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Analyzing The Main Components Of The Mathematics Literacy Education Curriculum For Iran's Mathematics Education Undergraduate Student Teachers And Presenting Its Future Research Model

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Abstract
The main goal of this research is to analyze the main components of the mathematics literacy education curriculum for the undergraduate students of mathematics education in Iran and to present a future research model. The current research is applied in terms of purpose and survey in terms of method. The statistical population of the research was experts in the field of mathematical literacy who were selected using the purposeful sampling method. The instrument of data collection was a questionnaire, and MICMAC and Excel software were used for data analysis. Examining the obtained results showed that the standardization of education is the most influential factor. Also, the individual characteristics of the learner were placed as the first priority of effectiveness. In addition, the investigation of potential direct and indirect effects showed that these two factors have the highest amount. Based on the results obtained from the map of direct and indirect effects, the standardization of training and the application of training were placed in the independent matrix, which means they have high effectiveness and low effectiveness. Indicators such as constructive interactions, principled evaluation, skill, and development of mathematical knowledge were placed in the link matrix, which has high dependence and high guiding power, and any small change in these variables causes fundamental changes in the system. Also, the indicators of attitude, empowerment, and development of theoretical knowledge were included in the dependent matrix, which shows that these variables have little influence on the system. In addition, no index was included in the autonomous matrix, which shows that all the model indices are important and cannot be removed.

Keywords: Mathematical Literacy, Principal Component Analysis, MIC Analysis.

Introduction
To implement quality education services, students in different educational levels must use all resources to achieve the intended goals, and one of the most important resources is the curriculum. The curriculum is one of the important components of education that improves the quality of education and is related to self-confidence, piety and ethics, physical and mental health, recognition of one's own and other's rights, and strengthening national and religious vision (Tabroni et al., 2022; Naeim et al, 2020). A curriculum can be defined as a roadmap to achieve learning goals, students' learning experiences, or learning content, but in general, planning includes intended goals, learning content, materials, methods, and assessments to achieve desired goals (Yang and Li, 2022). The global attention to the issue of literacy has caused different countries to change and modify their curricula and set the ultimate goal of the programs to achieve different levels of literacy

and the ability of citizens in different functions of social life after school and real life. Literacy has several dimensions, one of which is mathematical literacy. Even though mathematical literacy has different definitions, the most common definition was provided by the Organization for Economic Cooperation and Development (2015), according to which, mathematical literacy is an individual ability to formulate, apply and interpret mathematics in the context It is different. It includes mathematical reasoning and the use of concepts, methods, facts, and mathematical tools to describe, describe and predict phenomena. It helps people understand the role that mathematics plays in the world and is essential for making the reasoned judgments and well-founded decisions needed to be productive, thoughtful, engaged citizens (Holenstein et al., 2021).

Certain factors affect the effectiveness of teaching literacy in mathematics. Ewing Monroe and Orme (2002), argue that literacy may be ineffectively integrated into mathematics education, an issue that is exacerbated by time constraints or teachers who are cautious about teaching literacy in their subjects. Also, the teacher's limited knowledge affects math literacy (Schleppegrell, 2007). In this regard, (Raiker, 2002; Kotsopoulos, 2007) believe that to teach mathematics and mathematical literacy, it is necessary to avoid confusion in the classroom and teachers must have deep knowledge of the subject. One of the components of knowledge is the correct use and accuracy in the mathematical language (Quinnell, 2016). In addition, several educators have pointed out that student teachers have limited content knowledge in the subject (Livy & Vale, 2011; Norton, 2010). Also, Yaftian and Shayan (2019) conducted research in Iran. The performance of math teachers in this test showed that teachers are facing problems in answering real-world questions. The noteworthy point in this research is that the more the level of the questions got further from the level of the familiar concepts of the textbooks, or in other words, the problems took on a more objective face, in the sense that they moved away from the mathematical world and closer to the real world, the performance Teachers were reduced in solving these problems.

Despite the efforts in different countries of the world to provide curricula based on mathematical literacy, research, and their participation in the Pisa test and study and analysis of its results, Iran has not participated in this test so far.

Of course, considering the poor results obtained by Iranian students in TIMSS math exams in different periods (2015, 2011, 2007, 2003) (TIMSS and PIRLS website), it seems that if they participate in the Pisa test, they will also get good results. They will not because the study of Thames includes routine issues and is based on common chapters of the official curricula of the participating countries, and therefore its questions are less relevant (Wu, 2008). But the Pisa study questions are designed based on student's ability to communicate between the real world and the mathematical world. However, Iranian students have not performed well in solving familiar and routine problems that comprise a major part of the mathematics curriculum. Although, from the perspective of the fundamental transformation document of the Islamic Republic (2012), students' school experiences should be as close as possible to real-life experiences, and even educational activities and experiences designed in school should be based on the real challenges and issues of students' lives, and the direction of the curriculum of the field Mathematics education in Iran is to empower students to solve peripheral and real-world problems in various fields (Yaftian and Shayan, 2019), but internal researches have reflected the weakness of students, curricula and teachers in the issue of mathematical literacy.

Recently, researches have been conducted on many aspects of maths literacy, focusing on teachers in all corners of the world, for example (Machaba, 2018) in the field of teachers' educational needs for math education and math literacy; (Krishnannair, Maharaj and Brijlall, 2017) in terms of the intended goals and the achieved goals of the mathematical literacy program in practice; (Quinnell, 2016) about mathematical literacy in pre-service education; (Jamali Winter, 2014) about the type of teaching and learning of student teachers for mathematical literacy; (Botha, 2011) the relationship between teachers' knowledge and their educational beliefs and experiences in math literacy classes; (Sidiropoulos, 2008) implementation of the compulsory curriculum of mathematical literacy and how teachers think about it; (Hechter, 2011)

Analysis and understanding of the development of teacher's mathematical literacy in mathematical literacy courses; (Firdaus, Herman and Herman, 2017) have conducted researches in the field of developing elementary students' mathematical literacy through different teaching and learning methods.

Although the research conducted from various aspects has dealt with the teaching of mathematical literacy in teachers and students, teachers and students, a curriculum for teaching mathematical literacy to student teachers have been designed and it has not been provided to provide the main components of the math literacy training program for student teachers. It seems that in line with the lack of a specific curriculum for mathematical literacy or numerical literacy in different academic courses, as well as the lack of their components in the Iranian mathematics curriculum, in the undergraduate course of mathematics education, teaching based on mathematical literacy is not considered. Mathematical literacy training programs for student teachers become important because, according to what was mentioned, even with the design of context-oriented or reality-oriented curricula based on mathematical literacy for students of different academic courses, the training of mathematically literate students is far from becoming accessible, because practically a teacher who has not acquired the skills and competences of mathematical literacy or does not have the approach of teaching based on mathematical literacy, cannot provide the opportunities to acquire these skills for his students, and in other words, the curriculum intended with What will be achieved in practice will be a long way. Therefore, the main problem of this research is to analyze the main components of the mathematics literacy education curriculum for the undergraduate students of mathematics education in Iran and to present its future research model.

Method

The present research is considered to be applied research in terms of its purpose and a survey research method in terms of its method. The statistical population of the current research includes all thematic contents and theoretical foundations related to math education and math literacy and the curriculum in the teacher training system, including books, documents, articles and theses in the field of math literacy and the Pisa test, advanced TIMSS, High-level documents related to the teacher training system of Iran, such as the document on the fundamental transformation of education and training, the national curriculum document, the comprehensive scientific map of the country, the vision document on the horizon of 2025, the general policies of the system of approvals of the Supreme Council of Cultural Revolution and the Supreme Council of Education, strategic plan Farhangian University is in the vision of 1404 and the statutes of Farhangian University and the mathematics education undergraduate curriculum of Farhangian University and other supporting documents of the country's education system and all professors, experts and experts in curriculum planning and math education and math experts, which were selected by library sampling method, in addition to this, the data obtained from the opinion of experts in the field of mathematical literacy was obtained through a questionnaire. The sampling method of the research is purposive sampling which is non-probability and selected with a small size. Respondents are selected from among people who have a special connection and belong to the subject of the study (Crouch and McKenzie, 2006). The sample size also depends on the theoretical saturation and cannot be determined from the beginning. In the present research, 13 experts in the field of mathematical literacy answered the questionnaires.

Results

Exploratory factor analysis

Knowing the possibility of factor analysis on the data

To find out whether the relevant data can be reduced to several factors or not, we use the following two tests:

Kaiser-Meyer-Olkin (KMO)sampling adequacy index and Bartlett's sphericity test

The sampling adequacy test, marked with the abbreviation KMO, fulfills the first objective of factor analysis. That is, this test determines whether the variance of the research variables is influenced by the common variance of some hidden and fundamental factors or not? In factor analysis, the principal components method is used to extract factors. As seen in Table 2, the Kaiser-Meyer-Olkin (KMO) sampling adequacy index is 0.930, which indicates that the research data can be reduced to several basic factors and the sample size is sufficient. Also, the result of Bartlett's test (7640), which is significant at the 0.01 error level, shows that there is a good correlation between the indicators within the factor.

Table 1. Sampling adequacy index and Bartlett's coefficient

Index	The amount of
Keyser-Meir-Olkin (KMO) sampling adequacy index	0.930
Bartlett's Test	7640.899
df	861
Sig.	0.000

Knowing the contribution of the set of factors in explaining the variance of each index

The reason for using exploratory factor analysis: to ensure the correct classification of indicators, with the help of exploratory factor analysis, factors are first statistically identified, then factors are named according to the nature of the variables in which they are placed.

In this research, by referring to the results of the second column of the table below-titled Extraction, we can find out how much the total of the extracted factors has been able to explain the changes of each index.

Table 2. The amount of commonalities of each variable

Index	Extracted	Index	Extracted	Index	Extracted
curious	0.908	The necessity of reality-oriented issues in the education system	0.928	Developing knowledge about modeling	0.893
risk taker	0.903	Enthusiasm is enough to apply your lesson	0.861	Modeling issues	0.938
Mood	0.974	Localization issues	0.824	Strengthening mathematical knowledge	0.948
be serious	0.881	Teaching practical problems	0.781	Probability and Algebra	0.950
Flexible thinking	0.854	Teaching and conveying the requirement of the existence of reality-based problems to students	0.788	Specialized knowledge of mathematics	0.910

changeable	0.850	Implementation of textbook activities	0.774	Statistical analysis	0.889
Perseverance	0.925	Management of class administration	0.806	Familiarization with the scientific knowledge and goals of Pisa and theological topics	0.899
Up-to-date person	0.857	Construction oriented environment	0.811	Acquiring skills and training to learn and solve problems	0.945
Being consistent	0.866	Class activities	0.821	Acquisition of design and observation skills	0.919
Interest in doing work	0.853	Interactive methods	0.685	Acquire planning skills	0.857
Facilities such as websites and computer programs	0.893	Workshop method	0.908	Assessment of students and recognition of their mathematical literacy	0.928
Use of multimedia	0.938	Critical thinking between students and professors	0.903	End-of-semester evaluation	0.893
Compliance with global standards	0.948	Interaction between three cognitive, emotional, and motor factors	0.974	Conducting end-of-semester exams in an open-book format and providing sufficient time	0.938
Up-to-date training	0.950	Discussion and critical thinking between professors and students	0.881	Believe in your abilities	0,948
Fixing the defect of the existing program	0.910	Arrangement of learning programs	0.854	Creating opportunities to design problems and activities for students	0.950
Fixing the defects of textbooks	0.889	Creating theoretical	0.850	Creating the right mental	0.974

		knowledge and skills in teachers		structure in students	
Integrated content training	0.899	Creating awareness and knowledge in students	0.925	Creating and strengthening a new attitude	0.908
Improving the level of educational quality and attitude of students	0.945	Familiarity with the goals of Pisa and mathematical literacy	0,857	Understanding the necessity of studying	0.903
Putting people in different situations in practice	0.919	Providing useful and sufficient knowledge	0.866	Opening a new window in your work	0.974
Doing things practically	0.857	financial mathematics	0.853		

In Table 3, the set of values of the factors extracted after rotation is given. It is related to the eigenvalues and determines the factors that remain in the analysis (factors with an eigenvalue less than 1 are excluded from the analysis). The factors excluded from the analysis are the factors whose presence does not explain more of the variance. The results show that 10 factors have an eigenvalue greater than 1 and remain in the analysis. In other words, the indicators of the questionnaire are influenced by 10 underlying factors. These 10 factors can explain more than 89% of the variability (variance) of the variables.

Table 3: Number of factors and total variances extracted

Factors	**Initial eigenvalues**			**The set of extracted factors values after rotation**		
	Eigenvalues	**variance Percentage**	**cumulative percentage**	**Eigenvalues**	**variance Percentage**	**cumulative percentage**
1	27.630	46.830	46.830	27.630	46.830	46.830
2	6.767	11.469	58.298	6.767	11.469	58.298
3	4.329	7.337	65.636	4.329	7.337	65.636
4	3.275	5.551	71.187	3.275	5.551	71.187
5	2.739	4.642	75.829	2.739	4.642	75.829
6	2.120	3.593	79.422	2.120	3.593	79.422
7	1.797	3.045	82.467	1.797	3.045	82.467
8	1.489	2.524	84.991	1.489	2.524	84.991
9	1.275	2.161	87.152	1.275	2.161	87.152
10	1.116	1.892	89.045	1.116	1.892	89.045

The results of Table 3 show that each factor was able to explain how many percent of the variance of the set of variables. In the output of the table, ten factors with an eigenvalue higher than one have been extracted. Therefore, from a total of 59 indicators, they can be reduced to 10 conceptual factors. The eigenvalue of the first factor is 27.63 and the eigenvalue of the last factor is 1.116.

The graph below shows the contribution of each factor to the total variance. In the diagram below, the number of points that have an eigenvalue higher than one shows the number of factors. As can be seen, the first factor accounts for the largest amount of the total variance with a variance of 46%.

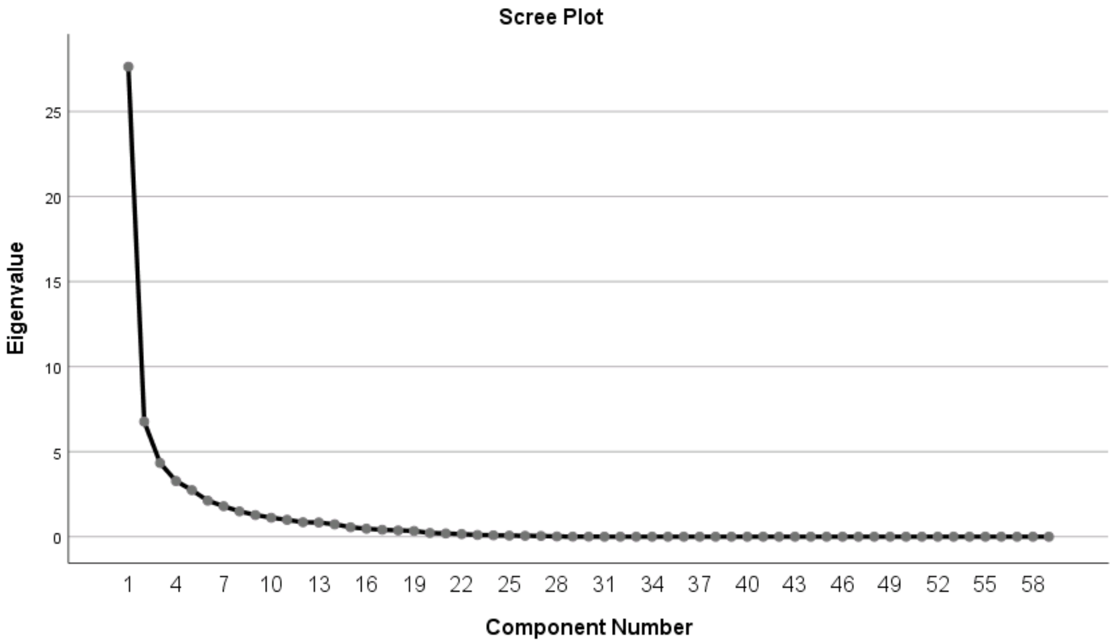

Figure 1: Contribution of each factor to the total variance

Table 4 shows the rotated matrix of the components, which includes the factor loadings of each of the remaining variables after rotation. Also, each variable is considered in the factor that has a higher loading.

Table 4: Identified factors and factor load of each variable (rotated factor matrix)

	Index	Identified factors									
		1	2	3	4	5	6	7	8	9	10
Individual characteristics of the learner	curious	0.549	0.367								
	risk taker	0.828									
	Mood	0.802		-0.365							
	be serious	0.472	0.599								-0.345
	Flexible thinking	0.543	0.463					0.322			
	changeable	0.810									
	Perseverance	0.683		0.515							
	Up-to-date person	0.690		0.415							

	Being consistent	0.645			-0.318		0.482	
	Interest in doing work	0.659		0.494				-0.350
Standardization and improvement of education quality	Sites and computer programs	0.342	0.739				0.397	
	Use of multimedia	0.412	0.580			-0.440		
	Compliance with global standards	0.315	0.783	0.304				
	Up-to-date training	0.523	0.787	-0.509				
	Fixing the defect of the existing program	0.389	0.743	-0.460				
	Fixing the defects of textbooks	0.443	0.796			-0.322		
	Integrated content training	0.342	0.669		0.317			
	Improving the educational quality of students	0.415	0.636		0.322			
Applicability of education	Putting people in practical situations		-0.510	0.698				
	Doing things practically		-0.362	0.743				
	Reality-oriented issues in the education system			0.710		0.340	-0.315	
	Enthusiasm is enough to apply your lesson			0.825				
	Localization issues		0.499	0.614				
	Teaching practical problems			0.694	0.390			
	Teaching and conveying the requirement of the existence of			0.568				-0.357

	reality-based problems to students										
	Implementation of textbook activities			0.489			-0.446		0.493		
Constructive interactions	Management of class administration	0.300			0.690			0.334	0.486	0.462	
	Construction oriented environment			0.312	0.772						
	Class activities				0.696						
	Interactive methods				0.549						
	Workshop method		0.667		0.828						
	Critical thinking between students and professors				0.802						
	Interaction between cognitive, emotional, and motor factors			-0.365	0.472						
	Discussion and critical thinking between professors and students				0.599						-0.345
Development of mathematical knowledge	financial mathematics		0.463			0.543		0.322			
	Developing knowledge about modeling					0.810					
	Modeling issues			0.515		0.683					
	Strengthening mathematical knowledge			0.415		0.690					
	Probability and Algebra				-0.318	0.645	0.482				
	Specialized knowledge of mathematics			0.494		0.659		-0.350			
	Statistical analysis		-0.346			0.739					

	Familiarization with the scientific knowledge and goals of Pisa and theological topics	0.560			0.580			
Development of theoretical knowledge	Arrangement of learning programs		0.304			0.783		
	Creating theoretical knowledge and skills in teachers		-0.509			0.787		
	Creating awareness and knowledge in students		-0.460			0.743		
	Familiarity with the goals of Pisa and mathematical literacy				-0.322	0.796		
	Providing useful and sufficient knowledge	-0.484		0.317		0.669		
Skill	Skills and training to learn and solve problems	-0.630		0.322			0.636	
	Acquisition of design and observation skills	-0.510					0.698	
	Acquire planning skills	-0.362					0.743	
Fundamental and scientific evaluation	Assessment and diagnosis of maths literacy				0.340	-0.315		0.710
	End-of-semester evaluation	-0.346				0.397		0.739
	Conducting end-of-semester exams as an open book	0.560			-0.440			0.580

Empowerment	Believe in your abilities		0.304	0.783	
	Creating activity opportunities for students		-0.509	0.787	
	Creating the right mental structure in students		-0.365	0.802	
Attitude	Creating and strengthening a new attitude	0.667			0.549
	Understanding the necessity of studying				0.828
	Opening a new window in your work		-0.365		0.802

MICMAC analysis

In the current research, the expert Delphi model and MICMAC software, and strategic management approaches have been used. MICMAC software is designed to perform heavy calculations of interaction matrix and also to facilitate structural analysis. The approach of this research is exploratory about the purpose of studying and choosing possible and believable states for uncertainties, and it seeks to draw possible and believable futures by developing scenarios.

In the first step of the research, 10 indicators were counted and collected by examining the documents, and experts were asked to check the desired variables through a questionnaire and to identify the indicators that are effective in the field of mathematics literacy education curriculum for Iran's mathematics education undergraduate students in the future and if they know something as a key factor that is not mentioned in the questionnaire, they should state it. In addition, they were asked to identify and categorize the key factors that have the greatest effect on the curriculum of mathematics education for the undergraduate students of mathematics education in Iran, by entering the number of the desired option in the matrix of effect on passing, to determine the influence of each of these factors on each other and it was explained that the row variables are influential and the column variables are influential. The selection options for scoring were as follows.

Number zero: no effect, number one: low effect, number two: medium effect, and number three: high effect.

After scoring each of the experts in the relevant matrix table, to obtain a single matrix table for use in the software, because all the people in the field of designing and validating the mathematics literacy training curriculum for the undergraduate students of mathematics education in Iran They were experts. The simple average of the points given by the people was entered as matrix table data in the MICMAC software. The results are presented below.

According to the results of the software, the filling degree of the matrix is 78.00%, which shows that the selected factors have highly effective on each other. Out of the total of 78 relationships that can be evaluated in this matrix, 22 relationships have a zero value, which means that the factors did not influence each other or were not influenced by each other. 16 relationships, the number of which had a small effect on each other, 34 relationships, the number of which was 2, which means that they had a relatively strong influencing link, 28 relationships, the number of which was 3, which means that the relationships of key factors were very high and of influence and secondary influence. They have had a lot. Finally, no relationship, their number P, was reported, which indicated the lack of potential and indirect relationships of the factors.

Table 5. The results of summing the matrix of direct and indirect effects

		Direct Effects		Indirect Effects	
		Effectiveness Amount	**Influence Amount**	**Effectiveness Amount**	**Influence Amount**
1	**Individual characteristics of the learner**	5	24	1193	5636
2	**Standardization of education**	27	5	6333	1234
3	**Application of education**	25	8	5631	1677
4	**Constructive interactions**	21	19	4353	4329
5	**Development of mathematical knowledge**	16	18	3386	4029
6	**Development of theoretical knowledge**	14	20	2941	4565
7	**Skill**	18	18	4394	4015
8	**Fundamental and scientific evaluation**	16	19	3766	4297
9	**Empowerment**	12	17	2556	3730
10	**attitude**	14	20	3524	4565
	Total	168	168	168	168

In the cross matrix, the sum of the row numbers of each variable, the degree of influence, and the column sum of each variable also show the degree of influence of that variable from other variables. Examining the results obtained from the above table, standardization of education was reported as the most influential factor with a score of 27. Also, the individual character of the learner with a total of 20 among the factors was placed as the first priority of influence. The degree of desirability of the optimization effects matrix is 100%, which indicates the high validity of the questionnaire and its related answers. The following, states the types of relationships and direct and indirect effects, as well as the rank and amount of the variables measured by the MICMAK software.

Table 6: Direct and indirect effects

Row	Title	Direct Effect	Title	Direct Dependency	Title	Indirect Effect	Title	Indirect Dependency
1	2C	1607	1C	1428	2C	1663	1C	1480
2	3C	1488	6C	1190	3C	1478	6C	1198
3	4C	1250	10C	1190	7C	1153	10C	1198
4	7C	1071	4C	1130	4C	1143	4C	1136

5	5C	952	8C	1130	8C	989	8C	1128
6	8C	952	5C	1071	10C	925	5C	1058
7	6C	833	7C	1071	5C	889	7C	1054
8	10C	833	9C	1011	6C	772	9C	979
9	9C	714	3C	476	9C	671	3C	440
10	1C	297	2C	297	1C	313	2C	324

As can be seen in Table 6, the results obtained from the examination of direct effects show that the education standardization data (C2) had the highest amount of direct and indirect effects. The individual character of the learner (C1) obtained the highest score of direct and indirect dependence among other criteria.

Table 7. Potential direct and indirect effects

Row	Title	Potential Direct Effect	Title	Potential Direct Dependency	Title	Potential Indirect Effect	Title	Potential Indirect Dependency
1	2C	1607	1C	1428	2C	1663	1C	1480
2	3C	1488	6C	1190	3C	1478	6C	1198
3	4C	1250	10C	1190	7C	1153	10C	1198
4	7C	1071	4C	1130	4C	1143	4C	1136
5	5C	952	8C	1130	8C	989	8C	1128
6	8C	952	5C	1071	10C	925	5C	1058
7	6C	833	7C	1071	5C	889	7C	1054
8	10C	833	9C	1011	6C	772	9C	979
9	9C	714	3C	476	9C	671	3C	440
10	1C	297	2C	297	1C	313	2C	324

The results obtained from the investigation of direct effects showed that the standardization of education (C2) had the largest amount of potential direct and indirect effects. The individual characteristics of the learner (C1) have obtained the highest score of potential direct and indirect dependence among other criteria. Through MICMAC software and according to the analysis diagram of variables in the direct effects matrix, the direct effects map output from MICMAC software has been examined:

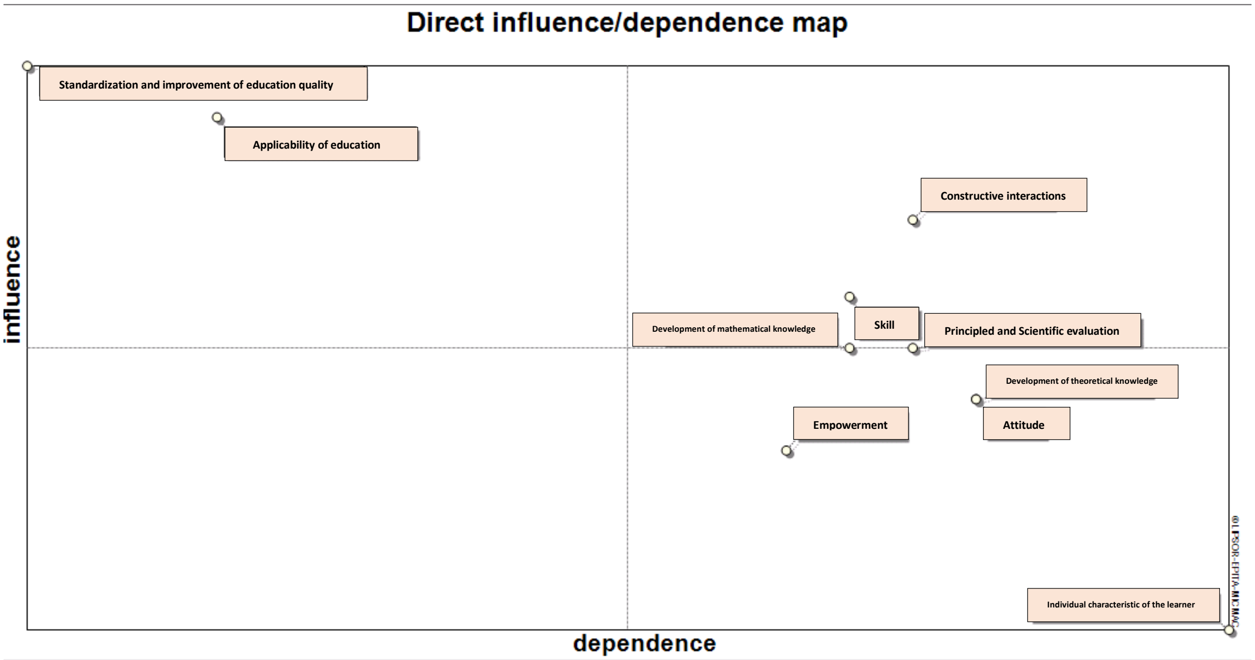

Figure 2. Direct effectiveness and influence of factors map

Based on the results obtained from the map of direct and indirect effects, the standardization of training and the application of training were placed in the independent matrix. This means that these variables have low dependence and high directivity, in other words, high effectiveness and low influence are the characteristics of these variables. No index was included in the autonomous matrix. This shows that all the indicators of the model are important and cannot be removed. Most indicators such as constructive interactions, principled evaluation, and skills were included in the linked matrix, which showed that these indicators have high dependence and high guiding power. In other words, the effectiveness and effectiveness of this criterion are very high and any small change in this variable causes fundamental changes in the system. Other indicators were also included in the dependent matrix. which showed that this variable has strong dependence and weak direction. These changes generally have a high influence and little effectiveness on the system.

Discussion and conclusion

The purpose of the current research is to analyze the main components of the mathematics literacy education curriculum for the undergraduate student teachers of mathematics education in Iran and to present a future research model. In factor analysis, the principal components method was used to extract factors. The Kaiser-Meyer-Olkin sampling adequacy index is 0.930, which indicates that the research data can be reduced to several basic factors and the sample size is sufficient. Also, the result of Bartlett's test (7640), which is significant at the 0.01 error level, shows that there is a good correlation between the indicators within the factor. The results show that 10 factors have an eigenvalue greater than 1 and remain in the analysis. In other words, the indicators of the questionnaire are influenced by 10 underlying factors. These 10 factors can explain more than 89% of the variability (variance) of the variables. From a total of 59 indicators, they can be reduced to 10 conceptual factors. The eigenvalue of the first factor is 27.63 and the eigenvalue of the last factor is 1.116. Examining the results obtained from the MICMAC analysis of education standardization was reported as the most influential factor with a score of 27. Also, the individual character of the learner with a total of 20 among the factors was placed as the first priority of influence. The degree of desirability of the optimization effects matrix is 100%, which indicates the high validity of the questionnaire and its related answers. The results obtained from the investigation of direct effects showed that the standardization of education (C2) had the largest amount of direct and indirect effects. The individual character of the learner (C1) obtained the highest score of direct and indirect dependence among other criteria. The results obtained from the investigation of direct effects showed that the standardization of education (C2) had the largest amount of potential direct and indirect effects. The individual character of the learner (C1) obtained the highest score of potential direct and indirect dependence among other criteria. Based on the results obtained from the map of direct and indirect effects, standardization of education and application of education were placed in the independent matrix. This means that these variables have low dependence and high directivity, in other words, high influence and low influence are the characteristics of these variables. No index was included in the autonomous matrix. This shows that all the indicators of the model are important and cannot be removed. Most indicators such as constructive interactions, principled evaluation, and skills were included in the linked matrix, which showed that these indicators have high dependence and high guiding power. In other words, the effectiveness and effectiveness of this criterion are very high and any small change in this variable causes fundamental changes in the system. Other indicators were also included in the dependent matrix. which showed that this variable has strong dependence and weak direction. These changes generally have high effectiveness and little impact on the system.

Examining the results of the current research in the sense that it is considered fundamental research, has made it difficult to compare its results with previous research for alignment or non-alignment. In research, Afkhami (2013) investigated the mathematical literacy of students during their academic years according to the changes in textbooks. Based on the findings of this research, elementary students were significantly more successful in solving context-oriented problems than middle and high school students. Yaftian and Shayan (2019) in their research titled evaluating the performance of ninth-grade students in the math literacy test, investigated the level of math literacy of the students with the help of Pisa test questions. The findings of the research indicate that students are not familiar with these problems and they do not want to use these problems in exams and math books. The results of Ebrahimi Alavijeh's research (2016) showed a little emphasis on real-world problems and heterogeneous distribution of problems based on the mathematical content of the problems, the background of the problem, and the processes needed to solve the problems. The study of internal research in the field of mathematical literacy shows the fact that the research gap in this field is noticeable and the results of the current research cannot be compared with the previous findings, and the current research is a new effort regarding mathematical literacy.

Machaba (2018) showed that teachers' teaching strategy for mathematics was direct instruction. At the same time, the teachers who taught math literacy, although they were mostly math teachers and not special maths literacy teachers, believed that math literacy should be taught using a problem-solving approach because math literacy should be presented with real-life problems. Fuey and Idris (2017) have conducted research titled evaluating the validity of the elements of the mathematics teacher education program in the Malaysian mathematics teacher education curriculum.

Mathematics is known as the most important subject in an educational foundation. Usually, students in Iran and most countries are evaluated by math scores. Meanwhile, the current way of teaching mathematics in Iran forces students to memorize the course material. This method does not develop the ability for logical thinking, creativity, and problem-solving in them. It only forces students to retell math information. Despite the identification of the general goals of mathematics education, the teaching methods used by teachers are not very successful in achieving these goals.

The global attention to the issue of literacy caused different countries to change and modify their curricula and set the ultimate goal of the programs to achieve different levels of literacy and the ability of citizens in different functions of social life after school and real life.

The results obtained from the present research showed that the standardization and improvement of the quality of education are considered the basis and foundation of mathematical literacy. Undoubtedly, providing high-quality services in education is vital. Having quality services affects the survival and growth of the educational system. The higher education system has two quantitative and qualitative dimensions. The requirement for sustainable and comprehensive development of this system is balanced growth in these dimensions. Paying attention to quantitative growth and neglecting qualitative growth leads to unfortunate consequences for this system such as academic failure, scientific dependence, lack of creativity and entrepreneurship, brain drain, and poor production of science. Considering the important role of the educational system in the training of specialized human resources needed by the society that can accelerate the movement of the society towards the development of all, the importance of the qualitative aspect of education becomes more apparent.

In this regard, it is the higher education system that deals with people's lives. That is, the health of society depends on the quality of education in these universities. In between, it is the students, professors, and staff who take steps to improve society in various scientific, spiritual, psychological, and social aspects. In case of not designing appropriate and quality educational programs, irreparable damage will be caused to the health of the society, the scientific reputation of the university, and the graduates. Therefore, those involved in education should identify the effective factors for the improvement and quality of education. Evaluation of the quality of services is considered one of the basic steps in developing programs to improve the quality of educational services.

Another basic variable in the math literacy model is the application of math education. Mathematics is known as the most important subject in an educational foundation. Usually, students in Iran and most countries are evaluated by math scores. Meanwhile, the current way of teaching mathematics in Iran forces students to memorize the course material. This method does not develop the ability for logical thinking, creativity, and problem-solving in them. It only forces students to retell math information. Despite the identification of the general goals of mathematics education, the teaching methods used by teachers are not very successful in achieving these goals. The findings of Krishnannair et al. (2017) showed that despite the satisfactory formulation of the objective of the lesson unit for the mathematics literacy course, the amount of intended and achieved objectives in achieving the objectives of the curriculum was not satisfactory. And so the conception of the goal was in complete contrast to the experience of the goals. The research findings of Fuey and Idris (2017) indicated that six factors make up the mathematics teacher training curriculum, namely professional development, psychology, technology, history, philosophy, and social constructivism. In this study, these six constructs were extracted and identified as the builders of a mathematics teacher training curriculum.

Empowering teachers was another concept in the present model, although it was influenced by some other concepts, it affected many other factors. Today, empowerment is considered not only one of the most basic educational goals but also the most challenging factor for its effectiveness (Romano et al., 2020). Therefore, empowerment has emerged as an organizing concept to support educational ideas, policies, and programs. This requires a new look at human resources and their powers. The necessity of training teachers who have self-management abilities has caused human resource empowerment to be used as a new technique. People have latent power due to their knowledge, experience, and motivation, and in fact, empowerment is the release of this power. Using the potential abilities of human resources is considered a great advantage for the educational system. The conducted studies show that capable people are a great asset to the organization and management. Because they are self-directed and reliable and can adapt to the internal and external changes of the organization.

The sensitivity of this issue in educational organizations, especially education, is more than in other organizations. Because education and training is a comprehensive, dynamic, and effective institution on all-round moral, political, economic, religious, legal, social, and cultural behaviors and norms of society, the nature of its activities and goals is to promote the spirit of creativity, prosperity, and Emergence of talents, raising the level of general and specialized awareness and determining the strategy to achieve excellence, development, prosperity, and growth. However, studies conducted in the country show that currently, the human resources management system of the Ministry of Education lacks a suitable framework for empowering its employees (Beigzadeh et al, 2019). Quinnell (2016) conducted research titled "Mathematical literacy in pre-service education". The researcher receives the four-source model and directs it towards discovery with the collaborative structure of knowledge through all five discourse models and focuses on the interpretation and generalization of symbols, images, and verbal descriptions, promoting the expansion of literacy learning. Also, the research showed that student teachers have many problems related to math literacy, including problems in decoding and creating meaning, and many of these challenges were related to conceptual understanding. For example, when faced with specific mathematical codes and conventions used in stem and leaf diagrams and box plots, they had problems decoding and making meaning. Also, the research has identified pedagogical strategies in the program based on the four-source model within a social constructivism framework to develop the participants' mathematical literacy knowledge.

Constructive interactions were among other concepts that were individually placed at the fourth level and have provided the basis for the realization of many elements of the model. In line with the expansion of science, scientific cooperation between countries, research organizations and different people has increased with a considerable acceleration. Providing the possibility of facilitating and exchanging knowledge, taking advantage of new thoughts and ideas, using instrumental and laboratory facilities and facilities, and saving time and costs during the formation of group collaborations are effective factors that make researchers and universities do this. They encourage (Gregor, 2006). Scientific cooperation can be considered as a reflection of the activities and approaches of the scientific community; Studying and investigating this category can also help the sociology of science (Chen et al, 2019). Because education in the new era has many complexities and requires a wide range of knowledge and information, researchers are forced to cooperate scientifically to conduct comprehensive and complete research. Attitude, skill, evaluation, theoretical knowledge, and mathematical knowledge were among the other elements of the model that were influenced by the introduced variables and were mutually influencing each other.

Performance evaluation in facilitating organizational effectiveness is considered an important task of human resource management. In recent years, a lot of attention has been paid to the role of performance evaluation. According to experts, an effective performance evaluation system can bring a lot of advantages to organizations and their employees. Longenecker and Nykodym (1996), have stated that the performance evaluation system; a) provides specific functional feedback to improve the performance of employees, b) Determines the requirements of the employee's training, c) provides and facilitates the development of employees, d) Establishes a close relationship between personnel conclusion and performance and e) increases the motivation and productivity of employees. Also, Roberts and Pavlak (1996) believe that performance evaluation is used for multiple purposes of supervision and development, including, a) to evaluate individual performance according to organizational needs, b) predicting feedback to employees to improve or strengthen their behavior, and c) allocating rewards and Career promotion of people is used.

At the same time, nowadays many human resources and usual management systems do not seem suitable and old models are considered ineffective. During the last decade, many organizations have realized that they lack a performance evaluation system through which their priorities and goals can be communicated to employees and their improvement can be followed. Due to the wide range of cognitive areas and the use of various tools such as feeling, observation, perception, experience, and the power of belonging and thinking, human beings are sensitive to various issues, especially in evaluating and interpreting behavior and performance of employees, and the set of these factors makes hiring managers to evaluate effective performance under has made an impact. Finally, at the elementary level of the model, the individual characteristics of the teacher are given. This means that the individual character is a

reliable variable in the model while being influenced by other variables. Ochagavia (2017) receiving cognitive accelerator programs has been successful in improving students' reasoning skills and changing teachers' pedagogy and their application. The results showed that the cognitive acceleration course has made positive changes in future teachers' attitudes about teaching and learning in general and mathematics in particular.
In the last few decades, according to the results of studies done by educational researchers and psychologists, especially in the field of cognitive sciences, one of the proposed and defensible approaches in educational activities has been the cognitive approach.
According to Carpenter et al (2012), a mathematical concept is understood when its mental representation becomes a part of the network of representations. The level of understanding is determined by the number and strength of connections. In other words, an idea, process, or mathematical truth is fully understood if it is connected to existing networks through more and stronger connections. With a cognitive approach, rejecting the idea that children's minds are whiteboards that can be engraved with the desired role, he considers children to be the creators of their knowledge. Based on this approach, learning occurs when children are mentally active. As an example, the National Council of Mathematics Teachers of America has been one of the institutions influencing mathematics education in the last two decades, which has organized its activities based on this approach.
The main concern of this council was to produce a program that would be the basis for the development of students' mathematical thinking. In other words, this council has emphasized the development of problem-solving and reasoning abilities instead of mechanical calculations and has designed its products based on this. Specifically, the principles and standards of school mathematics are one of the important documents that this council produced in 2000 and is still used as a comprehensive guide by mathematics programmers in many countries. Regarding the effectiveness and how to implement this approach in mathematics education, much research has been done at the world level (Schoenfeld, 2002; Davis, 2014; Cobb et al, 2011).
Also in Iran, with the growth of mathematics education studies, various researches have been done in this field based on the cognitive approach (Zeynivandnezhad et al, 2012; Gooya and Gholam Azad, 2017) and all of them point to the positive effects of cognitive approach on students' understanding. However, the observations indicate that most of the results of the research have remained more within the theoretical limit and it is less possible to implement them in the mathematics education system of Iran.

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