	5.86	1.26	-	4.65	.000
	Individual Factors	.089	.027	.177	3.27	.000
	Educational Factors	.097	.033	.18	2.99	.003
	Social Factors	.07	.025	.16	2.78	.006
	Cultural Factors	.057	.039	.079	1.46	.144
Respectful Mind	Fixed	4.23	1.3	-	3.26	.000
	Individual Factors	.07	.028	.132	2.52	.012
	Educational Factors	.112	.034	.196	3.34	.000
	Social Factors	.096	.026	.207	3.7	.000
	Cultural Factors	.088	.04	.116	2.22	.027
Ethical Mind	Fixed	3.01	1.17	-	2.58	.01
	Individual Factors	.186	.025	.362	7.31	.000
	Educational Factors	.052	.03	.096	1.73	.084
	Social Factors	.068	.023	.155	2.94	.004
	Cultural Factors	.102	.036	.141	2.85	.005
Five Minds	Fixed	47.02	3.88	-	6.97	.000
	Individual Factors	.48	.083	.266	5.77	.000
	Educational Factors	.391	.10	.20	3.89	.000
	Social Factors	.361	.077	.229	4.67	.000
	Cultural Factors	.429	.119	.166	3.6	.000

4- DISCUSSION

The aim of the present study was to predict the five minds based on individual, educational, social and cultural factors among student teachers. The results showed that individual, educational, social and cultural factors predict the disciplined, synthesizing, creative mind, respectful, and ethical mind. Moreover, the most important predictors of the five minds of student teachers are individual, social, educational and cultural factors, respectively. The results of the current study also showed that individual factors are predictors of disciplined, synthesizing, creative, respectful, and ethical mind. Consistent with the above results, Saricaglu and Arikan (6) concluded that individual factors such as sex, age, general intelligence, and psychological characteristics affect Gardner's multiple intelligences. Xie and Lin (10) states that motivation for progress affects problem-solving ability and personality traits of multiple intelligences.

Bennetts (14) concluded that there is a significant relationship between factors such as general intelligence, mental health, age, sex, problem-solving ability, and reasoning power with the five minds. Abdulkader, Gundogdu and Ali Eissa (13) state sex, age, intelligence, and problem-solving ability are the factors that affect the five minds. Based on these results, it can be said that when students' academic motivation is higher, they have a lot of motivation for progress and success, are mentally healthy, and do not have psychological problems such as stress, depression, anxiety, etc.; are able to solve a problem and divide a problem into its components, understand the relationships between details and have an open and adaptable personality; are at a good level in terms of intelligence and have the talent to learn different problems, therefore, they can have an disciplined mind, progress in a specialized field, and show good

creativity in solving problems. The results of the present study also show a positive and significant relationship between educational factors with Gardner's five minds, that is, when students' academic achievement is high, professors' academic level and quality of education is high, curriculum planning is accurate and course content is rich, the educational facilities of the university are suitable for using educational technology for teaching, and the financial conditions of the university are suitable for providing quality services and education, therefore, students can have disciplined, creative, synthesizing, and respectful minds and cultivate these minds.

Consistent with these results, Saricaglu and Arikan (6) concluded that individual factors of academic motivation and achievement predict Gardner's multiple intelligence. Bennetts (14) concluded that there is a significant relationship between educational factors such as level of education and quality of education with the five minds. Johnson (11) concluded that educational factors such as teaching method, course content, and educational facilities predict the five minds of elementary students. Köksal and Yel (28) concluded in their research that factors such as academic attitude, academic motivation, and educational facilities can be effective in cultivating the five minds of students. The findings of the present study also indicate that social factors predict the five minds of student teachers and there is a significant and positive relationship between social factors and disciplined, synthesizing, creative, respectful, and ethical mind. That is, when social factors are strengthened, the five minds of students are also strengthened. Consistent with these results, Anne Beichner (29) states that social interactions and social participation strengthen the respectful and ethical mind. Fam (22) has concluded that social trust fosters a synthesizing and ethical mind. Abdulkader, Gundogdu and

Ali Eissa (13), also state that social responsibility can strengthen the foundations of a respectful and disciplined mind. Yuan Own and Wen Li (30) has stated that we must pay special attention to social factor in order to succeed in strengthening the five minds. Therefore, it can be concluded that the five minds are influenced by social factors, so, if the social interactions of students are strengthened and the level of participation in academic associations and group discussions is strengthened, then we can expect student teachers to be experts in their field of study, and have innovative ideas on various issues. According to the results of the present study, cultural factors are predictors of the five minds, so that there was a significant and positive relationship between cultural factors with disciplined, synthesizing, respectful, and ethical mind. That is, the five minds are better developed when cultural conditions in educational centers and society are improved. Consistent with these results, Tak Tak Shing (31) states that strengthening and modifying the culture and cultural structure of society, especially in the educational system, is essential for cultivating the five minds. Xie and Lin (10) states that parents' level of education and their familiarity with educational theories can be useful and effective in educating the five minds. Harriman (32) states that mass media play useful and constructive role in cultivating five minds. Gurcay and Eryilmaz (33) state that strong religious beliefs and attitudes play a decisive role in cultivating a respectful and ethical mind. Based on these results, it can be said that cultural factors along with individual, educational and social factors can be constructive in cultivating and strengthening the five minds of students.

5- CONCLUSION

Based on the research results, individual conditions such as academic motivation, achievement motivation,

socio-economic status, psychological health, problem-solving ability, talent, intelligence and personality traits; educational factors such as academic achievement, academic level of professors, curriculum, educational facilities, and financial conditions of the university; social factors such as social interactions, social participation, social responsibility and trust; and cultural factors such as parents' level of knowledge and literacy, social class, media use, family relationships, and religious beliefs can affect students' five minds.

6- CONFLICT OF INTEREST: None.

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