

Reviewing Educational Children's Books in Terms of Graphic Design in the Context of Multimedia

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Abstract

New communication technologies diversifies the teaching materials which are used in the education process. The development of different tools in the process of achieving learning skills is a result of technological progress which is developing rapidly. Using the new media and multimedia applications in the education process forms the starting point of this paper. The purpose of this study covers the examination of the multimedia applications during e-learning process in the context of design principles and evaluation of them in term of visual design. It is a fact that educational materials which are designed visually saturated and qualified affect perception and comprehension skills of the students. Samples of educational children's books in multimedia applications based on multimedia design principles which are developed in this respect are evaluated and features of qualified materials are mentioned. Face to face communication system which is required by the traditional education system is turning new communication system into supported materials, thus intelligence, skills, learning abilities of the students are changing multidimensional. So much so that, learning materials in question is capable of addressing more than one senses of a person. In the scope of this study, in terms of providing a person with an effective learning process, the designs of the teaching materials used by the technology are considered visually, both illustrations and design elements and features are examined in terms of graphic design and the research is completed through the necessity of designing a qualified teaching material.

Keywords: multimedia design, learning materials, multimedia design principles, educational children's books, e-book, e-learning, graphic design.

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1. Introduction

Individuals' learning new behaviours under the influence of environmental factors and developing individual-oriented behaviour change define the learning process. Fer defines learning as the individual's learning of new behaviours gradually under the influence of stimulants in a selected and controlled environment and the change in the existing behaviours (Fer, 2011). In fact, learning involves a process which varies from person to person shaped according to individual differences. Taking place of learning, consciously or unconsciously, and its existence around every moment of life in terms of facilitating a person's keeping pace with the environment can be defined as the indicators of the continuity of the learning. Teaching, then, can be stated as "all of the application processes for providing people with terminal features." Processes of learning and teaching are in the mentioned teaching process (Guleryuz, 1998). Guleryuz specifies the elements which form the teaching process as students (learning), teachers (teaching), aim, method, content, assessment, environment and time and tools to which features stipulated by the programme. The elements of teaching process; teacher, learner and the one who is taught, can be possible by the interaction of these mentioned elements. And educational technology presents the shape of transmission of knowledge to the individuals in the aforementioned teaching process. Transmission can be carried out with the *communication* concept which characterises the transfer process of information, thoughts, feelings and suggestions to the other side -people-. With the idea of carrying out effective learning and forming the environment, communication can be expressed as one of the most important pieces of learning process. An individual's having a learning experience can be diversified with new communication environment and equipment. Today, these environments and tools are developing and having added striking features, they turn into products which contribute to learning. The concept of *instructional design* is a knowledge discipline which is developed for enhancing the quality of teaching process and which is using the teaching concept (Fer, 2011). In the learning process, finding and using the most appropriate and the best way is necessary for the learners to learn effectively. In this context, the aim of the learning methods and the educational materials which are developed are to carry out a productive learning experience.

2. Teaching Methods: E-learning

Education and teaching processes and concepts are expanding in parallel with the developments in technology, *e-learning* (electronic learning) concept enters into information and communication technology. Differentiation of communication from past to today and the spread of the Internet usage make the information to be transmitted electronically. *E-learning* which can be defined as "performing teaching activities in electronic environments or transferring the information and skills via electronic technologies" and "carrying out the teaching activities in electronic learning environments by providing the access to information regardless of time and space with the help of information and communication technologies and through local or wide area networks such as the Internet/Intranet, and by providing interaction via multimedia applications" (Gulbahar, 2012) makes it easier for the individuals to reach at the information without any place and time limit. In this context, electronic book sample assessments, which are one of the teaching materials of the new communication technologies and multimedia design product, are provided within the framework of this paper. In the scope of information and new communication technologies, the technologies which are used in the process of e-learning can be considered as computers, the internet, television and broadcasting tools which carry out the transmission of sound and vision. Distance learning concept is also considered to be in the process of e-learning and in Turkey, distance learning and e-learning applications are supported by universities and by the open universities (faculty, high school or elementary school of open universities). The researches in which the reflections of the teaching methods on student success, the learning methods in electronic environment and traditional environment are compared show that in both ways there isn't any difference between the students who obtain the experience of learning. So that, the familiarity of the students with the technology, individual characteristics,

interaction, effectiveness, educational technologies (technology integration in education) are stakeholders which effect the efficiency of the learning process. Transferring of the new technologies to the educational environment diversifies the teaching materials. E-books, e-magazines, e-newspapers, e-newsletters and e-guides are used as e-learning technologies in question.

Due to the easy usage and access, online communication technology products; e-publications have been among the teaching materials which are widely used in education. In this paper, children's books are discussed in terms of the features of the application and multimedia designs.

3. Multimedia and Design

Multimedia can be defined as an application environment appealing both visual and auditory senses at the same time which is formed by "gathering the text, graphics, sounds, animation and video contents in computer environment..." (Gulbahar, 2012) Multimedia which also means the presentation of a message in multiple media, is the presentation of an information as a combination of words and images according to Mayer's definition (2007). The concepts of verbal and visual channels in learning indicate that the information which is presented verbally is processed via verbal channel and the information which is presented visually is processed via visual channel in the mind. Cognitive Theory of Multimedia Learning which is developed by Mayer (2007) says that learning will be more effective if the information comes from two channels instead of one (Perkmen, 2011). According to Cognitive Theory of Multimedia Learning developed by Richard Mayer, audial elements are processed into the working mind through ears and visual elements are processed through eyes. This situation indicated that, words are stored as sounds and images are stored as visual models. Later on, the information in which these two elements are integrated is associated with the previous information and they are stored into the long-time memory (Perkmen, 2011). With Perkmen's expression, multimedia design consists of five stages. These stages are choosing appropriate words, choosing appropriate images, editing the selected words, editing the selected images and combining the words and images significantly (Perkmen, 2011). The Cognitive Theory of Multimedia Learning which is asserted by Mayer is based on the Multimedia Design Principles. Aforesaid design principles are proposed as principles which must exist in order to provide an individual with a learning experience.

The Multimedia Design Principles supporting the learning process; (1) Multimedia Principle, (2) Spatial Contiguity Principle, (3) Temporal Contiguity Principle, (4) Coherence Principle, (5) Modality Principle, (6) Redundancy Principle, (7) Individual Differences Principle, (8) Segmentation Principle, (9) Personalization Principle, (10) Signalling Principle are accepted as principles which must be taken into consideration for multimedia design products with the aim of demonstrating how to have a better learning process for learners via multimedia materials.

To give you a brief to these principles,

(1) *Multimedia Principle* which contains the idea that the learners can learn much better with designs (environments) visual elements and words are used altogether rather than the designs formed only by words,

(2) *Spatial Contiguity Principle* which proposes a better learning by placing the words and visual images which are semantically related close to each other,

(3) *Temporal Contiguity Principle* which proposes a better learning in an environment where semantically related words and visual images are transmitted *at the same time*,

(4) *Coherence Principle* which contains that the elements which aren't related to the topic mustn't be used in the design,

(5) *Modality Principle* which proposes a better learning with a design consisting of animation and dubbed words rather than a design consisting of an animation and a text (Mayer, 2007), (Perkmen, 2011),

(6) *Redundancy Principle* which proposes a better learning in the situations when only visual images and verbal expressions are used together rather than the designs in which visual element, verbal expression and words are used together,

(7) *Individual Differences Principle* which proposes that the multimedia design is more efficient for the people who have prior knowledge of the subjects taught rather than for the ones who have little knowledge,

(8) *Segmentation Principle* which proposes a better learning by dividing the subjects into segments within themselves rather than presenting subjects continuously without dividing,

(9) *Personalization Principle* which proposes a better learning in the situations when information is transferred with everyday language rather than an academic lecture,

(10) *Signalling Principle* which proposes a better learning by emphasising on important words and visual elements at the design (Mayer, 2001 & 2007), (Clark, & Mayer, 2003) (Kuzu, 2014) and which proposes a better learning by having descriptive information, signs, guiding and attention gathering information at the teaching materials for the learners are the titles from multimedia products which are discussed on electronic book-scale.

In particular, designing the teaching materials by taking the contributions of teaching materials on learning and on people's learning sensory organs into consideration makes the multimedia design necessary. The researches which are made on the functions of the sensory organs and their effects on learning shows that we learn 83% of the information by seeing, 11% by hearing, 1,5% by smelling, 1,5% by touching and 1% by tasting. (Tezci, 2011). The rates for recalling what is learned vary according to the effects of senses on learning. The researches which are made on this topic by Mayer and various other pedagogues shows that among the information which is learned by using the five senses, individuals remembers 10% of what they read, 20% of what they heard, %30 of what they heard, %50 of what they both saw and heard, %70 of what they said, 90% of what they both said and done (Fer, 2011). In this respect, teaching materials which appeal to multiple senses and which are designed considering these percentages support the idea that they will provide a person with effective learning.

3.1 Reviewing Educational Children's Books Applications in Terms of Graphic Design and Multimedia Principles

In the book design which is a graphic product, suitability of the content to target audience, the integrity of the design and the content, consistency of the content with the method, its appropriateness to the learning environment, and compliance of the target audience with learning level are necessary details that must be kept in mind. The most important points which must be considered are whether the visual elements are highlighting the essential points, whether the design is simple and understandable and whether the product is developable and updatable (Fer, 2011).

In this part, some examples on interactive electronic children's books are examined. The children's book which is called "*Who Stole the Moon?*" is an interactive book which is examined by considering the Multimedia Design Principles. For example, see Fig. 1. "*Who Stole the Moon?*" which is written by Helen Stratton Would and illustrated by Vlad Gerasimov is a book which is both published in print and broadcasted in electronic media. This publication which is an interactive electronic book focuses on the story of a boy named Berk (Bertie). Berk is a kid who admires the Moon, falls asleep while watching her and has beautiful dreams about her. He has the dream of being an astronaut when he grows up. One day, Berk, who watches the Moon every night, cannot find the Moon in the sky and he feels a great sadness. He thinks that the Moon is stolen by some people and he starts looking for her. The book is designed aiming at children aged 4-8. "*Who Stole the Moon?*" is an e-book which is developed by an international digital publishing company called *Windy Press* based in Chicago. The book "*Who Stole the Moon?*" which is written by the author for her 2 years old son was developed by

a large working team and the story of Berk's (Bertie) looking for the moon is told as a bedtime tale to improve the imagination of the children. If you need to examine the book *who stole the Moon?* within the framework of Mayer's Multimedia Design Principles, we can say that there are visual descriptions in page designs (in storytelling) instead of using only the words and this, matches up with the *Multimedia Design Principle* which proposes that learners can learn the messages better with both visual elements and words. According to *the Spatial Contiguity Principle*, which includes that the visual description and words about the topic must be placed close to each other, the visual elements and words are placed meaningfully in the e-book. The illustrations in the book are placed by being removed from the details by taking the age range into consideration and a simple, plain and understandable language is used.



Fig. 1. Screenshots from the children's book Who Stole the Moon?

Modality Principle (Mayer, 2007), which proposes that better learning can be achieved with a design formed by animation and verbal lecture rather than animation and text, is a principle taken into consideration in the e-book called *Who Stole the Moon?* Visual elements are facilitated movement associated with their meanings and verbal lectures are made related to the visual element. *Redundancy Principle*, one of the Multimedia Design Principles, proposes a better learning in the situations when only visual images and verbal expressions are used together rather than the designs in which visual element, verbal expression and words are used together. In the aforementioned book, especially this feature is paid attention in order to prevent the readers from distraction and to reduce intense expressions at the design. By not using the elements which aren't relevant to the topic in the design, *Coherence Principle* is complied. The illustrations, dubbing and text taking place at the design are transmitted to the reader at the same time, visual element takes place at the background with a reduced degree of visibility, and dubbing and text is activated. After completion of the text and verbal explanation, visual elements are becoming visible. The guiding signs and informative buttons at the teaching material are in parallel functionality with *Signalling Principle*.

Another book is a children's book called *Goodnight Safari*. Interactive e-book published by Polk Street Press is a fun and educational book application for 4-year-olds which they can read before going to bed. *Goodnight Safari* which uses a child's helping animals with a teaching with game method is a fun and interacted e-book and it includes educational games such as counting, word completion, creating the whole by combining parts etc. For example, see Fig. 2. Having games supporting learning, the book helps children experience a fun learning. In this context, this book including a multimedia application is designed by paying regard to Mayer's principles which carries the aim of focusing in the content to be learned and the aim of teaching materials to support the effective learning process is applied in terms of visual design. It becomes clear with simple and plain illustration language and

simple page design preferred as a design and illustration language according to the target age range. Text placements are made within the framework of visual design integrity in relation to the illustration and it is observed that the elements that may cause distraction aren't included. Based on this, aforementioned e-book can be said to be a qualified educational electronic book application.



Fig. 2. Screenshots from the children's book Goodnight Safari.

4. Result

Graphic design/visual design at e-books which are among multimedia applications can be considered as a tool that allows the users to interact with the book. The nature of the interaction is related to suitability of the content, target audience and illustration with the design. An efficient learning process experience for a learner can be performed by a qualified teaching material. In this respect, as well as the book content, the visual design of the book is important. In the context of Multimedia Design Principles, positioning of the designing elements by taking their contribution levels in learning into consideration is within the scope of this paper. The design principles affecting the visual design quality of e-books, which are among the teaching materials having educational features, are details which affect this process. It can be seen that, mostly computer and instructional technology department researchers are studying on this topic and it is necessary for the designers who are making the visual design of the multimedia applications to be familiar with the idea. Also in order to design qualified products it is important for them to use *Multimedia Design Principles* in their designs in addition to the design principles they have to be careful of. Learning with fun by game is one of the methods used in educational books. While reading a children's book, it is possible to both get information and spend a pleasant time. For this reason, in term of its attractiveness and user dynamism (effectiveness), interactive educational electronic book applications turn into a qualified product fit for purpose when they are created in a rich (saturated) e-learning process. When the importance of the books in terms of child development is taken into consideration, both with its content and with its format, e-books have been preferable in multimedia. The effects of stylistic quality of the design to learning and functionality of the product are examined in the scope of this paper. With this paper in which the arrangement of visual elements and text elements is proposed to be carried out within the framework of universal design principles, the importance of the graphic design in educational e-book applications is emphasized and it is also proposed to carry out designs within the framework of aforementioned principles.

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