THE STUDY ON PRODUCTION OF ELECTRONIC CONTENT AMONG SECONDARY EDUCATION TEACHERS IN OFFICE OF EDUCATION IN BUKAN CITY

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ABSTRACT
This research aimed to study the products of electronic content among secondary education teachers in BUKAN education stuff. The research method was descriptive - survey. All Electronic content software that was developed by teachers in 1393 that was 34 electronic contents evaluated. All software based on the seven Meyer researcher made checklist list was examined. Reliability of research tool was 0.866 in Cronbach alpha and Validity of checklists was approved by university professors before the execution was confirmed. Results showed that the principle of multimedia and the principle of solidarity were higher than expected. But the amount of attention to the principle of neighborliness, the principle of redundancy, personalization principle and the practice principal among seven principles Meyer were below the expected standard.

Keywords: Multimedia, Meyer Seven Principles, Electronic Content, Content Design

INTRODUCTION
E-learning has been considered as a new approach in representing learning, interactive and learning-based environment for everyone at any place and time with use of resources and features of different digital technologies in line with other forms of e-learning and technology-based learning. The term "e-learning" encompasses a large list of applications and functions including offline learning through CD, Web based learning, Internet based learning, Computer based learning, Electronic Performance Support System, technology-based learning, Online learning, Distance learning, Virtual learning and Distance education. This definition is based on how to represent issues through electronic media. In online e-learning environment, the learners with any level of information can have access to a higher level of information and engage in learning via different learning tools from different regions of the world at different times, yet they are using different network techniques and attending among other learners simultaneously and non-simultaneously (Moradi et al., 2004). Use of multimedia software about educational issues has been regarded as one of the modern methods for use of information and communication technology to increase educational yield. There is not standard software with favorable educational content in all the educational issues, thus, the instructors are required to start working at the area of production of multimedia educational content. Multimedia software refers to applied software which is designed and produced under web or on CD to achieve an educational aim, called as multimedia e-content. This software have been called multimedia software due to use of different media such as text, images, audio, video in producing them, and the learning through use of electronic software and hardware is called e-learning (Kardan & Ahmadi, 2007). Educational software through electronic content including educational resources, virtual environments and interactive communication are formulated in a way to let the student to attend in virtual classroom for several times instead of once (Elahian & Khazaei, 2011). Meyer's seven principles has been assumed as one of the most comprehensive principles for multimedia design, including multimedia, coherence, redundancy, contiguity, modality, customization and training principles (Mortazavi & Rahmani, 2012). Regarded to multimedia principle, it requires using both audio and video media in educational content. In temporal contiguity principle, two objects which are connected to each other must appear in the screen together, so that the long time interval must not exist in their emergence. With regard to temporal contiguity principle, two or several objects which make a unique content are required setting in a close space to each other. More specifically, it requires detecting...
contiguity between the contents via line, color and any other factor, so that the viewer is not confused in a certain screen. In sensory channels principle, senses of sight and hearing must be used to stimulate the simultaneous sensory channels, yet reading the text represented in the screen is not allowed. In individual differences principle, it requires designing the produced content in a way the person enables to have progress at the considered area based on his learning, that is, the person ends the educational course sooner or later. With regard to redundancy principle, attention to entertainment programs, additional noise, attractive graphics and so forth which cause representing more interesting designed content is not required (Meyer, 2011). E-learning has been already arrived at education system, thus, formulation of suitable principles and standards to evaluate e-learning has been mentioned necessary to resolve the major problems at this area of learning. Personal experiences indicate that the instructors provide large number of e-learning contents in different festivals and programs per year, that evaluation, supervision and representation of feedback to the producers of this software require practical and scientific actions. The present research has been found suitable to assist for evaluation of the instructors' produced contents and their qualitative improvement in line with users' individual learning. Further, in most cases, the produced electronic content is evaluated by the instructors at computer group and the prepared forms with the suitable form and appearance. While, attention to the proposed content and the methods proposed through content and attention to the principles of curriculum and educational psychology and other factors which must be drawn into attention are required, while these factors have not been found in the produced content evaluation forms. In this regards, attention to the winners in electronic content festivals indicates that the e-learning software is enriched in sake of form and content, while it is prevailed with serious problems in sake of observing psychological principles and managing the cognitive load on the learners' brains. However, the studies in the context of smart schools and their requirements including electronic content and its design in Iran have not a long record, few internal and external studies have been conducted, mentioned as follows:

Avaz Zadeh (2010) & Mortazavi & Rahmani (2012) evaluated the extent of attention to contiguity principle in the examined contents at average level and the level above average. Brown and Green (2006) suggested several methods for facilitation and proliferation of use of text, graphics, image and audio. Multimedia facilities and capabilities of electronic technologies allow the providers of electronic content to provide the learning concepts and principles in form of colors for shapes, charts, etc to the learner. These conditions pave the way for acquiring multi-sensory learning experience for the learner, and this multi-sensory experience results in improving quality of learning (Zheng and Zhou, 2006). Further, the nature and how to organize texts and relational structure of texts have been subjected to fundamental developments that much of these capabilities are dependent on services and facilities which have been provided by the designers of educational systems through information and communication technologies (Bates & Bates, 2007).

From point of view of Masoomi (2007), evaluating and giving feedback are of great importance, because the knowledge from results of feedbacks is used to evaluate the acquired knowledge and modify and improve educational contents. From point of view of Atarran (2004), resolving the class practices has been found as a way to improve and strengthen the learners' intrinsic motivations, because internal motivation depends on the factors that are institutionalized in the person inherently, including feeling of success or failure in response to the classroom questions and practices. Yet, extrinsic motivation associates to the factors not related to the person, acquired through encouraging and punishing the person by other individuals.

Avaz Zadeh (2010) in a research examined the extent to which the content of educational multimedia in English lesson at second grade of secondary school adapts with aims of official curriculum and Meyer's seven principles and concluded that the produced multimedia by educational technology office adapt with the aforementioned principles.

Kardan & Behbahani (2009) has examined providing electronic content for virtual courses and concluded that attention to important educational elements for familiarizing with virtual learning and developing a specialized tea for design and production of electronic content of virtual courses can provide an effective...
electronic content for learning. Shah Jafari (2006) believed that formulation of the criteria for evaluation can improve the educational multimedia in line with development of learning-teaching principles. Mortazavi & Rahmani (2012) examined the extent to which educational content of Persian lesson adapts with Meyer's multimedia principles and concluded that the extent to which this content adapted with contiguity and redundancy has been at favorable state, and the extent to which this content adapted with individual differences has been at unfavorable state. Through investigating the teaching strategies and how to propose content in internet educational sites, it is specified that a particular attention has not been paid to the learning-teaching process in most of them and type, quality of content and type of learning intervention have not been elaborated precisely (Childs et al., 2010). Since there are few related works on electronic content throughout the country, paying attention to evaluation of curriculum in electronic content has been mentioned as the significance of the present research. With regard to what mentioned above, the present research aims to examine productions of electronic content in Secondary Education within education system of Bukan City using Meyer's seven principles.

**Research Method**

Research method was descriptive survey, since the present research evaluates existing status of the provided software, evaluation can be known as the approach used in the present research (Bazargan, 2008). The statistical population consists of all softwares in Bukan City in form of festival of electronic content during 2014. Since there have been limited number of software, census method was used and sampling was not determined.

**Data Collection Method and Tools**

To measure the research variables, a researcher-made questionnaire consisting of seven components was formulated, and this questionnaire for each of the designed software was filled by an instructor specialized in teaching and an expert specialized in computer through an emphasis on electronic content and one of the professors at the area of education, and mean of score for these three individuals at each of principles was considered as the score for that principle. Six questions have been considered in the questionnaire for each of the questions of research that each one has three items (yes, relatively, no) to which scores 3, 2, 1 were given. Score of each of principles includes sum of score of six questions pertaining to that principle in the questionnaire, ranging from six to eighteen. For data collection, after confirming validity and reliability of measurement tools, all the software and electronic content of the instructors at secondary grade during 2014 were received from the information technology sector in education system of Bukan City. To examine validity of questionnaire, the questionnaire and its structure together with Meyer's seven principles were given to three faculty members of Payame Noor University and Islamic Azad University of Boukan at the fields of psychology and educational sciences so as to consider the extent to which the questions are valid. Results from points of view indicated that there has been a huge agreement on most of questions. Some corrections were received about four questions of questionnaire that were applied in the final version of questionnaire. Further, reliability of questionnaire via Cronbach's alpha was calculated to 0.866. One-sample t-test was used to analyze data so as to compare the existing level for attention to the seven principles with average value (12). Further, reliability of questionnaire was measured and calculated via Cronbach's alpha via software SPSS.

**RESULTS AND DISCUSSION**

**Findings**

Results indicated that 32 softwares have been examined by the instructors at Secondary Education in Bukan City in the electronic content festival. The largest number of software has produced in English language and technology fields. To examine the research questions, the scores of each principle were compared regarding one-sample t-test.
Null Hypothesis

With regard to the results from table 1, mean of the obtained scores to examine multimedia principle in 32 softwares is 12.25 and standard deviation is 1. T-value equaled to 2 which is significant at (P<0.05). In other words, this principle has been conducted higher than the criterion (figure 1).

![Boxplot of multimedia](image)

**Figure 1: Box Plot for Comparison of Mean and Median of the Multimedia Principle Regarding the Null Hypothesis**

With regard to the results from table 1, mean of the obtained scores to examine contiguity in 32 softwares equaled to 10.19 and the standard deviation equaled to 1. T-value equaled to -4 which is significant at sig (0.01). In other words, it can say that observance of this principle is lower than average level. As seen in figure 2, the mean is lower than the midpoint of the distribution criterion to 1.81.

![Boxplot of contiguity](image)

**Figure 2: Box Plot for Comparison of Mean and Median of the Modality Principle Regarding the Null Hypothesis**

As seen in table 1, mean of multimedia principle in 32 softwares is 12.25 and standard deviation is 1. T-value equaled to 2 which is significant at (P<0.05). In other words, this principle has been conducted higher than the criterion (figure 1).
sig (0.01). In other words, it can say that observance of this principle is lower than average level. As seen in figure 3, the mean is lower than the midpoint of the distribution criterion to 3.16.

![Boxplot of modality](image)

**Figure 3: Box Plot for Comparison of Mean and Median of the Modality Principle**

With regard to the results from table 1, mean of the obtained scores to examine modality in 32 softwares is 11.3 and the standard deviation equaled to 1.71. T-value equaled to -2 which is significant at sig (0.01). In other words, it can say that observance of this principle is lower than average level. As seen in figure 4, the mean is higher than the midpoint of the distribution criterion to 0.7.

![Boxplot of redundancy](image)

**Figure 4: Box Plot for Comparison of Mean and Median of the Redundancy Principle Regarding the Null Hypothesis**

With regard to the results from table 1, mean of the obtained scores to examine modality in 32 softwares equaled to 14.5 and the standard deviation equaled to 2.048. T-value equaled to 7 which is significant at sig (0.01). In other words, it can say that observance of this principle is higher than average level. As seen in figure 5, the mean is higher than the midpoint of the distribution criterion to 2.5.

![Boxplot of coherence](image)

**Figure 5: Box Plot for Comparison of Mean and Median of the Redundancy Principle**
With regard to the results from table 1, mean of the obtained scores to examine modality in 32 softwares equaled to 5.06 and the standard deviation equaled to 1.16. T-value equaled to which is significant at sig (0.01). In other words, it can say that observance of this principle is lower than average level. As seen in figure 6, the mean is higher than the midpoint of the distribution to 5.06.

![Boxplot of costumization](image)

**Figure 6: Box Plot for Comparison of Mean and Median of the Customization Principle Regarding the Null Hypothesis**

With regard to the results from table 1, mean of the obtained scores to examine modality in 32 softwares equaled to 10.47 and the standard deviation equaled to 1.7. T-value equaled to which is significant at sig (0.01). In other words, it can say that observance of this principle is lower than average level. As seen in figure 7, the mean is lower than the midpoint of the distribution to 1.55.

![Boxplot of training](image)

**Figure 7: Box Plot for Comparison of Mean and Median of the Training Principle Regarding the Null Hypothesis**

**Discussion and Conclusion**

The present research has aimed to evaluation of electronic content production in sake of Meyer's seven principles in Secondary Education of Bukan City. The results from overview of observance of multimedia, coherence, redundancy principles in production of electronic content in Secondary Education indicated that the calculated mean for these principles is higher than the considered criterion, and this difference has been significant. Attention to multimedia principle puts an emphasis on this point that eyesight in addition to hearing has been considered and text messages have been transferred to the learners via color, text, image, video, and chart so as to deepen the learning. These results are consistent with Shah Jafari (2006), Avaz Zadeh (2010), Mortazavi & Rahmani (2012), Zheng and Zhou (2006). Further, multi-sensory learning experience and coordinating text, graphics and voice in computer software can increase enrichment of students' experiences. Since the instructors use different senses in their classes to deepen learners' knowledge, this principle has been observed in produced software. In redundancy principle, an emphasis has been put on avoidance from procurement of the contents such as music in text.

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and interesting cartons. A particular attention must be paid to the factors such as quality of courses, observance of learning principles, and observance of software standards and management of production of electronic content in production of electronic content. Educational concepts and media must specify learning through providing an interesting and persuasive environment for learning (Kardan & Ahmadi, 2007). Some studies have shown that more attention to lateral factors including music, background, animation, carton affects the process of learning the major message of lesson. Hence, results of the present research have shown that a little attention has been paid to this principle, indicating producers of software have a suitable performance in this context. Further, coherence principle refers to integration of voice, text and image to achieve an aim; since instructors have paid attention to coherence of educational plans in educational experiences, they have observed this principle properly in design of electronic productions and mean of observance of this feature among the designed software has been at a high level. These results are consistent with the findings of Shah Jafari (2006), Avaz Zadeh (2010), Mortazavi & Rahmani (2012), Zheng and Zhou (2006). Seraji & Shahbazi (2011) stated that revision in educational view is required to use the potential abilities of e-learning, for which a particular attention must be paid to coherence of content. On the other hand, results from overview of the extent to which multimedia, coherence, redundancy, contiguity, modality, customization and training principles indicated that the calculated mean for these principles is under the considered standard, and this difference has been significant. In contiguity principle, the relationship between elements is considered, and the visual relationship between the objects embedded in a page requires observance of contiguity. It might say that instructors have huge experiences about writing on whiteboard and blackboard, and these experiences have put emphasis on contiguity principles, transferred to the multimedia and virtual environment. Modality principle puts an emphasis on this point that a priority must be given to one sense with an emphasis on hearing in designing multimedia in education. In other words, if one can write a message and transfer the voice, the priority will be given to the voice. Different studies have put emphasis on significance of emphasis on one of the senses in design of electronic content, thus results from the present research are consistent with the results from Karim Zadegan (2009), Brown and Green (2006), Avaz Zadeh (2010), Mortazavi & Rahmani (2012). To sum up, it seems that giving priority to audio relationship in some messages causes reduction in brain's cognitive load, whereby this assists for improving learning. Customization principle refers to a process that paying attention to it causes creating the individual sense to the electronic content software. These skills include attention to quoting sentences in the first person singular, electronic program guides, attention to dialogue between the first and second person, avoidance from use of the third person, use of spoken language. These techniques cause the learner assumes being in a virtual environment guided by the individuals around him. Hence, it can say that inattention to this important point has been regarded as one of the weaknesses in the designed software by the instructors, to which a particular attention must be paid. Hence, it can say that results of the present research are in conflict of interest with the studies which have put emphasis on customization principle, including the studies by Avaz Zadeh (2010), Mortazavi & Rahmani (2012), Kay and Nag (2008), Lee (2009), Elahian & Kharazi (2011). A reason for low score of customization principle has lied on this fact that a particular attention has not been paid to this principle by the instructors in the educational classes held to familiarization with design of multimedia software. According to Kay and Nag (2008), the conditions to design content especially at electronic environments provide different representation methods for the learner so as to select his/her cognitive and emotional features and preferences based on the style (Kay and Nag, 2008). According to Elahian & Kharazi (2011), some standards must be determined to achieve learning aims so as to specify the process of design of content and assist the learners. This is in a way that the priority has been given to attention to personal characteristics of the learners who interact with the program (Elahian & Kharazi, 2011). Further, Lee (2009) knew the self-learning as the major aim for interaction with electronic content, so that how to represent feedbacks plays a major role in electronic content. In training principle, attention has been paid to the practices for reviewing and testing the learners' knowledge. Since practice and resolving problem have been considered as inseparable parts of classroom, it was expected that the instructors pay attention
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to this principle. This is in a way that the level of attention to this principle in the designed contents has been lower than considered value. To elaborate this finding, complicatedness of design of pages with practices can be found as one of the reasons. Further, designing question has been assumed as a more complicated process than writing text. On the other hand, it must pay a particular attention to this point that most of examined software have been provided with a part to ask question and give feedback to the students, yet a particular attention has not been paid to the result of questions pertaining to this principle. Yet, the researchers including Masoomi (2007), Ataran (2004), Avaz Zadeh (2010), Mortazavi & Rahmani (2012) have put a huge emphasis to significance of practice, question and feedback in electronic content, which this is consistent with the findings of research. Since a suitable attention has been paid to multimedia, coherence and redundancy principles, common methods have enabled to attract the designers of content and instructors to pay attention to these principles and sustain on them. Further, since the extent to which attention has been paid to multimedia, coherence, redundancy, contiguity, modality, customization and training principles has been low, thus it is suggested to pay more attention by the instructors and designers of electronic content to these principles. Further, the researchers are suggested to pay attention to reasons for why little attention has been paid to these principles in other studies regarding little extent of attention to modality and customization principles and consider the extent to which these principles have been considered in experimental research so as to examine its effect on learners' learning compared to the software which has not paid attention to observance of these principles.

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