Determination of Visual Literacy of Preservice Teachers

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ABSTRACT

The aim of this study is to develop a standard scale which will determine visual literacy levels of preservice teachers according to their perceptions. A survey study research methodology was used and a scale was conducted with 216 senior preservice teachers selected in Education Faculty in 2010-2011 spring semester. Principal component analysis was used to construct validity of the scale. The scale consisted of 25 items and Cronbach's Alpha was calculated as .82. The developed scale loaded on five factors and these factors accounted for 54,88% of total variance. Data gathered were presented in tables. The averages of the answers given by preservice teachers in response to the questions relating visual learning proficiencies being high indicate that most of the preservice teachers have high levels of visual learning and literacy. Preservice teachers prefer newspapers most among the written communication means, followed by computer and television. Homework and research purposes were among the first two reasons for using the computer.

Key Words: Visual Literacy; Preservice Teacher; Teacher Education; Scale Development.

INTRODUCTION

In addition to the increase in the use of technological means in educational terms, research studies related to the efficiency of new methods and techniques to increase productivity and also the quest for new models to be applied are being conducted intensively This tendency led to essential changes in terms of educational programmes. "… Equipments and materials are developed in each educational field in order to make students acquire information and behaviour. The things which can be explained with a thousand words can be conveyed through lines and pictures and by showing behaviours that are wanted to be acquired. A picture, a line and a sign may symbolize thousands of words" (Baytekin, 2004, p.5). Freud and Piaget claim that children can perceive concrete images better instead of abstract words at this point (Burmark, 2002).

Our age confronts people with the intense effect of visuals in their milieu from advertisements in their streets to television, on the Internet and almost at everything as if proving Freud and Piaget right. In order to be successful with this intense effect, individuals need a visual literacy education appropriate to the requirements of the age. The concept of visual literacy, which was present for a long period of time in world literature, is a rather new concept for our country.

A number of researchers came up with definitions of visual literacy, which is of importance in educational terms; namely, Wileman (1993) defines visual literacy as the ability of reading, interpreting and comprehending the information presented via pictorial or graphical imagery (Stokes, 2002; Çam, 2006). As for Yenawine (1997), the visual literacy is a kind of ability to find the meaning in imagery. Sinatra (1986) sees visual literacy as the efficient reconstruction of incoming visual messages with past visual experiences in order to have a meaning. Branton (1999) states that visual literacy is a language "consisting the images which are used in conveying the messages that should be deciphered in order to use, interpret and make sense of the images". As it can be inferred from the definitions of researchers, visual literacy has a wide range of topics with many expansions. On the other hand, many definitions were developed relating this topic, it is difficult to find a definition on which experts reached a consensus, though. Nevertheless, when the literature as to visual literacy is examined, the opinion that this kind of communication is a "language" different and independent from the oral expression. Besides, most of the definitions relating visual literacy include how to interpret a visual image. That visual literacy is a language with its own principles and operations reflects the common opinion on which most of the definitions and researches settled. Therefore, when we accept the visual literacy as a separate language, the topics such as reading or seeing the images as the language of the message (visual learning), being aware of visual messages (visual discrimination), learning and teaching how to use it for communication (body language) and the limitations during the application become the current issues.

According to Robertson (2007), visual learning, which is one of the dimensions of visual literacy, is an output of visual thinking. Educators are using visual learning for years in order to teach reading. Graphic editors, pictures, videos and computers can be help to the education of many disciplines. Max Wertheimer, from the school of Gestalt, explains one of the methods of learning inner structure of information in his book named "Productive Thinking" as the creation of visual learning environments. This creation may be made either by the learner or the teacher. The purpose is to clarify thoughts, empower the comprehension, make connections with new information, correct the miscomprehended concepts, and speed the reminding process and to make students create information thanks to a pattern supporting constructive thinking (Yalın, 2004).

Perception of the objects affects learning, creation of concepts, problem solving and critical thinking. Therefore, visual designers should take the perception principles into consideration (Kırkkılıç & Akyol, 2007). Visual perception is related with visual discrimination which is another dimension of visual literacy. According to Keskinkılıç and Keskinkılıç (2005), visual discrimination is the ability to recognize the similarities and differences such as size, colour and shape. Barth and Demirtaş (1997) made a classification given as below relating visual discrimination and what we learnt and remembered: We remember;

10% of what we heard,	40% percent of what we discussed,
15% of what we saw,	80% of our participation control and
20% of what we heard and saw,	90% of what we taught to others.

Although inadequate environment and technology are encountered as the main obstacles owing to the fact that visual literacy is a rather new concept in our country, it is also another fact which draws attention that there are not so many researches relating this matter in the literature of our country. In the study of Kuvvetli (2007), with which she searched the effect of visual reading on the achievement of secondary school students in terms of physics course, it was concluded that the method based on visual reading is more successful than the conventional method. As for Kıran (2008), she evaluated the visual literacy levels of preservice teachers according to their perceptions in their study. At the end of the study, it was revealed that preservice teachers agreed "always" to most of the items relating visual learning by recommending the suggestion that differences between preservice teachers in terms of their departments and the grades can be minimized. Besides, it was also concluded that preservice teachers agreed "usually" to the items relating visual discrimination, visual language and colour tips.

As it can be understood from the literature, the number of research studies concerning visual literacy is inadequate, which draws attention. Also, the fact that there are no standard scales that can be used for the determination of visual literacy levels of preservice teachers' among the studies conducted catches attention. It is obvious that a standardized scale whose reliability calculations are made is required for our literature in order to reveal visual literacy levels of pr-eservice teachers. Determination of visual literacy in addition to visual learning levels, visual discrimination levels, visual language levels of preservice teachers and the limitations pertaining to visual learning via a research will provide detailed information to individuals who will conduct research on this matter.

The main purpose of this study is to develop an eventual scale which will determine visual literacy levels of preservice teachers according to their perceptions.

METHODOLOGY

a) Research Design and Sample

A survey study research methodology was used in this study. The study was conducted with 216 senior preservice teachers selected from the different teacher training departments in Education Faculty in 2010-2011 spring training semester by using aimed selection method. The sample consisted of 134 girls and 82 boys. Mean age of subjects is 22 years. Subjects' descriptive statistics is presented in Table 1.

Table 1. *Subjects' descriptive statistics*

	Properties	f	%
Gender	Girl	134	62,0
	Boy	82	38,0
	Total	216	100
Departments	Primary education	60	27,8
	Science and technology education	39	18,1
	Mathematical education	28	13,0
	Social science education	40	18,5
	Computer and instructional technology education	25	11,6
	Art education	24	11,1
	Total	216	100

Table 1. *Continue...*

	20	16	7,4
	21	34	15,7
	22	78	36,1
Age	23	45	20,8
	24	15	6,9
	25	8	3,7
	Other (20<age<25)	20	9,3
	Total	216	100

62% of preservice teachers are girls and 38% of them are boys. Percentages of the preservice teachers concerning department are 27,8% primary education, 18,1% for science and technology education, 13% for mathematical education, 18,5% for social science education, 11,6% for computer and instructional technology education, and 11,1% for art education.

b) Data Collection Tool and Analysis

A scale consisting of two sections developed by researchers was used to gather data in this study. The first section with open-ended questions was used to assess demographic information of subjects such as gender, age, the last education level, and some questions about visual literacy activities. The second section with Likert type questions, named "Visual Literacy Scale" (VLS), was administered to develop visual literacy scale for prospective teachers. While developing the scale relating preservice teachers, an item pool was created after reviewing literature. According to the purpose of the study the initial scale consisted of 41 items and some of the items were developed by the authors and some of them were obtained from the literature (Branton, 1999; Burmark, 2002; Çam, 2006; Robertson, 2007; Stokes, 2002). Forty-one items, which were determined, were examined by researchers and content validity of the scale was ensured. All items were designed in accordance with a 5-point Likert-type rating scale, ranging from 1 (very unsure) to 5 (very confident).

In terms of the construct validity of the ELS for explanatory analysis, the SPSS 15-program was used. Firstly, in order to test whether or not the data obtained were compatible with the factor analysis, the results of KMO (Kaiser-Meyer-Olkin) and Bartlett Sphericity tests were analyzed. Secondly, principal component analysis with a varimax rotation was used to understand a number of factors and it was performed on the scores of the 41-item. There was no limitation on the factor numbers, because main aim of the study was to determine the dimensions of scale. For this reason, the data were analyzed for factor solutions, but items loaded on unrelated factors.

A variety of criteria was used to determine the number of common factors to retain: the eigenvalue greater than 1 criterion, the scree test, the amount of total variance explained, and the conceptual interpretability of the factor structure. In addition, as suggested in the literature (Büyüköztürk, 2010), the criteria for common factor variance were decided to be .30 minimum in a single factor. For item selection, a minimum difference value of .10, the difference between each item's high factor loading in one factor and high factor loading in other factors, was also accepted. The reliability coefficient of the scale was calculated by employing Cronbach's Alpha and split-half method. Internal reliability estimates were calculated for the total scale and five subscales. Statements of the VLS are presented in Tables 8,9,10, 11, and 12. Findings obtained from the subscales were obtained by frequency and their standard deviations were calculated. Obtained findings were presented via tables.

FINDINGS

Prior to conducting the scale, two indicators were examined to determine whether the sample was appropriate for this analysis. On of them is The Kaiser-Meyer Olkin score that the Kaiser-Meyer Olkin measure of sampling adequacy index was .87 for the sample. This result indicated that the data represented a homogeneous collection of variables that were suitable for the factor analysis. It was understood that this was an excellent value, as it was suggested in the related literature that KMO value should be greater than .60 in order to continue factor analysis of the value found (Büyüköztürk, 2010; Sharma, 1996). Bartlett's test of sphericity was significant for the sample, $X^2_{(300)}$ = 1938, p< .05, indicating that the sample and correlation matrix were appropriate for the analysis.

Table 2. *Initial eigenvalues and explained total variance of the VLS*

Component	Initial Eigenvalues	Extraction Sums of Squared Loadings	Rotation Sums of Squared Loadings
Factor 1	7,40	14,38	14,38
Factor 2	2,37	12,22	26,59
Factor 3	1,42	9,80	36,39
Factor 4	1,36	9,30	45,69
Factor 5	1,17	9,19	54,88

Forty one items were loaded on the eight factors but only 5 factors eigenvalues were loaded over 1. The result of the factor analysis showed that the last version of the scale had five factors. When the factor loading matrix was examined 16 item were excluded from the scale. The five factors accounted for 54,88% of the total variance. Factor 1 accounted for 14,38% of the variance and contained 7 items. Factor 2 consisted of 7 items and accounted for 12,22% of the variance. The third factor accounted for 9,80% of the variance and contained 4 items. The fourth factor accounted for 9,30% of the variance and contained 3 items The final factor consisted of 4 items and accounted for 9,19% of the variance. Factor loading of the VLS items are presented in Table 3.

Table 3. *Factor loading of the VLS items*

Original item numbers	Reorganized item numbers	I	II	III	IV	V
36	1	.750				
37	2	.749				
41	3	.642				
18	4	.582				
38	5	.563				
12	6	.508				
10	7	.478				
20	8		.732			
22	9		.726			
21	10		.640			
23	11		.635			
28	12		.521			
27	13		.442			
7	14		.419			
3	15			.742		
4	16			.657		
1	17			.611		
5	18			.553		

Table 3. *Continue...*

17	19				.817	
16	20				.736	
15	21				.490	
31	22					.844
30	23					.829
29	24					.712
32	25					.563
Cronbach alpha				.82		
		.81	.79	.68	.78	73

Cronbach Alpha reliability coefficient of the scale was calculated as .82 and Cronbach Alpha reliability coefficients of five factors ranged from .68 to .81. (see Table 4). Findings of preservice teachers' written and visual communication tools in daily life are shown in Table 4.

Table 4. *Findings of preservice teachers' written and visual communication tools in daily life*

Written and communication tools	f	%
Computer	101	29,2
Newspaper	112	32,4
Television	75	21,7
Telephone	16	4,6
Magazine	42	12,1
Total		100

Table 4 consists of findings relating the written and visual communication tools followed by preservice teachers in their daily life. 32,4% of preservice teachers follow newspapers while 21,7% of them follow television and 12,1% of them follow magazines. 29,2% of preservice teachers prefer computer while 4,6% of them prefer telephone as the means of communication. Findings relating computer usage aims of preservice teachers are given in Table 5.

Table 5. *Findings of using computer aims of preservice teachers*

Computer usage aims	f	%
for research	107	28,2
for do homework	110	28,9
for communication	83	21,8
for entertainment	80	21,1
Total		100

It is seen that preservice teachers have four main reasons to use computers. These purposes are research, homework, communication and entertainment with the percentages of 28,2%, 28,9%, 21,8% and 21,1% respectively. Findings relating television watching aims of preservice teachers are seen in Table 6.

Table 6. *Findings relating television watching aims of preservice teachers*

Television watching aims	f	%
to watch news	108	34,6
to watch sports programmes	31	10,0
to watch soap opares	118	37,8
to watch show-magazine programmes	55	17,6
Total		100

Findings relating television watching purposes of preservice teachers are seen in Table 6. 37,8% of preservice teachers watch soap operas, 34,6% of them watch it in order to be aware of current changes (watching news) and 17,6% of them watch show programmes and contests. 10% of preservice teachers watch sports programmes.

Table 7. *Frequencies and percentages of television watching and computer experience/years of the preservice teachers*

Variables		F	%
Television watching frequencies	never	30	14,0
	for an hour each day	107	49,5
	for a few hours each day	71	32,9
	for 5+ hours each day	8	3,7
	Total	216	100
Computer usage frequencies	never	3	1,4
	for a few hours each day	111	51,4
	for a few hours in a week	76	35,2
	for a few hours in a month	26	12
	Total	216	100
Computer experiences	never	2	0,9
	1-4 years	85	39,4
	5 years	36	16,7
	5-10 years	73	33,8
	10+ years	20	9,3
Total		216	100

Table 7 shows findings as to television watching and computer usage frequencies of preservice teachers in addition to the information concerning the year of computer usage. It is seen that 13,9% of preservice teachers do not watch television, 49,5% of them watch television for an hour per day, 32,9% of them watch television for 2-3 hours and 3,7% of them watch television at least for 5 hours a day. While 1,4% of preservice teachers do not use computer, 51,4% of them use computer for several hours a day and 35,2% of them use computer for a couple of hours in a week. 12% of preservice teachers state that they use computer for a couple of hours in a month. When we look at computer usage years of preservice teachers, 39,4% of them state that they have been using computer for 1-4 years and 16,7% of them state that they have been using computer for 5 years. 33,8% of preservice teachers have been using computer for 5-10 years and 9,3% of them have been using computer for more than 10 years.

Finding of the VLS subscales were presented in Table from 8 to 12. Findings relating visual awareness of preservice teachers are given in Table 8.

Table 8. *Findings relating visual awareness*

	Statements	$\overline{X}$	Sd.
1	I can understand the disharmony between oral language and body language while communicating.	4,21	0.81
2	I can predict the feelings of my friends by looking at their facial expressions.	4,35	0.79
3	I know that things can be explained in a shorter period of time and more efficiently via visual elements (picture, caricature etc.).	4,54	0.79
4	I prefer using pencils/chalks with different colours instead of black-white pencils/chalks.	4,06	1.03
5	I know that media is a part of visual literacy.	4,13	0.96
6	I pay attention to colours while preparing presentations.	4,40	0.90
7	I know that there are meanings of the shapes, symbols and signs I see.	4,27	0.74
	Mean	4,28	

Findings relating visual awareness of preservice teachers are given in Table 8. General averages of preservice teachers relating visual awareness is $\overline{X}$ = 4,28, which is rather a high level. While the opinions of preservice teachers about the fact that things can be lectured more efficiently and in a shorter period of time by means of visual elements has the highest average ($\overline{X}$ = 4,54), it is also observed that they payi attention to gesture and facial expressions ($\overline{X}$ = 4,35) during their communication with individuals in terms of visual awareness and also they take into consideration colour harmony ($\overline{X}$ = 4,40) while preparing presentations.

Table 9. *Findings relating visual details*

	Statements	$\overline{X}$	Sd.
8	I relate visuals.	4,08	0,81
9	I saw a visual as a whole.	3,96	0,91
10	I see the details of a visual.	4,01	0,82
11	I arrange visuals.	3,96	0,86
12	I can discriminate three-dimensional and two dimensional visuals.	4,24	0,97
13	I use Powerpoint while preparing presentations.	4,50	0,87
14	I know that visuality has a positive effect on speed reading.	4,0	1,05
	Mean	4,10	

Findings of preservice teachers relating visual details are seen in Table 9. It is seen that preservice teachers believe that visuality is important in terms of detail at a high rate ($\overline{X}$ = 4,10). Preservice teachers use Powerpoint software to convey detail in their presentations mostly ($\overline{X}$ = 4,50). Besides, they think that they pay attention to the relation between visuals ($\overline{X}$ = 4,08) and the details of a visual ($\overline{X}$ = 4,01) and that visuality has positive contributions ($\overline{X}$ = 4,0) to speed reading.

Table 10. *Findings relating material-instrument usage*

	Statements	$\overline{X}$	Sd.
15	I use animated visuals (films etc.) while making presentations.	3,89	1,01
16	I use a computer scanner when needed.	4,33	0,70
17	I use two dimensional visuals (poster, picture, graphic, table, map etc.) while preparing presentations.	4,35	0,81
18	I use camera.	3,96	1,13
	Mean	4,13	

Findings relating material-instrument usage of preservice teachers are given in Table 10. Preservice teachers use materials and instruments at a high level ($\overline{X}$ = 4,13) in order to visualize facts and events. Computer scanner is used by them to transfer materials ($\overline{X}$ = 4,33) and two dimensional visual elements such as poster, picture, and graphic are usually preferred ($\overline{X}$ = 4,35). The level of camera usage ($\overline{X}$ = 3,96) to have a realist scene is also high.

Table 11. *Findings relating ability development-visual usage*

	Statements	$\overline{X}$	Sd.
19	I use visuals to develop my expressional abilities.	4.18	0,82
20	I use visuals to develop my oral abilities.	4.17	0,84
21	I interpret graphics and tables to improve my abilities.	4.16	0,78
	Mean	4,17	

Findings relating visual usage in terms of ability development of preservice teachers are seen in Table 11. It is remarkable that all three items are close to each other and preservice teachers use visuals at a high rate ($\overline{X} = 4,17$) to develop their abilities.

Table 12. *Findings relating limitations of visual literacy applications*

	Statements	$\overline{X}$	Sd.
22	I spend less time than it is required for the teaching of visual literacy concepts due to educational deficiency.	2,87	1,13
23	I spend less time than it is required for the teaching of visual literacy concepts due to the objections of lecturers.	2,80	1,13
24	I spend less time than it is required for the teaching of visual literacy concepts due to the lack of material and equipment.	3,20	1.11
25	I think I will spare less time to visual literacy concepts in crowded classrooms.	3,16	1,08
	Mean	3,01	

Findings of preservice teachers relating limitations which may be encountered in developing visual literacy in their students are given in Table 12. The average of limitations which preservice teachers think that they may encounter is $\overline{X} = 3,01$ and it is midlevel. This rate indicates that teachers do not consider limitations that they may encounter effect maintaining visual literacy in students. Most of the preservice teachers stated that problems will stem from lack of material ($\overline{X} = 3,20$) and crowded classes ($\overline{X} = 3,96$).

DISCUSSION AND CONCLUSION

The scale used in this research firstly consisted of 41 items; however, 16 items which were considered to have low factor loading were removed from the scale and then the visual literacy scale, VLS, consisting of 25 items was designed. Cronbach's Alpha reliability coefficient of the scale was calculated as .82. It is possible to say that this reliability coefficient is at a good level (Büyüköztürk, 2010). The developed scale accounted for 54,88% of total variance. There is a percentage of 45,12% out of this rate which was explained by other factors apart from the scale. There are 7 items in the first factor (Table 8). The first factor was named as "*Visual Awareness*" since items of the first factor can be said to be based more on personal perception. It is possible to determine visual awareness of preservice teachers. Cronbach' Alpha coefficient of this factor was calculated as .81. This is a sufficient rate (Büyüköztürk, 2010) and 14,38% of the variance can be represented within the scope of the first factor. There are 7 items in the second factor (Table 9). When items of the second factor were interpreted within themselves, this factor was named as "*Visual Detail*". As it can be deduced from the items, visual details, dimensional details, and using material details of preservice teachers will be revealed by means of the second factor. Reliability coefficient was .79. The second factor was explained 14,38% of the variance, and the first two factors were accounted for 26,59% of total variance. The third factor consisted of 4 items (Table 10) and was named as "*Material-Instrument Usage*". Factor 3 items are related with dimensional visual elements, machines and written material. Reliability coefficient was .68 and the third factor was responsible for 14,38% of the variance. Three factors were accounted for 45,69% of total variance. There are 3 items in the fourth factor (Table 11) and named as "*Ability Development-Visual Usage*" since items can be said to be based more on personal abilities. Alpha coefficient of this factor was calculated as .78 and 9,30% of the variance. The first four factors were accounted for 45,69% of the total variance. There are 4 items in the last factor (Table 12) and this factor was named as "*Limitations*". These items refer to limitations of

visual literacy applications that these items are intended to determine the effects of some problems with a purpose to promote visual literacy of their future students. Alpha coefficient of this factor was calculated as .73 and 9,19% of the variance. All factors were accounted for 54,88% of the total variance.

Visual means and messages are used in daily life when words become inadequate. While we are expressing the love we feel for the person in front of us via words, we try to cherish that moment with a bunch of flowers. When words are incompetent for expressing our thoughts, we use visual means and messages as we stated above. In this way, we try to attribute concrete meanings to messages and thoughts. Visual literacy is very important during the processes of creating and interpreting visual messages. Visual literacy consists of the efforts to interpret the visual using perception strategy of the ones who know the means, experiences and mental abilities. Perception strategy, experience, mental abilities and knowing the means are four basic elements here. The presence of visual elements in today's teaching and learning is increasing as the integration of images and visual presentations with text in textbooks, instructional manuals, classroom presentations, and computer interfaces broadens (Benson, 1997; Branton, 1999; Kleinman & Dwyer, 1999).

Preservice teachers prefer newspapers most among the written communication means, which is followed by computer and television. Doing homework and research are the first among the computer usage purposes. It is possible to say that they use it to make research and projects. When considered from this point of view, computer is utilized in educational terms at a percentage of 60% approximately. Preservice teachers watch sitcoms most on television which is one of the visual means of communication. While the news comes the second in terms of percentage, it is followed by contests and tabloid programs. When we look at computer and television usage percentages, it is possible to say that both means have important roles in terms of visual communication and visual literacy. We can reinforce this opinion depending on the data relating television and computer usage frequency. Approximately, 50% of preservice teachers watch television at least for 1 hour a day while 51,45% of them use computer for a couple of hours in a day. Similarly, 32,9% of preservice teachers spend a couple of hours watching TV in a day while 35,2% of them use computer for a couple of hours in a month. 14% of preservice teachers do not watch television. It is possible to state that television and computer usage increases visual literacy. It is because the sitcoms on television, contest programs, tabloid programs and news increase visual awareness in addition to drawing the attention to visual details. Visual elements of these means are realist, similar and organizer instruments. Shape-ground and light-colour harmonies which are used in these means are effective on visuality. In order to read visual means correctly, it is necessary for the individual to have several improved mental abilities. These abilities depend on age and development level. In attributing meaning to visual means, analyzing, creating and arranging the visuals are the abilities that are required (Heinich, et al., 2002). It is obvious that television and computer make positive contributions in acquiring these abilities.

It was revealed in this study that visual literacy levels of preservice teachers are high as this result was the same with the study of Kıran (2008). However, when we look at the answers given to the items related to the restrictions about visual literacy, it was found out that there is not a serious restriction for preservice teachers even though this is not the same with the study of Kıran (2008). Besides, it was revealed that computer usage rates of preservice teachers are high and this also supports the study of Kıran (2008). The averages of the

answers given by preservice teachers in response to the questions relating visual learning proficiencies being high indicates that most of the preservice teachers have high levels of visual learning and literacy.

When the research of Kuvvetli (2007) named as "A Research about the Effect of Visual Reading on Secondary School Student Achievements in Physics Course" is examined, it is observed that visual reading contributed much to the achievements of students. Since our study revealed that visual literacy levels of preservice teachers are high, the results of Kuvvetli (2007) support the findings of this study.

With this study, a standard scale whose reliability studies were conducted was developed in literature which can determine visual literacy of preservice teachers. Visual literacy of preservice teachers can be determined with the standardization of the scale under five sub-scales which are "visual awareness", "visual details", "material-instrument usage", "ability development-visual usage", and "limitations".

IMPLICATIONS

Preservice teachers will go on to play an important role in educating the future generations of students in Turkey (Tuncer et al., 2009). Using visual materials/elements in communication requires being able to read them, or being a visual writer. It is not possible to say that the present alphabet literacy is adequate for current means of communication. Therefore, future teachers should learn to teach figures to their students in addition to teaching words. In other words, they should build a bridge between text and figures which are written and figurative worlds. In order to achieve this, preservice teachers should possess the visual literacy qualities below (İşler, 2002). These involve interpreting the meanings of visual messages, comprehension and evaluation, conducting a more efficient communication by both applying and resolving the main visual design principles and concepts, producing effective visual messages by using computer and other technological tools in addition to conventional methods and employing visual thinking method to produce conceptual solutions to the encountered problem.

Globalization of the world and the fact that boundaries do not exist any longer except for on the maps. Research by 3M Corporation shows that people are able to process visual information 60,000 times more quickly than textual information. Even this result alone strikingly shows how important visual literacy is for people both in terms of education and daily life (3M Corporation Research, 2001). The literature suggests that using visual elements in teaching and learning yields positive results (Kılıç & Seven, 2007; Sinatra, 1986; Stokes, 2002). In order for visual enhancements to be used most effectively, teachers should possess skills that include the language of imagery as well as techniques of teaching visually; therefore, guidance in the area of visual literacy for instructors is warranted.

REFERENCE

Barth, J.L. & Demirtaş, A. (1997). *İlköğretimde sosyal bilgiler öğretimi.* Ankara: YÖK Yayınları.

Baytekin, Ç. (2004). *Öğrenme öğretme teknikleri ve materyal geliştirme*. Ankara: Anı Yayıncılık.

Benson, P. J. (1997). Problems in picturing text: A study of visual/verbal problem solving. *Technical Communication Quarterly,* 6(2), 141-160.

Branton, B. (1999). Visual literacy literature review. Retrieved April 12, 2010, from http://vicu.utoronto.ca/staff/branton/litreview.html.

Burmark, L. (2002). *Visual literacy: Learn to see, see to learn*. Virginia, USA: ASCD Publication.

Büyüköztürk, Ş. (2010). *Sosyal bilimler için veri analizi el kitabı* (11. Baskı). Ankara: Pegem A Yayınevi.

Çam, B. (2006). *İlköğretim öğrencilerinin görsel okuma düzeyleri ile okuduğunu anlama, eleştirel okuma ve Türkçe dersi akademik başarıları arasındaki ilişki*. Yayınlanmamış Yüksek Lisans Tezi. Eskişehir: Eskişehir Osmangazi Üniversitesi, Sosyal Bilimler Enstitüsü.

Heinich, R., Molenda, M., Russel, J. D. & Smaldino, S. E. (1999). *Instructional media and new technologies for learning*. (Sixth Edition). New Jersey: Prentice-Hall Div.

İşler, A.Ş. (2002). Günümüzde görsel okur yazarlık ve görsel okur yazarlık eğitimi**.** *Uludağ Üniversitesi Eğitim Fakültesi Dergisi*, 15 (1), 153-161.

Keskinkılıç, K. & Keskinkılıç, S.B. (2005). *Türkçe'nin temel beceriler ve ses temelli cümle yöntemi ile ilkokuma yazma öğretimi.* Ankara: Asil Yayıncılık.

Kılıç, A. & Seven, S. (2007). *Konu alanı ders kitabı incelemesi*, 6. Baskı, Ankara: Pegem A Yayıncılık.

Kıran, I. (2008). İlköğretim 5. Sınıf Öğretmen ve Öğrencilerinin Görsel Okuryazarlıkları Üzerine Bir Araştırma. Yayımlanmamış Yüksek Lisans Tezi Çanakkale Onsekiz Mart Üniversitesi Sosyal Bilimler Enstitüsü,

Kırkkılıç, A. & Akyol, H. (2007). *İlköğretimde Türkçe öğretimi*. Ankara: Pegem A Yayıncılık.

Kleinman, E. B. & Dwyer, F. M. (1999). Analysis of computerized visual skills: elationships to intellectual skills and achievement. *International Journal of Instructional Media,* 26(1), 53-69.

Kuvvetli, E. (2007). Görsel Okumanın Ortaöğretim Öğrencilerinin Fizik Dersi Başarılarına Etkisinin Araştırılması, Yayımlanmamış Yüksek Lisans Tezi, Gazi Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara.

Robertson, M.S.M. (2007). *teaching visual literacy in the secondary english/language arts classroom: an exploration of teachers' attitudes, understanding and application*, Unpublished Doctorate Dissertation, Kansas State University, USA. Retrived April 12, 2010, from http://krex.k-state.edu/dspace/handle/2097/269

Sharma, S. (1996). *Applied multivariate techiniques*. New York: John Wiley and Sons Inc.

Sinatra, R. (1986). *Visual literacy connections to thinking*, Reading and Writing. USA:Charles C-Publisher.

Stokes, S. (2002). Visual literacy in teaching and learning: A literature perspective. *Electronic Journal for the Integration of Technology in Education*, 1 (1), 10-19. Retrived April 12, 2010, from http://ejite.isu.edu/Volume1No1/Stokes.html

Tuncer, G., Tekkaya, C., Sungur, S., Cakiroglu, J., Ertepınar, H. & Kaplowitz, M. (2009). Assessing pre-service teachers' environmental literacy in Turkey as a mean to develop teacher education programs. *International Journal of Educational Development*, 29: 426–436.

Wileman, R.E. (1993). Visual communicating. Englewood Cliffs, New Jersey: Educational Technolgy Publications.

Yalın, H.İ. (2004). *Öğretim teknolojileri ve materyal geliştirme* (13.Baskı). Ankara: Nobel Yayın Dağıtım

Yenawine, P. (1997). *Thoughts on visual literacy*. in J Flood, SB Heath, and D Lapp (Eds), Handbook of research on teaching literacy through the communicative and visual art. New Jersey: Lawrence Erlbaum Associates.

3M Corporation Research. (2001). Polising your presentation, 3M Meeting Network Articles & Advice. In, Burmark, L. (2002). *Visual literacy: Learn to see, see to learn*. Virginia, USA: ASCD Publication.