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Evaluation of information and communication technology textbooks according to principles of visual design

Gulcan Numanoglu[a]*, Safak Bayir[a]

[a] Educational Sciences Faculty, Ankara University, Cebeci Campus, Ankara 06590, Turkey

Abstract

The aim of this research is to evaluate ICT (Information and Communication Technologies) textbooks of primary education 2nd level, 6th and 7th grades in Turkish Republic of Northern Cyprus (TRNC) according to 48 predetermined visual design principles. The suitability of the textbooks within the scope of this research was evaluated in terms of design principles by using a three-item likert scale. It was observed that none of the books were prepared by considering the visual design principles as a whole.

Keywords: Information and Communication technologies textbooks; visual design principles; evaluation.

1. Instruction

Textbooks are necessary resources for teachers in learning environments. Textbooks are the most commonly used tools which are based on curriculums, prepared in the way that they will enable the students to access to the information by themselves in accordance with the predetermined attainments, with their sequentially and accurately prepared content, presenting the information in a constructed way (Duman et al., 2001; Demirel et al., 2001, 77; Bayrakçı, 2005; Selvi, 2008, 101). Being available at any time for use both in and outside the classroom, textbooks are the most frequently referred tools (Seferoğlu, 2006, 60). According to Alkan (1992), textbooks which are used in learning-teaching process have particular importance as a fundamental tool. According to Yalın (1996), teacher determines the aims of the lesson, tests to be used, teaching strategies and tasks in accordance with the textbooks which give ideas to teacher about the activities that can be used during teaching learning process in classroom. Recent research results emphasize that the textbooks should be prepared in the way that they can ensure students learn more meaningfully. Therefore, there is a need to evaluate and update the textbooks. The evaluation of the textbooks is carried out within two aspects; content analysis and conformity to visual design principles.

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* Gulcan Numanoglu. Tel.: +90-312-363-3350 (3211); fax: +90-312-363-6145.
E-mail address: numan@education.ankara.edu.tr.

Some of the researches related to the evaluation of the textbooks are: Yalın (1996), primary education 7th grade national geography textbook according to schema theory; Erdoğan (1999), 286 books for children published between 1996-1998 according to 25 criteria; Şahin (2001), evaluation of high school 1st grade mathematics textbook according to opinions of teachers and students; Keleş (2001), physics textbooks by interviewing physics teachers; Kabapınar (2001), Turkish and English science textbooks according to visual elements; Semerci ve Semerci (2004), primary education 1st-5th grades, mathematics textbooks according to the opinions of class teachers, Keser (2004), primary education 4th grade and Eşgi (2005), 5th grade computer textbooks according to visual design principles; Sözer, Karaduman and Özdemir (2007), primary education 4th-5th grades, social studies textbooks and workbooks according to the principles of constructivist learning; Kuzu and Yıldırım (2008), information and communication technologies student guidelines and workbooks according to the opinions of the teachers and Taş (2008), primary education 4th-5th grades social studies textbooks according to the opinions of class teachers. In these researches, the textbooks were evaluated according to theories, visual design principles or opinions of teachers/students and some inadequacies were observed. In a contemporary learning-teaching environment, teachers with the qualifications that they should have are designers, planners, implementers and evaluators of teaching process (Selvi, 2008, 39). Textbooks should be prepared in accordance with the visual design principles and teachers should check the textbooks whether they were prepared according to these principles before they select the textbooks. Within this context, information and communication technology teachers need to be equipped with the information on how to evaluate the information and communication technologies textbooks in order to be able to employ their private domain competencies related to programme and content information. This research aims to evaluate 2nd level primary education 6th and 7th grades ICT (Information and Communication Technologies) textbooks in Turkish Republic of Northern Cyprus (TRNC) according to visual design principles.

2. Methodology

This research is limited to 2 different ICT textbooks prepared for 2nd level primary education 6th and 7th grades in TRNC and expert opinions. Textbooks were evaluated by two researchers using a 3-item likert scale (yes, partially, no) according to visual design principles developed by Alpan (2004). The evaluation was grounded on visual design principles which consist of 5 dimensions and 48 items.

3. Findings and Comments

The findings of the evaluation are presented under each subheading below:

A. Text Design (Typographic Properties, Text Organizers)

a) Typographic Properties: 1. According to *the suitability of the sizes of letters to the level of students*, ICT textbooks that were prepared for 6th and 7th grades were found suitable.

2. While the legibility of typeface of 7th grade textbook is suitable, 6th grade textbook is partially suitable to the principle of *legibility of typeface.*

3. According to *the effective use of text colour or tone value* principle, both textbooks were found partially suitable.

4. According to *equal use of vertical or horizontal interlinear space* principle both textbooks were found suitable.

5. According to the *effective design of attention grabbing word or words* principle, neither of the books was found suitable. Words which have negative meaning and some headings are underlined and attention grabbing words were not written in italics or bold.

6. *Linelenghts* in both textbooks were found suitable.

7. *The space between the words* was found suitable.

8. *The space between the letters* in 6th grade textbooks were partially balanced whereas in 7th grade not.

9. *The integrity of the texts* in both textbooks was suitable.

b) Text Organizers: 10. According to *the effective organization of headings* principle, the letters of the headings in 6th grade textbook were written in boxes, but since all the subheadings were not underlined, they were not found suitable. Similarly, since some of the headings were underlined in 7th grade textbook, it was found partially suitable.

11. Both of the books were found partially suitable according to the principle of *functional organization of the table of contents.*

12. Because pictures, charts, graphics which serve for introductory purposes were not used when necessary according to the principle of *organization of the table of contents arrestingly*, both books were not found suitable.

13. According to the principle of *use of boxes to serve purpose*, the boxes in 6th grade textbks were used decoratively in headings and texts. Whereas boxes were not used in the headings, they were used unnecessarily in the texts in 7th grade textbooks. Therefore both books were not found suitable for this principle.

14. Both books were found suitable for the principle of *preparation of list of headings to related chapters.*

15. Because there were not a dictionary for unknown words and technical terms at the end of the books, both textbooks were not found suitable for the principle of *organization of a dictionary*.

16. Both books were not found suitable according to the principle of *organization of the bibliography*.

B. Design of Visual Elements

17. Both books were found partially suitable for the principle of *contribution of visual elements to the transfer of the message.* The name, location and size of the shapes in 6th grade textbooks were not found consistent. Some of the shapes have names while others do not. Sizes of some of the shapes are not big enough for the details to be clearly understood and the proximity level of the text and visual is not consistent.

18. According to the principle of *visual elements should be stimulating in the transfer of the message for students,* visual elements such as pictures, charts, photographs and so on should be designed to stimulate student's imagination, creat excitement. Books were not found suitable for this principle.

19. Books were found partially suitable for the principle of *the patterns should be firm in pictures.*

20. According to the principle of *plainness and simplicity,* the forms of pictures, photograph and so on should be neither fully realistic nor abstract but comprehensible and include details that the message calls for. Books are not found suitable according to this principle.

21. Books are in line with the principle of *use of emphasis in visual elements effectively.*

22. Both 6th and 7th grades books are in line with the principle of *visual elements should be suitable for the level of the students.*

23. Both books are in line with the principle of *visual elements should be colourful.*

24. Because the screen shots are available in both books, they are found suitable for *the principle of integrity in design.*

25. 6th and 7th grades books were found partially suitable for *the principle of use of lines in accordance with the purpose.* Although lines were used in the books, there is ambiguity in the directions of the arrows.

26. 6th and 7th grades books were found partially suitable for the *principle of balance in design.*

27. Books were found partially suitable for the principle of *use of the colours according to the aim.*

28. According to the principle of *use of the sizes of visual elements in accord with the aim*, 6th grade book was found partially suitable because the size of some visuals was bigger and some were smaller than they should be. However, 7th grade book was found suitable for this principle.

C. Page Design

29. According to the principle of *providing certain integrity and visual continuity,* books are found partially suitable. The location of the page numbers and headings are not consistent. And also, in some pages text margins are exceeded.

30. Both 6th and 7th grades books were found suitable for the principle of *visual elements should not hinder flow during reading.*

31. According to the principle of *allowing for visual elements adequately*, both books are in accord.

32. Both books are in accord with the principle of *providing activity in location of visual elements.*

33. Both books are in accord with the principle of *visual elements should be placed close to the related text.*

34. Both books are found partially suitable for the principle of *use of spaces effectively.* It was observed that there were not many spaces and there were unnecessary visuals in spaces in books.

35. Books were found partially suitable for the principle of *organization of the two pages correspondingly.*

36. Although the page numbers were designed as separate design elements, their locations are inconsistent and in some pages they are located on visuals. They are partially in accord with the principle of *organization of page numbers as separate design elements.*

D. Cover Design

37. According to the principle of *covers should be designed in accord with the content and page layout*, the books were not consistent.

38. According to the principle of *text on the bookback should be written from top to bottom*, the text on the bookback slipped to the front cover and there is no text on the bookback of the 7th grade textbook, thus both books being not suitable for the principle.

39. Books were found partially suitable for the principle of *paying attention to the information on the cover.* Though the necessary information was given written on the inner cover, ıt was not given on the cover and bookback.

40. Both books were found suitable for the principle related to the *selection of typeface.*

41. Books were found partially suitable for the principle of *designing the front and back covers as a whole.*

42. Books were not found suitable for the principle of *designing the cover alluringly and aesthetically.*

E. External Properties Directed to Production

43. According to the principle that the *sizes of the books should be A4 for primary education, 1st level, 1st, 2nd and 3th grades and for other levels they should be A5 and B5*, books were not found in accord.

44. Books were not found suitable for the principle of *covers should be firm and durable.*

45. Books were not found suitable for the principle related to the *quality and use of paper.*

46. According to the principle that *the hardcover of the books should be durable and firm,* books were not found suitable.

47. Books were not found suitable for the principle of *printing should be made clear and smooth.* Some images on the pages can be seen on the reverse side making it difficult to read.

48. Books are in line with the principle to *paying attention to the texture-direction of the paper.*

4. Results

The results based on the findings related to the suitability of ICT textbooks in TRNC according to 48 visual design principles are given below.

1. According to the visual design principles of ICT textbooks in TRNC;

• From the point of typographic properties of text design (9 principles); 6th and 7th grades textbooks were prepared in accord with 4 and 6 principles respectively. From the point of text organizers (7 principles) 6th and 7th grades textbooks were in accord with 1 principle.

• From the point of design of visual elements (12 principles); 6th and 7th grades textbooks were prepared in accord with 4 and 5 principles respectively.

• According to page design (8 principles); both 6th. and 7th. grade textbooks were prepared in accord with 4 principles.

• According to cover design (6 principles); both books were prepared in accord with 1 principle.

• According to external properties directed to production (6 principles); both books were prepared in accord with 1 principle.

2. In this research it was observed that ICT textbooks of 6th and 7th grades in TRNC were not prepared by considering all the visual design principles. 15 principles in 6th grade and 18 visual dsign principles in 7th grade were observed.

3. Among the visual design principles 15 of them were considered in both books. They are; the suitability of the sizes of letters to the level of students, line length, equal use of the spaces between the words, the integrity of the

texts on pages, preparation of list of headings for each related chapter, use of emphasis in visual elements effectively, visual elements should be suitable for the level of the students, visual elements should be colourful, integrity in design, visual elements should not hinder the flow during reading, allowing for visual elements adequately, providing activity in location of visual elements, visual elements should be placed close to the related texts, careful selection of typeface, texture-direction of the paper.

5. Suggestions

1. Current ICT textbooks used at this level in TRNC should be revised according to the principles of visual design.
2. Experts from Ministry of National Education and Culture, Department of Education and Morality should consider visual design principles to take in point decisions about textbooks.
3. More researches to evaluate the textbooks for other grades according to visual design principles must be done.
4. Experts such as domain experts, educational technologists, graphics designers should be employed in the process of textbook preparation and they should contribute actively.

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