

Content Analysis of Work and Technology Curriculum in the Junior High School

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Abstract

Purpose: The present study aims at analyzing the content of work and technology curriculum in the junior high school.

Methodology: A qualitative and applied research method was used, which was performed based on the content analysis. The statistical population consisted of work and technology curricula of the junior high school in the academic year 2019-2020, which were examined without sampling. The data collection tool was a triple list designed based on the goals of economic-professional education set out in the fundamental reform document of education. The collected data were analyzed using Shannon entropy software.

Findings: In this software, the frequency of each data unit was identified, its indices of descriptive statistics were extracted and the importance coefficients of each of them were reported. The data in this study was in the form of themes, photos and learning activities. Therefore, data analysis was performed by using descriptive statistics indicators and their quantitative analysis. The results showed that the rate of emphasis on economic-professional education in work and technology curricula in each of its eight goals was as follows: understanding professional skills 0.99, professional ethics 0.066, entrepreneurship 0.053, avoiding unemployment 0.052, observance of productivity 0.040, commitment to ethics and values 0.039, wealth development 0.038, business laws 0.032, economic justice 0.

Conclusion: The content analysis of the work and technology curricula of the first year of high school showed that the understanding of professional skills in the seventh grade was 46.6%, in the eighth grade was 75.4% and in the ninth grade was 61.5%.

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1. Introduction

Today, many experts consider the emergence of economic problems and lack of resources in society as the cause of failure to solve problems in other areas. The absence and disarray in economic culture causes economic challenges (Adib, 2016, p. 49). Lacking culture-building and economic-professional education will make the society face a weak economic culture. For example, in formal education, the student is instilled with the attitude of how to be employed after graduation, while the idea of how to become an entrepreneur after graduation should be promoted. If the approach of creativity and entrepreneurship is taken into account in economic-professional education, students will be acquainted with the deepened concept of work, wealth creation and dynamic economy and will communicate with it (Imani, 2012). In the current Iranian society, where economic-professional problems have increased and the phenomenon of unemployment is more obvious than before, the need for economic-professional education in the education system has become more prominent than ever. In the fundamental reform document of education, the economic and professional educational field is defined and its requirements for executives and stakeholders are outlined (Peyghami, 2011). This shows that the education system is aware of the need to address economic-professional education in schools, and in the curriculum has considered specific topics for this purpose (Mo'tamed, 2016).

UNESCO has defined six types of literacy for education systems, which it considers necessary to address in the global life, and has recommended training them in the education system of countries as a necessity. These cases are: emotional literacy, communicative literacy, media literacy, educational literacy, computer literacy and financial literacy (Toghyani, 2016). In defining financial literacy, UNESCO has considered approaches such as production, commerce, management of micro and macroeconomics, monetary management, and ethical economics. Responsibility, transparency, legalism and avoidance of any wrongdoing, embezzlement and lawlessness are emphasized in the financial literacy (Taybi, 2017). Accordingly, work and technology curricula are taught in each of the three grades of junior high school. The importance of this plan is that students become familiar with the types of formulated work and technology modules, even selecting and implementing the optional modules intended for them, and would experience them in the form of class and non-class activities. Receiving teacher feedback from these activities guides the student towards optimal learning skills. Therefore, it can be said that education has followed the major part of students' economic-professional education through the implementation of work and technology curricula.

But to in this study addressed the question "to what extent it has been successful?" In economic-professional education, the mechanisms of moral economics are taught. In fact, every economic activist addresses the social interest as much as he does for himself, and he plays a role in generating wealth. In economic - professional education, financial literacy skills are taught to students which are commensurate with their educational background (Swedberg, 2012, translated by Heshmati, 2016). In study, the importance of economic education and professional training of students has been mainly dealt with (Mir Hosseini, 2016) or its challenges have been outlined (Mo'tamed, 2016). In one comparative study, the economic goals of the profession in the reform document were compared with the Japanese educational system (Basirati, 2016) and in another, only the components of economic education were described (Alipour, et al, 2016). In fact, there has been a kind of study gap. In this study, the status and importance of economic-professional education has been comprehensively examined. In view of the above, and given that the fundamental reform document of education has emphasized the economic and professional education of students, the question arose what is the position of economic-professional education in high school curricula and what is the unwanted value of learners' encounter with these programs? Undoubtedly, paying attention to the economic-professional education of students is one of the most important priorities in education. The findings of this study will have multiple implications. First, it will determine to what extent economic and professional education has been addressed in overt and covert curricula, and secondly, the possible shortcomings of economic and professional education in secondary education have been identified and

provided to those involved. In addition, the optimization strategies and model of economic education are identified, designed, and validated so that the practitioners can address this fundamental need in education more than before. The curriculum for work and technology in the junior high school incorporates modules that stimulate creativity in students, motivate the student to perform innovative activities, and designing work and profession. That is why this type of curriculum has been emphasized in this study.

The findings of this study are expected to provide practical solutions to teachers, administrators, education experts as well as textbook authors in the field of economic and professional education. In the fundamental reform document of education for the economic-professional education, 9 goals have been considered, including: understanding professional skills, paying attention to professional ethics, maintaining and developing wealth, avoiding idleness and unemployment, observance of productivity, diligence in developing economic justice, observance of business laws and adherence to ethics and values (Fundamental reform document of education, 2011). The education system has been obliged to provide appropriate mechanisms for each of these goals in its curricula so that they can achieve a significant number of these goals (Ahadi, et al., 2014). Attempts were also made to consider practical activities in these prescriptive, semi-prescriptive and optional modules in order to create social and revenue opportunities for students to practice and do their homework (Farhadi, 2016). Experts believe that economics, unlike the natural sciences, is not pure science, but a set of principles that are voluntarily manifested by individuals in society (Arianfar, 2016). There was an expectation that students should be taught the do's and don'ts of economic life in the curriculum (Roozbehan, 2017).

Economic education includes the skills and competencies that students experience in the school and workshop environment (Kaminski, 1996). Countries that have made significant progress in the field of economics have taught their students the theoretical and behavioral concepts of professional ethics (Swedberg, 2012). These countries have taught students professional education programs in the form of an integrated approach in the fields of business, skills training, professional ethics, adherence to values and ethical practice (Gal, Translated by Kardan, 2003). Therefore, if today's society expects students to be given a model of economic and professional education in schools, it is rooted in global experiences, national needs and social necessity. In terms of the goals of economic-professional education, the fundamental reform document has been related to these approaches. Any insufficiency, indifference and negligence in this area will cause students to deviate from the path of their real life and are hindered from the acquisition of competencies in the future. This motivation led to the present study. So the basic question is: What are the features of economic-professional education curricula for junior high school students?

2. Methodology

This study was performed through content analysis method, in which, the contents of the work and technology curriculum for the seventh to ninth grades of high school have been examined. The data collection tool was checklists that were designed based on the seven goals of economic-professional education in the fundamental reform document of education. The statistical population included the textbooks of seventh to ninth grades of work and technology of the junior high school in the academic year of 2019-2020. In this study, there was no sampling and the whole content of the mentioned community was examined. A qualitative data analysis method was used in which the frequency of each unit of data was processed, classified and analyzed through Shannon entropy software in the form of themes, photos and learning activities based on the existing economic education goals in the curriculum. In this software, there were features that revealed the frequency and percentage of each of the available data and their diversity was listed in order of priority. Then, the coefficient of importance of each category was reported and even the rate of emphasis on the curriculum goals was reported separately by educational level. Thereafter, data analysis was performed using descriptive statistics indicators and their quantitative analysis.

3. Findings

Table1. Data observed in economic and professional education in the seventh grade work and technology textbook

Frequency objective	Understanding professional skills	Professional ethics	Entrepreneurship	Wealth development	Avoiding unemployment	Productivity	Economic justice	Business rules	Commitment to ethics and values	Summary of observations	Total data in the book
Total observances	296	11	24	20	20	16	1	12	7	407	459
Percentage	64/6	2/4	5/3	4/4	4/4	3/5	0/3	2/7	1/6	88/7	100

This table reflects the frequency and percentage of finalized data units in the seventh grade high school textbook in the field of economic-professional education. In the interpretation of these educational data, emphasis has been made on the rate of emphasis of this course content based on the nine goals of economic-professional education set forth in the fundamental reform document of education. These are as follows:

Regarding the understanding of professional skills, there are 296 units of economic-professional education data, which is 64.6% of the total textbook. Regarding professional ethics, there are 11 units of economic-professional education data, consisting of 2.4% of the total textbook. In the case of entrepreneurship, the economic-professional education data set included 24 units, which is 5.3% of the total textbook. In the case of wealth development, the economic-professional education data included 20 units, i.e. 4.4% of the total textbook. In terms of avoiding unemployment, the economic-professional education data included 20 units, i.e. 4.4% of the total textbook. There were 16 units in the productivity of the economic-professional education data set, which is 3.5% of the total textbook. Also, one unit was related to the economic justice accounting for 0.3% of the total textbook.

In the case of business laws, there were 12 units in the set of economic-professional education data units, which is 2.7% of the total textbook. Regarding the commitment to ethics and values, there were 7 economic-professional education data units, comprising of 1.6% of the total textbook. In total, the frequency of economic-professional education data units in the seventh grade work and technology textbook was 407, while there were a total of 459 data units in the textbook. It can be said that the emphasis of this textbook on economic-professional education has been 88.7%. This finding has been in line with the results of Kazempour (2019), Peyghami (2011), Motamed (2016), Toghyani (2016), Arianfar (2016) and Euron Samper (2018).

Table2. Total data observed in economic and professional education in the eighth grade work and technology textbook

Frequency objective	Understanding professional skills	Professional ethics	Entrepreneurship	Wealth development	Avoiding unemployment	Productivity	Economic justice	Business rules	Commitment to ethics and values	Summary of observations	Total data in the book
Total observances	348	15	10	9	12	9	4	6	17	430	463
Percentage	75/4	3/3	2/2	2	2/6	2	0/9	1/3	3/7	93/1	100

This table reflects the frequency and percentage of finalized data units in the eighth grade high school textbook in the field of economic-professional education. In the interpretation of these educational data, the emphasis rate of this curriculum content was determined based on the nine goals of economic-professional education set forth in the fundamental reform document of education, which are as follows:

In terms of understanding professional skills, there were 348 units in economic-professional education data set, comprising of 75.4% of the total textbook. In the case of professional ethics, there are 15 units of economic-professional education data set, i.e. 3.3% of the total textbook. In the case of entrepreneurship, there were 10 units in the economic-professional education data set, which includes 2.2% of the total textbook. In the case of wealth development, there were a total of economic-professional 9 education data units, which is 2% of the total textbook. In the case of avoiding unemployment, there were 12 economic-professional education data units, which is 2.6% of the total textbook. In terms of productivity, the economic-professional education data set included 9 units, which is 2% of the total textbook. In the case of economic justice, the economic-professional education data set included 4 units, i.e. 0.9% of the total textbook.

In the case of business laws, the set of economic-professional education data includes 6 units, i.e. 1.3% of the total textbook. In the case of adherence to ethics and values, there were 17 units in the economic-professional education data set. In total, the economic-professional education data set in the eighth grade work and technology textbook included 430 units, while the total data unit of the textbook was 463. It can be said that the rate of emphasis of this textbook on economic-professional education has been 93.1%.

Table3. Total data observed in economic and professional education in the ninth grade work and technology textbook

Frequency objective	Understanding professional skills	Professional ethics	Entrepreneurship	Wealth development	Avoiding unemployment	Productivity	Economic justice	Business rules	Commitment to ethics and values	Summary of observations	Total data in the book
Total observances	284	34	17	7	20	16	-	14	16	408	451
Percentage	61/5	7/6	3/7	1/6	4/4	3/5	-	3/1	3/5	88/4	100

This table reflects the frequency and percentage of finalized data units in the ninth grade high school textbook in the field of economic-professional education. In the interpretation of these data, the rate of emphasis of this course content was determined based on the nine goals of economic-professional education set forth in the fundamental reform document of education. These cases are as follows: Regarding the understanding of professional skills, the data set of economic-professional education unit included 284 units, which is 61.5% of the total textbook. Regarding professional ethics, the data unit set of economic-professional education included 34 units, which is 7.6% of the total textbook. In the case of entrepreneurship, the economic-professional education data set included 17 units, which is 3.7% of the total textbook. In the case of wealth development, the economic-professional education data set included 7 units, which is 1.6% of the total textbook. In the case of avoiding unemployment, the economic-professional education data set included 20 units, which is 4.4% of the total textbook. Regarding the productivity of the economic-professional education data set, there were 16 units, which is 3.5% of the total textbook. In terms of the economic justice, there were no economic-professional data units.

In the case of business laws, the economic-professional education data set has 14 units, which is 3.1% of the total textbook. In the case of adherence to ethics and values, the economic-professional education data set had 16 units, accounting for 3.5% of the total textbook. In total, the frequency of economic-professional education data units in the ninth grade work and technology textbook was 408, while the total data unit of the textbook was 451. It can be said that the rate of emphasis of this textbook on economic-professional education has been 88.4%. This is in line with the results of Mir Arab (2018), Adib (2016), Motamed (2016), Mir Hosseini (2016), Arianfar (2016), Euron Samper (2018).

Table4. Frequency Distribution and Percentage of Economic-Professional Education Data Units in Work and Technology Curriculum of the Junior High School

Level	Observation frequency	Frequency of book data units	Description
Seventh	405	459	88.7% was about economic-vocational education
Eighth	430	462	93.1% was about economic-vocational education
Ninth	408	451	88.4% was about economic-vocational education
All three levels	1243	1372	90.6% was about economic-vocational education
Percentage	90/6		

As can be seen, in all three textbooks of work and technology from seventh to ninth grades, there were 1372 units of educational messages, of which 1243 were about economic-professional education, consisting of 90.6% of the curricula of the junior high school. Junior high school graduates are expected to become familiar with the nine goals of economic-professional education set forth in the fundamental reform document of education and provided in these textbooks, and to achieve their knowledge, skills, and attitudes based on the mentioned goals.

Table5. The importance coefficient of the goals of economic-professional education in the seventh grade of work and technology curriculum

Results	Proximity coefficient
Understanding professional skills	0.9952
Avoiding unemployment	0.069
Productivity	0.0505
Entrepreneurship	0.049
Wealth development	0.0487
Professional ethics	0.0444
Business Rules	0.0184
Commitment to ethics and values	0.0151
Economic justice	0

Table (5) reflects the importance coefficients of each of the goals of economic-professional education in the seventh grade work and technology curriculum. These coefficients are listed in order of importance and the highest absolute value, respectively; so that it can be observed that the highest emphasis of this curriculum has been on understanding professional skills and the least emphasis on the economic justice. At the same time, it can be said that the first five priorities of economic-professional education in this curriculum have been emphasized to an acceptable level.

Table6. Importance coefficient of the goals of economic-professional education in the eighth grade of work and technology curriculum

Results	Proximity coefficient
Understanding professional skills	1
Avoiding unemployment	0.0386
Productivity	0.037
Entrepreneurship	0.0322
Wealth development	0.0318
Professional ethics	0.0275
Business Rules	0.0269
Commitment to ethics and values	0.0226
Economic justice	0.0098

Table (6) reflects the importance coefficients of each of the goals of economic-professional education in the eighth grade work and technology curriculum. These coefficients are listed in order of importance and maximum absolute value, respectively. As can be seen, the greatest emphasis of this curriculum has been on understanding professional skills and the least emphasis has been on economic justice. At the same time, it can be said that the first five priorities of economic-professional education in this curriculum have been emphasized at an acceptable level.

Table7. The importance coefficient of the goals of economic-professional education in the ninth grade work and technology curriculum

Results	Proximity coefficient
Understanding professional skills	1
Avoiding unemployment	0.121
Productivity	0.0709
Entrepreneurship	0.0674
Wealth development	0.0576
Professional ethics	0.0556
Business Rules	0.0544
Commitment to ethics and values	0.0263
Economic justice	0

Table (7) reflects the importance coefficients of each of the goals of economic-professional education in the ninth grade work and technology curriculum. These coefficients are listed in order of importance and maximum absolute value, respectively. As can be seen, the greatest emphasis of this curriculum has been on understanding professional skills and the least emphasis has been on economic justice. At the same time, it can be said that two of the goals of economic-professional education have been emphasized at the maximum level, and the other cases have been addressed at a lower level.

Table8. Comparison of the status of economic and professional education in the work and technology curriculum of the junior high school by Shannon entropy method

Results	Proximity coefficient
Understanding professional skills	1
Avoiding unemployment	0.0664
Productivity	0.0532
Entrepreneurship	0.0523
Wealth development	0.0409
Professional ethics	0.0396
Business Rules	0.0383
Commitment to ethics and values	0.0324
Economic justice	0

Table (8) reflects the importance coefficients of each of the goals of economic-professional education in the work and technology curriculum of the junior high school. These coefficients are listed in order of importance and maximum absolute value, respectively. As can be observed, the highest emphasis of this curriculum is dedicated to understanding professional skills and the least emphasis is on economic justice. The first three factors to be emphasized are: understanding professional skills, professional ethics and entrepreneurship.

In Shannon entropy statistical analysis, the importance coefficients of priorities are interpreted with the concept of proximity coefficient. As it was observed, the greatest emphasis on the goals of economic-professional education was in the work and technology curriculum of the eighth grade, followed by the seventh grade and the ninth grade, respectively. In fact, it can be said that the highest emphasis on economic-professional education is observed in the eighth grade and the least emphasis in the ninth grade.

In these curricula, each of the goals of understanding professional skills, professional ethics, entrepreneurship, avoiding unemployment, observing productivity, adhering to ethics and values, wealth development and business rules are emphasized, each of which had acceptable significance coefficients slightly different with each other. However, in the case of the economic justice, the relevant coefficient was zero, which indicates that these curricula do not emphasize this component.

4. Discussion

The content analysis of the work and technology curricula of the junior high school showed that the understanding of professional skills was 46.6% in the seventh grade, 75.4% in the eighth grade and 61.5% in the ninth grade. Shannon entropy technique revealed the importance coefficient of understanding professional skills in each of the grades as follows: 0.99 in seventh grade, 1 in eighth grade and 1 in ninth grade. These coefficients were of maximum utility importance. This content analysis showed that professional ethics had attracted attention by 2.4 percent in the seventh grade, by 3.3 percent in the eighth grade and by 7.6 percent in the ninth grade. The Shannon entropy technique revealed the importance coefficient of paying attention to professional ethics in each of the bases as follows: 44% in seventh grade, 38% in eighth grade, 121% in ninth grade. These coefficients are evaluated below the average level in terms of absolute value. The analysis of the data unit in the mentioned curriculum showed that entrepreneurship was emphasized in the seventh grade by 3.5%, in the eighth grade by 2.2% and in the ninth grade by 3.7%. Shannon entropy technique revealed the importance of entrepreneurship in each of the grades as follows: 49% in seventh grade, 27% in eighth grade, 55% in ninth grade. It can be said that entrepreneurship education in overt work and technology curricula has been somewhat taken into account.

Content analysis of work and technology curricula in the junior high school showed that the level of attention to “attempting to maintain and develop wealth” was 4.4 percent in the seventh grade, 2 percent in the eighth grade and 1.6 percent in the ninth grade. The Shannon entropy technique revealed the importance coefficients of the level of attention as 48% in the seventh grade, 32% in the eighth grade and 26% in the ninth grade, respectively, which were evaluated to be very low. This analysis showed that avoidance of unemployment was 4.4% in the seventh grade, 2.6% in the eighth grade and 4.4% in the ninth grade. Shannon entropy technique reported the importance coefficients of this attention level to be 69% in the seventh grade, 31% in the eighth grade and 67% in the ninth grade, which were below average level. The content analysis of the study showed that the attention level to productivity was 3.5% in the seventh grade, 2% in the eighth grade and 3.5% in the ninth grade. The Shannon entropy technique declared the coefficients of importance of these values to be 50% in the seventh grade, 26% in the eighth grade and 54% in the ninth grade, respectively. The level of attention to productivity in these curricula was evaluated to be below average level.

This content analysis showed that the attention to develop economic justice was 0.3 percent in the seventh grade, 0.9 percent in the eighth grade and zero in the ninth grade. Shannon entropy technique declared the importance coefficients of zero in the seventh grade, 0.009 in the eighth grade and zero in the ninth grade. These importance coefficients were evaluated to be at the lowest possible and unacceptable level. This study showed that the rate of attention to the business rules was 2.7 percent in the seventh grade, 1.3 percent in the eighth grade, 3.1 percent in the ninth grade. Shannon entropy technique declared the importance coefficients of to be 18% in the seventh grade, 22% in the eighth grade, and 57% in ninth grade, respectively, which were evaluated to be low. This analysis also showed that adherence to ethics and values was 1.6 percent in the seventh grade, 3.7 percent in the eighth grade and 3.5 percent in the ninth grade. Thus, Shannon entropy technique revealed the importance coefficients of adherence to ethics and values in economic relations to be 15% in the seventh grade, 37% in the eighth grade and 70% in the ninth grade. This level of attention was evaluated to be below average.

Practical recommendations

In order to understand professional skills, it was observed that significant mechanisms for economic-professional training were considered. In this regard, it is suggested that teachers pursue practical activities aimed at understanding professional skills through students' sustainable learning activities.

In order to teach professional ethics, which has been the second goal of economic-professional training, a list of student activities is proposed to be included in the future revision of the work and technology curriculum in which students record and evaluate the moral behavior they observe during school activities. This activity will be a prelude to turning a moral attitude into a moral behavior. In order to teach entrepreneurship, it is suggested that teachers design a table in work and technology curricula in which individual and group ideas of students are recorded in the field of entrepreneurship and is implemented during the week in the practical activities. In fact, the entrepreneurial process is implemented through training. In order to maintain and develop wealth, which has been the fourth goal of economic and professional education, the authors of work and technology textbooks are suggested to adopt self-training, so that more practical activities are considered for income-generating efforts by students to bring student-produced artifacts closer to an economic activity. Of course, in this regard, the support and guidance of school principals will be necessary. Another goal of economic-professional education has been to avoid idleness and unemployment. It was observed that almost appropriate mechanisms have been provided in the work and technology curriculum. In this regard, it is suggested to provide handicraft activities in the workshop and hold classrooms for students in the fields of maintenance and repair, handicrafts, installation services, construction services, and administrative services, so that students could participate in these businesses. These activities will be examples of avoiding idleness and unemployment.

In line with the sixth goal of economic and professional education, namely the observance of productivity, it was observed that the mechanisms provided in the work and technology curricula have been below average. In this regard, it is suggested that in the end-of-lessons assignments, exercises are considered in which practical activities related to productivity are experienced by the students, or at least, in practice, they visit manufacturing and service companies to observe and report all kinds of productivity. The development of economic justice has been the seventh goal of economic-professional education. In the textbooks of work and technology, the education level for this purpose is at the lowest possible level. In this regard, it is suggested that by providing mental and behavioral exercises in the curriculum, students should be guided to participate actively in the effort for economic justice. It is also suggested that in the school workshop, students take turns cooperating in membership management, supervision or responsibility to closely monitor the activities overseeing economic justice. In line with the eighth goal of economic and professional education, namely, observance of business laws, it was observed that various service and production rules were introduced in the work and technology curricula. But there were no acceptable mechanisms for complying with them. In this regard, it is suggested that in the end-of-lesson assignments, practical behavior based on the observance of business rules are considered so that students can record their objective observations of business rules in school and society and make group talks about them.

The ninth goal of economic and professional education was adherence to ethics and values. In work and technology curricula, addressing this goal was below average. In this regard, it is suggested that teachers consider complementary activities in which students participate in terms of mental and behavioral commitments. Students' active participation in activities related to the store, libraries, school expectation, school cleanliness, out-of-school journeys, field trips, and sports competitions can be good opportunities to practice adherence to ethics and values.

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