Content Analysis of Vocational and Technical Textbooks of Sixth and Seventh Grade Regarding Focus on Aspects of Technology

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Abstract

Objective: in this paper we tried to analyze the vocational and technical course books of sixth and seventh grades regarding technology factors.

Method: the research method used in this paper was content analysis with a quantitative approach. The research area includes vocational and technical course books of sixth and seventh grades of 2017-2018 academic year. In the analysis process the comparative coding based on five factors of technology was used. In this research the meaning unit is a sentence and the coding units are concepts and pictures of the textbooks.

Results: the findings showed that in the textbooks little attention has been paid to technology factors and in the pictures the focus has not been on developing technology factors. It is recommended that curriculum planners and officials pay more attention to technology development through school textbooks.

Conclusion: Based on the findings of this research it is recommended that educational organizations and officials pay a more comprehensive attention to technology factors, so that learners will be familiar with technology and will be able to adapt themselves with advanced technology and update their knowledge independently even after their courses are finished and be responsible in the society.

Keywords: Content Analysis, Vocational and Technical Textbooks, Sixth Grade, Seventh Grade, Technology

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Introduction

There is no doubt that in today's world knowledge is the foundation of power and wealth. The Supreme Leader referring to the hadith "Science is a king" العلم سلطان accentuated the importance of knowledge and this has been precisely clarified in the upstream documents of Islamic Republic of Iran such as perspective document, fourth and fifth development plans. Putting knowledge into practice and being eminent in the realm of technology is one of the main indices of development. Global Entrepreneurship Watch findings in developed or developing countries show that without paying sufficient attention to knowledge-based entrepreneurship it's not possible to have an active role in the international business or enjoy a stable position in the global competition (Talebi, Sanaeipour & Heidari, 2011). Science and technology parks have a vital role in this field.

In most dictionaries, technology is defined as a branch of knowledge that uses technical tools in life, society and environment and focuses on issues like production, transportation, energy and power, building, movie making, engineering, practical sciences and pure sciences. Understating technology is essential in today's modern world. In the world of technology and the present society, development and progress is growing nonstop so adapting knowledge with the increasing growth of technology is necessary and educational plans have to be compatible with the goals of technological literacy development. (Mckin, 2012) Teaching technology must expand the perception of the nature of technology, the relation between technology and society and designing technology. Through technology education students will understand technology in different fields such as: medicine, agriculture, energy, information and communication. In short, we can say that technology education must bring about the development of students' technological literacy in an extensive concept (International Association of Teaching Technology, 2006). In primary schools, students show a natural curiosity for science and technology and we can argue that most of primary school teachers don't have the ability to stimulate and develop this sense of curiosity in their students. As for the need of the society to engineers and technologists, it is necessary to know that if we stimulate students' (aging 10-12) attitude towards technology, it will affect their future with respect to choosing jobs (Boekaerts & Boscolo, 2002). An outstanding education needs the teachers' deep understanding of the importance of the subject and its structure. And they should completely understand different educational activities so that they will be able to help their students in comprehending the nature of the subject. In fact, understanding technology comprehensively and correctly is not sufficient, and the teacher's knowledge is important in teaching technology successfully. Little research has been done on the teacher's knowledge in teaching basic concepts of technology (Bransford, Brown, & Cocking, 2004). The relation between the teacher's mastery over the nature of knowledge and understanding of technology are important aspects of teaching technology (Parkinson, 2001). A complete awareness of the status of science production and technology at schools and research centers of the country can provide the necessary data or information to the managers and experts for future plans. Annual and regular evaluation of science and technology has the advantage that it can turn into a critical view and a research culture in the current situation of science and technology in schools and research centers. Therefore, school principals and research centers have always tried to expand research activities and technological subjects and they will attempt to provide the necessary conditions according to the indices (Hassanzadeh, 2005). As we mentioned above the increasing speed of information in communities makes it necessary for everyone to get familiar with information

technology and lifelong learning of technology and this can be achieved through technology education, and the required tools are the school textbooks. Therefore technology-based textbooks are needed. Paying attention to technology in textbooks helps people solve the problems they face in their lives independently.

Nowadays the important role of technology in life is clear and it is analyzed with respect to different variables. Of studies regarding technology in education are as follows (Means, 2010; Mohammadi, Yazdani, & Khoramabadi, 2011; Mohammadi, 2008; Mollayi Nezhad, 2007; Khosravi, Poshneh & Kiani Bakhtiyari, 2010; Sobhani Nezhad & Mollazehi, 2011; Samari & Atashak, 2008; Ghahramani Qajar, Mohammadi Doostdar & Ranjbar Noei, 2010), technology in higher education (Kalantari, Jafari, & Qoorchian, 2005; Samadi & Karimi, 2009; Saeedipoor, Eslampanah & Mohammadi, 2009), technology in educational organizations (Baqerpoor & Sattari Qohfarrokhi, 2010; Hajiamiri, 2013; Dehqani & Haqtalab, 2013), technology and managers (Asadifard, Tabatabaian, Bamdadsoofi & Taqva, 2012), public understanding of technology concepts (Qaneirad & Morshedi, 2011), technology and Islamic model (Taqavi, 2008), technology and development (Safavi & Safavi, 2002; Zaker Salehi, 2011), technology and politics (Qazinoori & Qazinoori, 2012), technology and sociology (Mahdizadeh & Tavakol, 2007), technology and science parks and knowledge based companies (Talebi, Sanaeipoor & Heyadri, 2011; Soleymani 2012; Tavalaei, & Taqiyareh, Masoomi, 2012; Salami, Behgozin & Shafie, 2011; Haeriyazdi, 2012; Akbarzadeh & Shafeizadeh, 2012; Mohammadi & Bigdelu, 2012; Nemati & Arasteh, 2006; Hajizadeh & Sardari, 2006; Davoodi, Shabanali Fomi, & Kalantari 2011; Poorezat, Khastar & Taheri Attar, 2009; Senobar, Salmani & Tajvidi 2011; Nemati & Yahyapoor, 2011; Bamdad , Farjadi & Riyahi, 2008; Nemati, 2012; Selseleh & Shariat, 2008; Hoseini, 2011; Qaffari, Sepeher & Seifi Inallu 2010; Sharifzadeh & Sharifi, 2006; Karimian Eqbal, 2001; Shahmiri, Nowruzi & Azarpad, 2010; Aqajani & Talebnezhad, 2011; Neqabi, Zaferian, Yusefi & Rezvani, 2012; Rezvani & Toghrayi, 2011), technology and commercialization (Baghdadi & Shaverdi 2012; Poorezat, Qolipoor & Nadikhanlu, 2010; Malekzadeh 2012; Economics Study Office, 2013).

According to the International Society for Technology in Education all students have to learn how to think critically, design and develop products, systems and environments to be able to solve problems practically (International Society for Technology in Education, 2006). Social institutions including the educational organizations have to prepare the groundwork for their members to form a correct relationship with the environment and others. This makes teaching civilians an essential factor that reflects the effectiveness of the educational system. In our country textbooks are basic components of the curriculum and 90 percent of students, teachers and school officials somehow need to deal with textbooks (Yarali, 2008). Now a question raises regarding the amount of attention paid to technology in textbooks. And focusing on technology in sixth and seventh grades is highly important because this period is simultaneous with the student's maturity in physical, logical and emotional aspects and according to Piaget's development stages and Kohlberg's stages of moral development enough attention must be paid to this issue. So the goal of the present study is to analyze technology focus in sixth and seventh grades textbooks, and we have tried to present a clear picture of the current status of focus on technology factors in textbooks and put forth the necessary insight for planners and officials in developing curriculums. We also have suggestions for better development of technological talent in students. In this study we want to answer the following questions:
-   How much attention is paid to aspects of technology in sixth and seventh grades textbooks?
-   How do the pictures in textbooks include aspects of technology?

Method

The method of this research is content analysis. Content analysis is a research method that is used to analyze and explain contents objectively, quantitatively and in an organized manner (Krippendroff, 2004; Berger, 1982). Although Kaplan emphasizes the quantitative aspect of content analysis (Yazarlu, 2005), Gal and Burg and Gal (2005) consider this as an objective and qualitative method suitable for describing content.

The research area includes vocational and technical textbooks of sixth and seventh grades in 2017-2018 academic year as the reliable sources. In this research the meaning unit is a sentence and the coding units are concepts and pictures of the textbooks. And concept refers to the conceptual meaning of the paragraphs of the books. To extract the frequency of the technology related concepts of the books first we extracted five factors of technology (technology education, commercialization of technology, science and technology parks and knowledge based companies, the necessity of technology education and setting up science parks and knowledge based companies and referring students to these parks and companies) and then the related markers were specified. To determine the validity the content analysis list, we used the content validity (experts' ideas). To do this we used a two-dimensional table, one dimension shows the factors of technology and the other one lessons of the textbooks based on the defined coding units.

Results

Question 1: How much attention is paid to aspects of technology in sixth and seventh grades textbooks?

Table 1 shows the amount of attention paid to technology in textbooks of sixth and seventh grades. Based on this table, in the text of sixth and seventh grades the focus is more on technology factors than other factors. But science parks and knowledge-based companies have not been addressed enough. In seventh grade textbook factors such as commercialization of technology, setting up science and technology parks and knowledge-based companies, and referring students to these parks and companies are addressed though very little but in sixth grade textbook these factors aren't mentioned.

Table 1. Technology factors in the text of sixth and seventh grades textbooks

	Sixth grade book	Seventh grade book
Technology education	1542	1400
Commercialization	0	9
Science and technology parks and knowledge-based companies	0	0
The necessity of technology education and setting up science parks and knowledge-based companies	0	35
Referring students to these parks and companies	0	8
Sum	1542	1452

Comparing technology factors in textbooks of sixth and seventh grade we see that technology education in sixth grade has the highest frequency and seventh grade book has the least frequency in terms of referring students to science parks and knowledge-based companies. On the other hand, in both books the least focus is on science parks and after that are technology education and referring students to parks (Chart 1.)
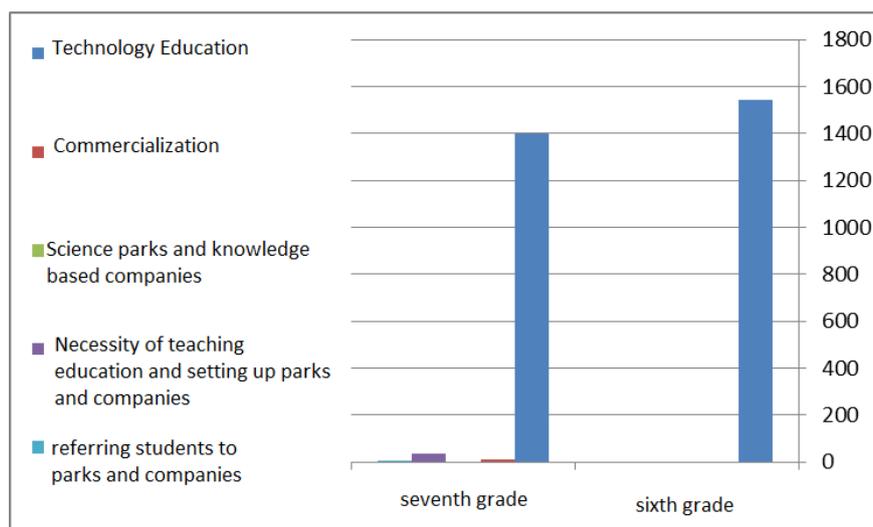
Chart 1. Technology factors in textbooks of sixth and seventh grades

Question 2. How do the pictures in textbooks include aspects of technology?

The descriptive data about the focus of the pictures on technology in vocational and technical books of sixth and seventh grades show that in these books pictures were not used about factors like science and technology parks and knowledge based companies, the necessity of setting up science parks and knowledge based companies and referring students to parks and knowledge based companies. On the other some hand pictures though being few were used regarding commercialization of technology and technology education (Table 2).

Table 2. Technology factors in pictures of sixth and seventh grades

	Sixth grade book	Seventh grade book
Technology education	1246	695
Commercialization	1	18
Science and technology parks and knowledge-based companies	0	0
The necessity of technology education and setting up science parks and knowledge-based companies	0	35
Referring students to these parks and companies	0	0
Sum	1247	713

Comparing the amount of attention paid to technology factors in sixth and seventh grades textbooks we can say that more attention has been paid to technology education. Sixth grade textbook has the most amount of attention regarding technology education and in this book commercialization has the least amount of attention.
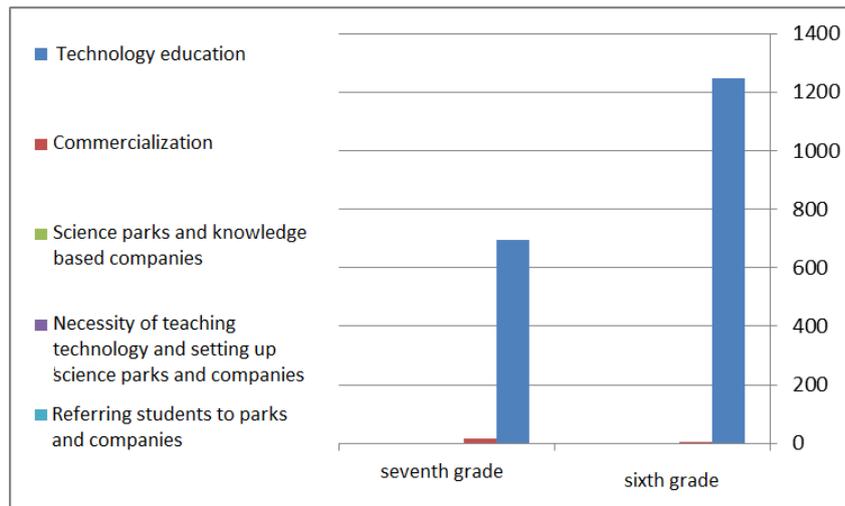
Chart 2. Factors of technology in pictures of textbooks in sixth and seventh grades

On the whole little attention has been paid in these books to develop different aspects of technology. Although the textbook of seventh grade enjoys little focus on technology, it has a more comprehensive attention to these factors than the sixth grade. But these factors are considered with a higher frequency is sixth grade book.

The results regarding technology factors in pictures showed that they aren't well presented in the textbooks. And it is clear that learning takes place better when the learners' different senses are stimulated and this learning will be deeper and long lasting. And visual problems and visual processing problems can lead to reading challenges and learning disorders (Facoetti, Lorusso, Gattaneo, Galli & Molteni, 2005; Sireteanu, Goertz, Bachert & Wandert, 2005; Plaza & Cohen, 2006; Jones, Branigan, & Kelly 2007; Kelly, Vanderschoot, Vasbiner, Horsley & Vanlieshout, 2008).

According to the findings of this research it is recommended that educational organizations and officials pay a more comprehensive attention to technology factors, so that learners will be familiar with technology and will be able to adapt themselves with advanced technology and update their knowledge independently even after their courses are finished. If fact for lifelong learning they won't depend on educational institutions anymore and they will be able to adjust themselves with the changes in technology with their basic knowledge.

Discussion and Conclusion

Nowadays people are dealing with various issues and events in their lives and they need to have a wide range of abilities and skills to satisfy their scientific, personal, social and vocational needs and to face the increasing changes of the world (Shadfar, Liaqatdar & Sharif, 2011). One of the most important institutions responsible for constructing these skills and abilities is the department of education. Schools have to familiarize the students with social, economic and technological developments and build in them skills that they can use in the learning age (Fallows & Stephen, 2000). Educational system uses the curriculum to make knowledge, skills, and attitudes. Curriculum includes all learning opportunities and experiences that are designed and implemented with the supervision and responsibility of educational system and with the goal of making desirable changes in learners' knowledge, skills and visions (Ahmadi, 1997). The experience of developed countries in twentieth century shows that the main axis of development is science and technology; and a much of the development of countries is evaluated based on technology (Khosravi, Phoshneh & Kiani Bakhtiyari, 2011).

Technology means using science and scientific findings in practice. Technology education has two main purposes: 1) preparing the youth for obtaining knowledge and continuing education; 2) Preparing them for future jobs and life (Technology Department of Razavi Khorasan Education Office, 2013). In recent years science production has made remarkable progress in universities and research institutions but it has an incomplete relation with industry that led to a sharpening gap between science and practice (in fact universities and industries) and one of the things that the educational system can focus on in bridging this gap is technology education from first grades to higher education (Khosravi, Phoshneh & Kiani Bakhtiyari, 2011). Since in the educational system of our country textbooks are a main element of curriculum, designing and development of their contents must take place in a way to make sure that all students' various talents are considered and they could be in tune with today's changing and advanced world of technology.

Nevertheless, findings of the present research showed that in the textbook of vocational and technical course of sixth and seventh grades, the sixth grade has a more frequency (1542) than seventh grade (1400). But in the textbook of seventh grades factors such as commercialization of technology (f=9), the necessity of technology education and setting up science parks and knowledge-based companies (f=35) and referring students to science parks and companies (f=8) are considered while these factors are mentioned in sixth grade. With respect to the pictures sixth grade also has a more frequency (f=1246) than seventh (f=695). And both books have paid little attention to commercialization seventh grade (f=18) and sixth grade (f=1). And other factors are not considered. We didn't find a research analyzing technology factors in primary school textbooks. Since no research has been done related the topic of this paper it has no consistency with national and international literature.

Based on the findings of this research it is recommended that educational organizations and officials pay a more comprehensive attention to technology factors, so that learners will be familiar with technology and will be able to adapt themselves with advanced technology and update their knowledge independently even after their courses are finished and be responsible in the society. In fact for lifelong learning they won't depend on educational institutions anymore and will be able to adjust themselves with the changes in technology by using their basic knowledge.

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