The Effects of Blended Learning and a WebQuest Learning Designed based on the Merrill Instructional Design Model for Children's Learning

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Abstract

The present study aimed to investigate the effects of blended learning as well as a WebQuest learning designed based on the Merrill Instructional Design Model, on children's learning at a hospital in Iran. The research method is a quasi-experimental with a pre-test and post-test. The population consisted of all children aged 6 to 10 years old. Using simple random sampling, 23 students were selected but only 20 children were able to participate in the research. The research tool was Ali and McKinsey's Learning Measurement Questionnaire (2001) with 8 components and 43 items. The validity and reliability of this questionnaire reported in Ali and McKinsey's Questionnaire (2001) were 0.77 and 0.85 respectively. The validity of the questionnaire was verified by the experts in the field of education as well as the supervisor and the reliability of the questionnaire, using Cronbach's alpha was 0.73. For data analysis, descriptive statistics (means and standard deviations) and inferential statistics (multivariate covariance analysis and chi-squared test) were used. The results showed that there was no difference between WebQuest and the blended learning in the components of high efforts, social strengths and motivation, academic continuity, academic motivation, rewards and overall learning scores. However, there was a significant difference between the amount of children's learning with cancer by WebQuest learning as well as blended learning environment in terms of free conditions, competition and social interest.

Keywords: Education, WebQuest; Blended learning; Instructional design; Learning; Mahak

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Introduction

The most important and effective thing that can help us, in harmony with human changes and developments, is learning through education (Khoshneshin, 2013). Today, the growth and development of knowledge and learning of students through effective education and designing education through effective approaches have provided an important part of the educational and pedagogical success of children (Meshkani, Akbari Fazaeligah, 2015; Rahbaradar and Fardanesh, 2012). Instructional design is becoming increasingly important as part of students` education with the aim of changing or modifying knowledge, ability, attitude and, finally, behavioral change and improvement of their performance in the field of learning (Samadzadeh, 2010). Training which is appropriate to the real needs of children is efficient and effective, and is of interest to all professionals and experts in the field of education and learning (Behpazhouh, 2017). In fact, by observing the principles of learning and applying appropriate teaching patterns in this field, we hope that qualitative features in educational courses can be improved and the goals can be set for the proper learning of children (William and Jacobs, 2016).

Instructional design is a teaching and training tool that makes the teaching materials more effective and efficient (Ghasim Samani et al., 2016). The educational designwhether it relates to a full course or one session is of particular importance. Attention and careful adjustment can lead to an efficient and effective teaching (Salimi & Ramezani, 2014). Instructional design is one of the most important prerequisites that must be followed by the teacher. Because observing these backgrounds leads teachers to have a regular and consistent coordination of course in the process of teaching lesson content (Keshmiri and Momenirad, 2015). In general, the purpose of instructional design is to provide learning facilities (Motavalli and Yaghoubi, 2013). There are a variety of instructional design models. One of the most effective patterns of cognitive learning design is Merrill's model which describes the presentation and arrangement of educational components in the most beautiful form in terms of subject, concept, and rule (Dehghanzadeh et al., 2016). This pattern, using the expected final functions, transmits the level of functions to the highest level, including discovering and inventing, as well as identifying the way to achieve these functions for a variety of topics and concepts (Florence & AStoicescu, 2014). Two of the main components of instructional design are approaches and appropriate teaching patterns because both form the basis of education and learning (Fazeli & Karami, 2015).

One of the best ways to teach is modern educational method that is now highly supported by advanced educational systems (Mashhadi Jafarloo and Ali Hosseinzadeh, 2016); There are many new educational methods that are being used according to the conditions of learning environment and the content of the curriculum. One of these new educational methods is WebQuest. WebQuest is an online tool through which we can learn from the Internet and web pages (Zarabian, 2018). Teachers can design new WebQuests related to any subject of the courses, or they can use the WebQuests available on the Internet (Miri Rameshe, 2013). WebQuest-based learning begins when students answer to questions, solve problems, or present a set of observations (Badeleh and Sabeti, 2017). WebQuest is a structure of learning scaffoldings that uses links to access essential resources on the Internet. In other words, WebQuest encourages learning at the highest level and provides educators and teachers with the aid of numerous creative ways to provide guidance and specialization for learning (Bank and Graham, 2014). This methodology is an authoritative activity to stimulate the learner's sense of research to answer a basic and open question, develop individual skills and participate in a final working group process that seeks to shape new information for a deeper understanding (Sajadi hazaveh and Barimnejad, 2011). In fact, WebQuest is an innovative, learner-centric approach based on effort-seeking and learning-seeking activities that utilize computer technology to engage learners individually or collaboratively to search, analyze, and combine data to build new knowledge or meaning (Gaskill, 2016). In this way, students learn to work in a collaborative environment and seek information that is relevant to their areas of studies (Feyzi, MesrAbadi and Zavar, 2014). Students are responsible for their learning and use technology to complete their tasks and activities (Gardner, 2011). WebQuest teaching includes learning principles and cognitive activities such as collaborative learning, scaffolding learning, problem solving, modeling learning and thinking, objective assessment, social and cognitive learning, active learning, as well as motivation enhancement (Seifi et al., 2017). It also improves the learning and retention of high-level thinking skills that include content thinking, critical thinking and creative thinking (Mohammadi Mehr, 2014). Dodge believes that the thinking skills that may be used in WebQuest include comparing, classifying, inducing, analyzing errors, defending ideas, abstracting, and analyzing opinions (Hoffman et al., 2016).

In general, WebQuests, while providing a structure and guidance for learners, helps students focus their minds on the resources provided by their instructors instead of focusing on the search for resources (Badeleh and Sabeti, 2017)., The educational contents are designed to strengthen critical thinking and collaborative learning approaches as well as in situations where learners gain teamwork skills in a variety of social environments, engage in problem-solving activity, or formulate information and use the acquired knowledge (Samimi et al., 2016).

Another new learning method is blended learning (Zarei, Mirshah Jafari and Liyaghatdar, 2017). Blended learning combines learning environments by creating synchronous and asynchronous learning as well as by providing a space in which the strengths of both traditional and electronic teaching methods are used to achieve better learning (Mahmoudi,

Moghaddasi and Rezazadeh, 2016). In this educational environment, participation, creativity, self-reliance, and the search for answers without teacher assistance and, most importantly, learning pleasure is provided and the environment is fully provided for active participation of students in the learning process (Halpern & Hakel, 2015). Blended learning is a combination of different communication tools with technologies such as e-learning, e-support, performance, and knowledge management methods that are very useful for providing useful instruction (Akuz & Samsa, 2016).

In blended learning, learners are only being trained to the extent they can work more efficiently in learning (Salehi Emran and Salari, 2012). In blended learning, learners can select activities that suit their speed, level, and style in learning (Mousavi, Razavi, and Rahimidost, 2018). In addition to virtual environments, they can also attend real classroom environments and enhance their social skills, independence and self-esteem (Standen & Bravn, 2012). They can be guided in decision making, creative thinking, and critical thinking, explore issues that they are faced with in learning and real life (Abdullah Zadeh, 2013).

In this way, students can accept various activities and responsibilities according to their own abilities and have various resourcessuch as the Internet and libraries for exploration, which enhance the communication skills of students. Consequently, students' language communication will be strengthened (Golmohammadnejad Bahrami, 2018). This is the reason why the blended learning method is emphasized. The key to blended learning is to choose the right combination of materials and teaching methods that have the most impact with minimal cost (Hosseini & Firoozjaeian, 2014). Applying the blended approach to education gives children the freedom of actions, and the broader insights into the use of educational tools and environments (Salmon, 2016).

In a study by Zarrabian (2018), the effects of the combination of retention-blended learning method on learning that motivate and create interest in anatomy lessons in students. It was concluded that the blended method on academic achievement and motivation in the anatomy course had a significant impact. Among motivation components, based on the mean difference in the pre-test and post-test of the experimental group, the blended learning on long-term resistance had the most effect on the components of motivation and had no effect on the three components of time perception, providence and attention to the criterion of competence in choosing a friend.

In a study by Azizi Alavijeh and Zarrabian (2018) examined the effects of two methods of retention-blended learning (mobile and network based) on learning of social education concepts., They concluded that in the history section and social education, the researcher-made method of booklet made by phone was more effective than the blog and forum method However, in the geography lesson, the blogging method and forum and mobile booklet did not differ significantly in terms of academic achievements.Both methods were considered effective. In a study by Dehqanzadeh et al. (2017) that compared the effectiveness of Merill's four-component instructional design modelwith the conventional method in student learning, it was concluded that the difference between the traditional education groups and the four-component Merill's nstructional design models was meaningful with 95% confidence. Thus, the Merrill instructional design model was more effective in learning the science lesson (teaching complex subject).

Sahin and Baturay (2016) examined the effects of the E5 learning model using WebQuests on students' success and satisfactions, and they concluded that the E5 learning model supported by WebQuests would enhance students 'success, and the training provided to students through this environment would increase students' success. In another study, Zareh et al. (2016) examine the effect of the shape and model of instructional design on the motivation and academic achievement of learners with Attention Deficit Hyperactivity Disorder (ADHD) concluded that E-learning increased educational motivation, and education based on the Gagne and Briggs Instructional design model in electronic form led to the academic achievement of learners with ADHD. In a study by Gorgi (1395), the impact of using WebQuests on classroom performance, critical thinking attitudes and problem-solving skills of high school students was examined He concluded that the use of WebQuests in comparison with the lecture method had more effects on the curriculum, the tendency to critical thinking and problem-solving skills of the male middle school students in science lessons of Mashhad Kaveh.

In a research conducted by Ajam (2015) who was examining the viewpoints of faculty members of Payam Noor University on the blended learning

approach based on individual variables and computer skill levels, it concluded that faculty members had a consistent view of the blended learning approach at Payame or Payam? Noor University. There was a significant difference between the faculty members` viewpoints on the blended learning approach based on gender., However, faculty members' viewpoints regarding the blended learning approach in terms of academic degree, teaching experience and computer skills were not significantly different. No significant difference was found between the computer skills of faculty members and their viewpoints on the blended learning approach.

Göktepe (2014) in his study examined the impact of WebQuest on mathematical education and he concluded that teaching by WebQuest method had a positive role in the emotional and cognitive abilities of learning environments. In a study conducted by Mahdavi and Amirteimori (2011) with the aim of investigating the effects of the use of Merrill's Instructional Design model (component theory) on students' learning and motivation for progressing, it was concluded that the learning level of students trained through the Merrill's Instructional Design model was higher than those trained traditionally. Moreover, there was no significant difference in the students` achievement motivation level in the two groups.

According to the results of previous researches, the use of blended learning method and WebQuest training in teaching ordinary students increases their learning, and due to providing educational content in different ways, their motivation and willingness increases. Increasing motivation will increase students' self-efficacy, which will increase students' activities and dynamism in their classrooms. Blended learning methods and WebQuest training have been widely studied in terms of their impacts on different educational and mental dimensions of ordinary students. However, the impact of these educational methods on the especial students' learning such as cancer children has not been investigated. Cancer children are people who are not physically fit and kept in special places such as hospitals. Mahak Hospital is a specialized center for research treatment in the field of child cancer in the Middle East, which is the result of the great participation of Iranians. The abbreviated name (where is the abbreviation?) is based on the type of activity of this institute (the institute for childhood cancer protection). The logo is a leaf that is a symbol of life, and on which the child and his family hopefully stand. Mahak is always trying to keep children happy and provide hopeful stages of treatment with the aim of preserving the human dignity of children with cancer and families, and the family only thinks about the health of their child (Jafarian, 2017). The missions of this organization are to support children with cancer and their families in the supportive sector, treat children with cancer in Iran in an integrated manner in the framework of national, international standards and the patients' rights charter, utilize the latest and most effective methods and latest achievements in medical science, establish a research center for cancer research, identify the causes of the disease, diagnosis, screening, prevention and new methods of treatment. (Moradi, 2017). Therefore, the present study aimed at examining the impact of WebQuests teaching methods and blended learning environment based on the Merrill's Instructional Design model on children's learning' learning aged 6-10 years in Mahak Hospital. The research questions are as follows:

- Does WebQuest training based on Merrill Instructional design model has an influence on the learning of children aged 6 to 10 years in the Mahak hospital?;
- Does training by blended learning environment based on Merrill's Instructional Design model has an influence on the learning of children aged 6 to 10 years in the Mahak hospital? and
- Is there a difference between the effects of WebQuest training and the combined learning environment based on the Merrill's Instructional Design model on the learning of 6 to 10-year-old children in Mahak Hospital?

Methodology

The study adopted a quasi-experimental approach with a pre-test and a post-test design. The population of this study consisted of all children aged 6 to 10 years old in Mahak Hospital in Tehran. Using a simple random sampling, 23 students were selected. After talking to their parents and expressing how the research would be conducted, 20 children finally participated in the research. The research tool was a learning assessment survey. The questionnaire was compiled by Ali and McKinsey (2001), which contained 43 items and 8 components: free conditions and students` motivation in doing homework, meaning doing optional and motivating homework (4

items); the high efforts on difficult materials (7 items); competitiveness and comparison of their academic performance with other students and their progression (6 items); social power and student motivation for supervising and leadership of group (6 items); obtaining coherence and teamwork in the field of education (3 items); social interest and student`s motivation for helping and paying attention to academic achievement of others (5 items); the student's motivation to study and encourage others to study (5 items), and the student's motivation to appreciate and receive a reward for studying (7 items). The validity and reliability of this questionnaire in Ali and McKinsey's (2001) research was reported 0.77 and 0.85, respectively.

The method of this study was to classify children aged 6 to 10 years old based on their age, gender and physical and psychological status in equal numbers in the first two experimental groups (children under the training of WebQuest method based on Merrill's Instructional Design model) and the second (children under the training of blended learning environment based on the Merrill's Instructional Design model). Then, the learning rate of children aged 6 to 10 years in Mahak Hospital in the first part, two experimental groups (children under the training of WebQuest method based on Merrill's Instructional Design model), and the second part, children under the training of blended learning environment based on the Merrill's instructional Design model) was evaluated using the learning measurement questionnaire of Ali and McKinsey (2001). Scores obtained at this stage were considered as pre-test scores for both groups. As stated above, a practical WebQuest learning curriculum design based on Merrill's Instructional Design model was initiated in the form of a practical and revised daily lesson plan. For this, as in previous, the lesson plans were designed according to Merrill's Instructional Design model. The lesson plans designed for WebQuest training were based on Merrill model that included six steps of introduction, assignment, process, resources, evaluation, and outcome. In the lesson plan, functional levels were also considered based on Merrill model, which included reminders, applications, discoveries and innovations. It should be noted that WebQuest training content based on Merrill's model included facts, concepts, methods and principles or rules. In the following, WebQuest Merrill's instructional design model was initially carried out to train the children aged 6 to 10 in the first experimental group. Finally, WebQuest training using the Merrill's Instructional Design Model was conducted in the form of a daily lesson plan, during 5 sessions (45 minutes/session) for 6- to 10-year-old cancer patients in the first experimental group (children under the training of WebQuest based on Merrill's Instructional Design model).

Table 1: Description of the sessions of the Implementation of the Training in the Form of WebQuest

Number of sessions	Name of the Course	Grade and Page	Description of the sessions	Time	Feedback	Media
First Session	Healthy Water Healthy Air	Second Grade (pages 16-22)	1.Teaching the importance of recognition of healthy air and water. 2.Teaching the methods of collecting data in the field of healthy air and water from the related websites and the method of categorizing the collected information by students. 3.Drawing paintings about air and water for humans, animals and plants.	45 minutes	1. We need to breathe in healthy air. 2. We need clean and healthy water to survive. 3. Humans, animals and plants need a healthy nature to survive.	Laptops, Internet, Mobile phones

Second Session	Our life and the earth orientation	Second Grade (pages 22-29)	1. Referring to the sites introduced by the educators and review the information available on human life and the rotation of the earth. 2. Teaching how to collect information about people's lives and the rotation of the earth from related websites and how to categorize the collected information. 3. Drawing paintings about the content of the lesson on human life and the rotation of the earth.	45 minutes	1. The earth is circular. 2. People need the earth rotation to live. 3. Sunlight causes the plants to grow. 4. The great God causes the rotation of the earth and the flow of human life.	Laptops, Internet, Mobile phones
Third Session	Food	Third Grade (pages 13-18)	1. Providing information about the foods and the importance of examining the foods by the teacher. 2. Teaching the importance of food in our lives. 3. Teaching how to collect information about food from the related websites and how to categorize the collected information 4. Teaching how to prevent materials to be corrupted.	45 minutes	1. The list of foods needed to be consumed by children includes milk, yogurt, honey, white meat, protein substances such as beans and lentils, eggs, breads, dates and other materials. 2. Some ingredients like puffs, chips, and high amounts of sugar and salt are not suitable for the body.	Laptops, Internet, Mobile phones
Fourth Session	Energy, our everyday need	Fourth Grade (pages15-25)	1. Providing general and necessary information on the nature of energy, types of energy. 2. Guiding student for referring to the websites introduced by the educator and examining information on energy, energy types, and the importance of the energy for humans and more. 3. Methods of collecting information on the nature of energy from related websites and the method of categorizing the collected information.	45 minutes	1. All animals need energy to survive. 2. The energy is electric, thermal, acoustic and luminous. 3. Energy comes from a variety of sources, such as water, wind and heat, or by other sources such as power stations. 4. Due to the importance of energy, it should be saved and consumed properly.	Laptops, Internet, Mobile phones
Fifth Session	Electrical energy	Fourth Grade (pages 25-33)	1. Providing complementary and necessary resources for collecting information on how to better understand energy and its benefits to human life for students. 2. Painting Energy Resources by Students	45 minutes	1. Electrical energy can be converted to other energies, such as heat, etc. 2. Electrical energy should be saved in various ways.	Laptops, Internet, Mobile phones

After the implementation of WebQuest training with the help of the Merrill's Instructional design model for the first group of people (children under the training of WebQuest method based on Merrill's Instructional Design model), it was time to use blended learning environment with the help of Merrill's Instructional Design model for teaching children in the second experimental group (children under the training of blended learning environment based on the Merrill's Instructional design model). To this end, and as mentioned above, the first three levels of performances were considered for the Instructional design process, blended learning with the help of the Merrill Instructional Design Model. Functional levels based on the Merrill's Instructional Design model included reminders, applications, discoveries and innovations. In the following, writing the learning objectives related to the blended learning environment was addressed with focus and approval objectives in the Merrill Instructional Design design, which included the precise definition of inclusive behavior, the precise determination of constraints, the determination of the amount or expected level, determination of the setting of the objectives and considering abilities and inclusive knowledge. It should be noted that Instructional design process for learning in the blended learning environment with the help of the Merrill's Instructional Design model, all the principles and rules are set and emphasized in the Merrill's Instructional Design model, and they were all considered in the training program for students of the second experimental group (children under the training of blended learning environment based on the Merrill's Instructional Design model). In the following and after the educational designing, for the teaching of the blended learning environment based on the Merrill's Instructional Design model, which was initially carried out, it was time to teach children aged 6 to 10 years in the second experimental group. Finally, teaching in a blended learning environment with the help of the Merrill's Instructional Design model, in the form of a daily lesson plan, during 5 sessions (45 minutes each session) for 6-10-year-old cancer patients in the second experimental group was conducted (with children under the training of blended learning environment based on the Merrill's Instructional Design model).

Table 2: Description of the Implementation steps for Blended Learning Components based on the Merrill's Instructional Design Model

Level	Stage and activity description
First	1. Collecting the Standard Data on Educational Needs of Children in Mahak Hospital. 2. Considering the title, the audience's performance, their location, their total number, the time frame for doing so, the extent to which the audience is interested in educational content and similar or dissimilar educational activities in the past. 3. Focusing on the purpose of teaching, and answering the question of what findings should the audience exactly know as a result of training. 4. Providing approved objectives, general plan, topics and subsets specified to the audience.
Second	Creating and developing a learning transfer strategy with emphasis on what was done before, during and after education could be used to influence education in their audience.
Third	1. Establishing and developing an evaluation strategy emphasizing the recognition of the effectiveness of education through reviewing learning activities (content and outline of learning activities) 2. Identifying and collecting any evidence for establishing and expanding the course in the future.
Fourth	Organizing all outputs from the desired training process.
Fifth	1. Identifying the elements contained within the content or heads of learning activities for online presentation. 2. Paying attention to the combination of both traditional and modern education 3. Providing effective education by combining online learning with basic face-to-face interactions in the classroom. 4. Presenting a draft plan for learners of the Mahak Hospital

Following the implementation of WebQuest training with the help of the Merrill Instructional Design model (for the first experimental group) and teaching in blended learning method based on the Merrill's Instructional Design model (for the second experimental group), once again, the learning rate of children aged 6 to 10 years at Mahak Hospital was evaluated in both the first and second experimental groups using Ali and McKinsey Learning Measurement Questionnaire (2001). The scores of all individuals in both groups at this stage were considered as post-test scores. Finally, to examine the impact of each of the two methods of WebQuest training and the blended learning environment on learning of the children aged 6 to10 years old in Mahak Hospital, descriptive statistics (mean and standard deviation) and inferential statistics (multivariate covariance analysis and Chi-square test) were used to study the different amount of effectiveness between the two methods.

Findings

The descriptive indicators of the students participating in the research are that from each of the first to fourth grade, 5 students were selected. In addition, the age of students is from 6 to 10 years old, in which students were selected from different equal age groups.

Table 3: The results of Credit Indicators of the Significance Test of Multivariate Covariance Analysis in WebQuest Teaching based on the Merrill's Instructional Design Model

Source of change	Value	F	Hypothesis df	Error df	Sig	Partial Eta Squared
Pillai's trace	0.792	11.83	2	7	0.001	0.642
Lambdai Wilker	0.282	11.83	2	7	0.001	0.642
The Hoteling trace	3.809	6.91	2	7	0.001	0.642
The biggest root on	3.809	6.91	2	7	0.001	0.642

1. To answer the first question with the title that "Does WebQuest training based on Merrill's Instructional Design model has an influence on the learning of children aged 6 to 10 years in the Mahak hospital? " the findings show that according to the results of Table 3, the significance levels of all tests allowed the use of multivariate covariance analysis. These results indicate that there is a significant difference between the pre-test and post-test scores of the trained subjects in WebQuest based on the Merrill's Instructional Design model at least in one of the components of learning.

Table 4: Results of One-Way Variance Analysis in WebQuest Learning Based on Merrill Instructional Design Model

Row	Components	Type III Sum of Squares	DF	Mean Square	F	Sig.	Partial Eta Squared
1	Free conditions and students' motivation for doing their homework	23.79	1	23.79	6.43	0.006	0.456
2	High effort on difficult material	29.54	1	29.54	3.19	0.025	0.219
3	Competitiveness and comparison of performances	0.68	1	0.68	14.50	0.286	0.005

4	Social power and student motivation for supervision and leadership	38.52	1	38.52	11.42	0.009	0.569
5	Coherence and group work in the field of education	0.68	1	0.68	3.76	0.075	0.012
6	Social interest and motivation to help others to progress	25.49	1	25.49	5.90	0.000	0.558
7	Students' motivation to attract and encourage others to study	0.37	1	0.37	7.19	0.342	0.002
8	Students' motivation for appreciation and rewards in education	19.66	1	19.66	7.06	0.025	0.249
9	Total Score	74.39	8	9.29	17.43	0.003	0.718

The results of Table 4 show that there is a significant difference between the pre-test and post-test of WebQuest trained people based on Merrill's Instructional Design model on free conditions and students' motivation in doing homework, high efforts on difficult materials, social power and students' motivations for supervising and leadership, social interests and motivations to help others to progress, and finally, the students' motivation to appreciate and receive rewards in education. This means that WebQuest training based on the Merrill's Instructional Design model has a significant effect on the learning of children aged 6 to 10 years old in the Mahak Hospital.

Table 5: The Results of Credit Indicators of Significance Test of Multivariate Covariance in Training in a Blended Learning Environment Based on the Merrill Instructional Design Model

Source of change	Value	F	Hypothesis df	Error df	Sig	Partial Eta Squared
Pillai's trace	0.549	19.65	2	7	0.004	0.419
Lambdai Wilker	0.549	19.65	2	7	0.004	0.419
The Hoteling trace	2.791	19.65	2	7	0.004	0.419
The biggest root on	2.791	19.65	2	7	0.004	0.419

To answer the second question with the title that "Does training by blended learning environment based on Merrill's Instructional Design model has an influence on the learning of children aged 6 to 10 years in the Mahak hospital؟" the results of Table 5 indicates the significance levels of all tests allow the use of multivariate covariance analysis. These results indicate that there is a significant difference between the pre-test and post-test scores of trained learners in the blended learning environment based on the Merrill's Instructional Design model at least in one of the components of learning.

Table 6: Results of one-way variance analysis in Blended Learning Environment based on Merrill's Instructional Design Model

Row	Components	Type III Sum of Squares	DF	Mean Square	F	Sig.	Partial Eta Squared

1	Free conditions and students' motivation for doing their homework	18.54	1	18.54	11.79	0.013	0.398
2	High efforts on difficult materials	34.76	1	34.76	9.75	0.009	0.739
3	Competitiveness and comparison of performances	23.90	1	23.90	7.31	0.024	0.388
4	Social power and students' motivation for supervision and leadership	17.95	1	17.95	15.59	0.007	0.243
5	Coherence and group work in the field of education	0.79	1	0.79	2.15	0.093	0.003
6	Social interests and motivations to help others to progress	0.54	1	0.54	12.67	0.072	0.011
7	Students' motivations to attract and encourage others to study	0.89	1	0.89	2.59	0.149	0.007
8	Students' motivations for appreciations and rewards in education	37.92	1	37.92	16.58	0.002	0.681
9	Total score	85.61	8	10.71	21.49	0.001	0.495

The results of Table 6 show that there is a significance difference between pre-test and post-test of WebQuest trained students based on Merrill's Instructional Design model on free conditions and student motivation in doing homework, high efforts on difficult materials, competing and comparing their academic performance with the others, social power and students' motivations to supervise and motivate students to appreciate and receive rewards in studying. This means that WebQuest training based on the Merrill's Instructional Design model has a significant effect on the learning of children aged 6 to 10 years old in Mahak Hospital.

Table 7: (Chi-Square Test (X2)), The Study of The Difference Between Learning Components among WebQuest Trained People and the Blended Learning Environment Based on the Merrill's Instructional Design Model

Raw	Components	Training	Mean	X2	Sig
1	Free conditions and students' motivation for doing their homework	WebQuest method	16.49	2.47	0.019
		Blended learning environment method	13.72		
2	High effort on difficult material	WebQuest method	29.15	4.79	0.135

		Blended learning environment method	27.83		
3	Competitiveness and comparison of performances	WebQuest method	15.41	0.94	0.048
		Blended learning environment method	19.61		
4	Social power and students' motivation for supervision and leadership	WebQuest method	25.70	2.32	0.094
		Blended learning environment method	24.79		
5	Coherence and group work in the field of education	WebQuest method	5.22	0.54	0.248
		Blended learning environment method	7.12		
6	Social interest and motivation to help others to progress	WebQuest method	16.94	8.09	0.006
		Blended learning environment method	12.92		
7	Student motivation to attract and encourage others to study	WebQuest method	11.79	1.47	0.059
		Blended learning environment method	12.70		
8	Students' motivation for appreciation and rewards in education	WebQuest method	34.91	5.19	0.243
		Blended learning environment method	33.45		
9	Total score	WebQuest method	155.61	3.67	0.069
		Blended learning environment method	152.60		

To answer the third question, "Is there a difference between the effect of WebQuest training and the combined learning environment based on the Merrill's Instructional Design model on the learning of 6- to 10-year-old children in Mahak Hospital?" Table 7, the chi-square level of (X2) related to the components of a high efforts on difficult materials (4.19), social power and students' motivations for supervision (2.32), coherence and group work in the field of education (0.54), the students' motivations to attract and encourage others to study (1.47), students' motivations for appreciation and rewards in education (5.19) and the total score of learning (3.67) is greater than 0.05. Thus, it can be stated that there is a significant difference between the level of learning of WebQuest trained and blended learning environment trained students based on the Merrill's Instructional Design model in the components of high efforts on difficult materials, social power, and students' motivations for supervising, coherence and group work, students' motivations to attract and encourage others to study, students' motivation to appreciate and receive rewards in education, and total score of learning. However, the chi-square level (X2) related to the components of free conditions and the students' motivation to do homework (2.47), to compete and compare their academic performance with the others (0.94) and social interest and motivation to help others to progress (0.098) at a level smaller than 0/05 is meaningful. Therefore, it can be stated that there is a significant difference between the level of learning of WebQuest trained students and the blended learning environment based on the Merrill's Instructional Design model in terms of free conditions and the students' motivations to do their homework, compete and compare their academic performance with the others, and social interests and motivations to help others to progress.

Findings and Discussions

The rapid progress of society has led the educational system of countries to emancipate themselves from traditional and inactive methods and has turned to modern educational methods in order to adapt themselves to the needs of the community. There are many modern educational methods that are used in terms of delivering educational contents, but the

impact of these methods increases dramatically when they are accompanied with the plans and the curricula. Having modern educational methods from the instructional design makes regular, flexible and active educational content available to learners and increases their willingness and motivation to learn. The great impact of modern educational methods on learning of ordinary students has led scientists and researchers to test these modern methods for students with illnesses and psychological problems in order to examine the effectiveness of these methods on the level of learning of these groups of students. A group of these students with illnesses was cancer students that were being under treatment at Mahak Hospital. These children were under special treatment due to physical and psychological problems caused by cancer and could not go to school and study like other students. Therefore, the use of educational methods that would help these students to continue their studies despite attending a hospital was very helpful and would enhance their self-esteem and life expectancy. It should be noted that any educational method could have a positive effect on the learning process of these students. Therefore, educational methods should be used to educate these children, and will encourage them to learn and study. There are a number of modern educational methods are available each of which can have positive effects in terms of educational contents and learners' characteristics. In this regard, the present study examined the effect of WebQuest teaching methods and blended learning environment based on Merrill's Instructional Design model on the learning of children aged 6 to 10 years old in Mahak Hospital.

The results of this study showed that WebQuest teaching method based on Merrill's Instructional Design model had a positive and significant effect on the learning of children aged 6 to 10 years in Mahak hospital, which improved and facilitated the learning process and its components in children. The results of this study are consistent with the results of the research by Derosa et al. (2010) and Hoffman (2016); The results are consistent with the results of the research by Mcloughlin and Lee (2008) which stated that the Instructional Design process according to the Merrill's Instructional Design model and using the WebQuest teaching method can be used to improve the learning process in students. Using WebQuest teaching to educate children with cancer aged 6 to 10 years old, due to their distance from their schools, increased their participation; in other words, using WebQuest to educate children with cancer would activate and increase their learning motivation. The nature of WebQuest teaching is based on the constructivist approach where the cancer children through constructive activities would learn their practical abilities and their motivation as well as their passions for learning increases. In addition, the use of WebQuest reduced the anxiety of these children; anxiety that might have been caused by their distance from schools and lack of learning activities. Using computers and other virtual learning resources such as WebQuest could encourage learners to learn, believe in their abilities, and ultimately improve their learning process. In long term, this could even increase the confidence of these children to fight their illnesses.

WebQuest includes learning principles and cognitive activities such as participatory learning, learning scaffolds, problem solving, sharp learning and thinking, objective assessment, social and cognitive learning, active learning and increased motivation for learning more effectively. These are the necessary elements for children`s learning such as children hospitalized at Mahak Hospital who have various problems in their learning for many reasons. In WebQuest teaching, learning and retention of thinking skills in high levels are promoted that include content thinking, critical thinking, and creative thinking skills. By providing a structure and guidance for educators and learners, WebQuest helps children to focus on resources provided by educators instead of focusing on searching for resources.

Moreover, the results of this study showed that teaching in blended learning environment method based on Merrill's Instructional Design model had a positive and significant effect on the learning of children aged 6 to 10 years in Mahak Hospital, which improved and facilitated the learning process and its components in children. The results of this study is consistent with the results of studies by Ham and Rena (2010) and Derosa et al. (2010). It is also consistent with the results of Chieh Ya San and Rood's (2012) which indicate the desirability of using the Merrill's constructivism model in educational environments. Blended learning environment for teaching cancer children aged 6 to 10 years old enriches learning plans, facilitates more efficient transfer of learning materials, saves money and improves cancer children's education program at Mahak Hospital and allows children to progress on their own and away from school.

In addition, learning in a blended learning environment increases the level of learning due to quick feedback to children. The ease of applying educational materials by these children and, most importantly, the very low cost of accessing the rare information needed for further education and helping children with cancer to be used by parents and hospital officials. The most vital issue in blended learning is that it provides a redesigning of teaching and learning transfer structure with the aim of rebuilding class contacts, improving class participation, and providing broad access to web-based learning opportunities. Moreover, redesigning educational opportunities can them to be more independent and confident. In addition, they can take part in classes and increase their social skills.

Finally, the results of this study showed that there was a significant difference between the amount of learning of cancer children with WebQuest teaching method and blended learning environment in the components of the high efforts on difficult materials, social power and students' motivations for supervising, coherence and group work in the field of education, the students' motivation to attract and encourage others to study, the students' motivation to appreciate and receive rewards in education and the total score of learning. However, there was a significant difference between the level of learning of children with cancer by WebQuest teaching and blended learning environment in the context of free conditions and students' motivation in doing homework, competing and comparing their academic performances with others and social interests and motivations to help others to progress. In this way, WebQuest teaching method had a greater impact than blended learning environment on the components of free learning environment and students` motivation in teaching and social interest, and motivation to help others to progress. The effect of training on the blended learning environment was more than that of WebQuest method on the competitiveness component and performances comparison.

This study, like any other researches, had encountered constraints such as the use of a research tool (questionnaire), limited statistical society, and so forth. Therefore, the use of other research tools such as observation, interviewing, and others are recommended to expand the statistical community to larger environments. According to the findings of this study, it is suggested that more applications of these methods be taken into consideration in improving the process of learning and teaching of children in Mahak Hospital. In addition, in-service training courses will be held for all mentors and teachers working at Mahak Hospital. It is hopeful that in these courses, these staff members will become familiar with more effective approaches to better education for children at Mahak Hospital. It is also suggested that teachers' and mentors' training courses in university centers and Frhangian university, the applications and approaches to implement teaching models in a blended learning environment as well as WebQuest training based on Merrill's Instructional Design model, more often in books, lessons and student training courses should be taken into consideration. In the end, our suggestion to researchers is that in future studies, the effectiveness of learning in a blended learning environment and WebQuest training based on Merrill's Instructional design model, can be taken into consideration on the learning of other children and other statistical populations. It is also worth considering and comparing the effectiveness of various Instructional Design models on the learning of cancer children.

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