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## **VISUAL LITERACY SCALE: THE STUDY OF VALIDITY AND RELIABILITY**

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**Abstract:** Visual materials like pictures, graphics, and videos that are encountered frequently in the printed and visual areas such as television, web sites, newspapers, journals, and books; as well as in daily life like highways, air ways, cars, and schools are nowadays inseparable parts of daily life. With the development of new technologies and communication methods, these visuals are aimed to be utilized more efficiently. Visuality, which plays an efficient role in the communication, is especially important for individuals, and especially for students, to remember what they have read.

The aim of the present study was to develop a reliable and valid instrument for assessing students' qualifications in visual literacy. The sample of the study consisted of 506 students (307 females/ 199 males) from Sakarya University, Faculty of Education. Ages of the participants ranged between 17 and 30, with a mean of 19.7 (SD = 1.54).

In the validity studies of the instrument, professional views were consulted for face validity and content validity. While the questionnaire for students' visual literacy was being developed, literature review was conducted and an item pool consisting of 43 items was formed. Taking into account the professional views of visual literacy scale, a 5-point likert type scale was applied for referring to the level of evaluation. In the validity studies, initially 5 expert were determined in order to consult for face and content validities. The questionnaire was presented to the academicians from departments of education technology, psychological counselling, assessment and evaluation, and Turkish language, in order to consult for their views. Taking into account the views and critiques, the questionnaire items were subjected to required revisions and deletions. Accordingly, the questionnaire was formed with 29 items assessing students' qualifications in visual literacy and the subsequent reliability and validity studies were conducted using this form. The reliability and validity studies were conducted with the study sample. First of all, exploratory factor analysis (with principle component analysis method) was applied for construct validity. The results of the exploratory factor analysis yielded 6 factors. For questionnaire reliability, internal consistency coefficients were calculated. The internal consistency coefficient of the questionnaire was found to be .94, indicating that the psychometric properties of the questionnaire are within the acceptable limits.

To conclude, the questionnaire for qualifications in visual literacy developed in this study is a reliable and valid instrument that can be used for determining university

students' qualifications in visual literacy. Questionnaire for visual literacy can be utilized in the literature considering the assessment of students' qualifications for visual literacy. It is recommended that, by using this instrument, students' qualifications in visual literacy, the dimensions in which their visual literacy levels are qualified, and whether there is a difference in the qualifications and opinions for visual literacy in terms of demographic variables can be examined.

**Keywords:** Visual literacy, validity, reliability

## **Introduction**

The concept “literacy”, which is defined as “being literate” (Turkish Language Association, 2012) provides a meaning other than functional literacy when it is used as a suffix. The concept “literacy” means to possess knowledge and skills in the related discipline. Examples may include computer literacy, digital literacy, technology literacy, media literacy, critical literacy, web literacy, and visual literacy.

With the increase in knowledge and new communication technologies, multiple literacies came up. Literacy of published and written material which includes verbal communication is not adequate for keeping up to date and increasing the quality of life. It is needed to possess new literacies like media literacy, computer literacy, cultural literacy, social literacy, environment literacy, audio literacy, and visual literacy (Burmark, 2002; Kellner, 2001; Stokes, 2001).

“Visual literacy”; is defined as the power of giving meaning to and building up similar messages for visual messages. As being implied, visual literacy consists of the actions of “reading” and “writing”. In other words, visual literacy is a process that is made up of understanding (reading) and explicating (writing). The concept of visual literacy is first used in the late 1960s (Avgerinou, & Ericson, J, 1997; Debes,1968).

International Visual Literacy Association (IVLA) is the first that accepted the visual literacy definition that was proposed by Debes (1968) and still uses this definition. According to Debes (1968), *“Visual literacy is the name given to a couple of visual efficiencies that is developed by the individual's utilization of visual sensation. The development of these efficiencies is the basis for learning. The individual who possesses these efficiencies has the improved skills for discriminating and interpreting visual motions, objects, symbols, and other things in the environment. By creatively using these efficiencies, the individual communicates with other people and uses visual communication more effectively”* (IVLA, 2011).

There are different definitions of visual literacy in the literature. In order to intensify and unite these different approaches, International Visual Literacy Association (IVLA) has noted four formal definitions (Pettersson, 1993).

- a) An individual's development of her/his visual ability by integrating her/his visual and other sensation organs.
- b) Learning the ability to interpret the communication and composing messages by using visual images.
- c) The ability to convert verbal language to visual image and vice versa.
- d) The ability to conduct research in order to evaluate visual information in the visual environment (Pettersson, 1993).

In the today's information society, the use of visual materials/items makes it necessary for the individuals to become visually literate. Visual literacy is welding to a couple of seeing and viewing capabilities (Robertson,2007). This ability is improved by seeing and concurrently integrating with other sensational experiences. An individual who has a developed visual literacy has the capability of discriminating and interpreting visual actions, objects, symbols and all of the natural and artificial things in the environment (Bangir, 2008). The visually literate individuals can read visual messages, join visual language expressions, and translate visual material to verbal (Robertsen, 2007). The characteristics that the visually literate individual should possess are as follows (Bunmark 2002; İşler, 2002; Roblyer, 1998):

- Interpreting, understanding, and liking the meanings of visual messages
- Communicating more efficiently by applying the basic principles and concepts of visual design
- Producing visual messages by using computer and other technologies
- Utilizing from visual thinking in order to conceptualize solutions for problems
- Communicating more efficiently by both applying and analyzing the basic principles and concepts of visual design
- Producing effective visual messages by using traditional methods, computer, and other technological devices
- Utilizing from visual thinking in order to develop conceptual solutions to the encountered problems
- Perceiving subliminal messages in the pictures used in the advertisements and other contents
- Understanding and interpreting the meanings of visual messages

- Communicating more efficiently by using basic principles and concepts of visual design
- Producing visual messages by using computer and other technologies
- Utilizing from visual thinking for providing solutions to the conceptualization problems

The visual literacy, which has a scope and quality that is subject to continuous change in parallel with the technological developments, has a language approach that possesses original rules and functions. It has become an obligation to learn how to read and understand the compounds of visual language; likewise it is an obligation to learn the meanings of written words and texts. Today, among the basic skills that are needed to be taught in order to prepare an individual for a life where visuality dominates, visual literacy skill has an important place (Akpınar, 2009). Accordingly, visual literacy is defined as a composition of skills. Together with defining, regulating, using, and interpreting visual objects, internalization of analytic thinking, problem solving, and critical and creative thinking skills loom large. Besides, the importance of visual literacy can be conceived in terms of giving meaning and utilizing from the visual information (paintings, graphics, pictures, maps, figures, symbols) that we use in daily life. When the research is examined, it is seen that especially in our country, studies related to the application and development of visual literacy has not taken much attention.

The aim of the present study is to develop a reliable and valid instrument for assessing students' visual literacy efficiencies and their points of view regarding visual literacy, in the light of visual literacy literature and related references.

### **Method**

The research is a scale development study. The present section includes information regarding the sample and the scale development studies.

### **Sample**

The sample of the present study is consisted of 506 students (307 females, 199 males) from Sakarya University Faculty of Education. The ages of the students ranged between 17 and 30, with a mean of 19.7 (SD = 1.54).

### **Scale Development**

In order to develop the efficiency of visual literacy scale for students, the literature is reviewed and an item pool consisting of 43 items was produced. Efficiency of Visual Literacy Scale (EVLS) is

developed in order to assess the students' efficiencies of visual literacy. For describing the degree of acceptance of the EVLS items, 5-point likert type scale was utilized taking into account the expert views. On the 5-point likert type answer sheet, the answer choices and accompanying numbers are as follows: *I can do very easily (5), I can do (4), Maybe I can do (3), I can't do (2), Definitely I can't do (1)*.

In the validity studies, first of all five experts were determined in order to consult for content and face validity. The scale was presented to the academicians from the departments of education technologies, psychological counseling and guidance, assessment and evaluation, and Turkish language, their consultation for content and face validity was taken.

After making necessary corrections and deletions in the scale items in accordance with the experts' views and critics, the scale consisted of 37 items, and the reliability studies were conducted with these items.

The validity and reliability studies were data gathered from the study sample. The data was first subjected to exploratory factor analysis (principle components method) for construct validity. According to the results in exploratory factor analysis, the items which had eigenvalues over 1, the items which had loadings above .30, the items which had a strong loading on a single factor, and the cross-loaded items that had at least .10 differences between each other, remained in the final version of the scale (Büyüköztürk, 2007).

The reliability of the scale was investigated through internal consistency coefficients. The exploratory factor analysis and internal consistency coefficients were computed with SPSS 19 package program.

**Exploratory Factor Analysis (EFA).** EFA aims to determine a limited number of definable meaningful structures that are explained in common by lots of variables (items) (Büyüköztürk, 2007). In EFA, whether a scale item remains in the defined factor is determined according to the strength of the factor loading that indicates the relationship between the item and the factor. The items that receive strong factor loadings are conceptualized as the items that assess the structure that was defined by the factor. While the factor loadings are expected to be .45 and higher, the items that receive factor loadings of .30 are also acceptable (Tabachnik & Fidell, 1989). There are several factor analysis methods. Principle axis, maximum likelihood, and multiple grouping techniques are some of the classical factor analysis techniques. However principle components analysis (PCA) is a frequently applied statistic that is relatively easier to interpret.

## **Findings**

In the present study, exploratory factor analysis and internal consistency coefficients were computed respectively as statistical analyses.

### **Exploratory Factor Analysis (EFA)**

In order to investigate the construct validity of the Efficiency of Visual Literacy Scale for Students, exploratory factor analysis was conducted initially. Previous to this analysis, Kaiser-Meyer Olkin (KMO) test was applied in order to test for the adequacy of the sample. The KMO value was found to be .94. According to Büyüköztürk (2007), this value should be higher than .70, therefore the data was decided to be subjected to factor analysis.

Secondly, Bartlett Sphericity Test was conducted in order to evaluate the multivariate normal distribution characteristics of the data. Obtained significant result ( $\chi^2 = 9730,527$ ,  $p=.000$ ) indicated that the data was applicable for factor analysis (Büyüköztürk, 2007).

EFA was initially conducted with 37 items. According to the preliminary results, the scale revealed 6 factors which had eigenvalues higher than 1, the lowest item loading was .46, however 8 items had high cross-loadings. These 8 items were deleted from the scale and remaining 29 items were again subjected to factor analysis. The results indicated that the items revealed 6 factors which had eigenvalues higher than 1 and the lowest item loading was .46.

These findings indicate that data was applicable for factor analysis. According to the factor analysis with principle components with unrotated method, there were 6 factors that had eigenvalues higher than 1 and they explained 61.05 % of the total variance. The eigenvalues of the 1., 2., 3., 4., 5., and 6. factors were 4.13, 3.30, 3.23, 3.24, 2.86, 2.84, and 1.96, respectively.

The factor analysis results indicated that factor loadings of the items ranged between .46 and .83. Table 1 presents the factor loadings of the items.

**Table 1. Factor Loadings and Explained Variance Values of the Efficiency of Visual Literacy for Students**

Items	Loadings					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
m15	.83					
m16	.83					
m18	.69					
m17	.68					
m14	.67					
m13	.58					
m19	.54					
m28		.75				
m27		.75				
m26		.72				
m29		.64				
m32			.72			
m33			.68			
m34			.66			
m31			.60			
m30			.53			
m36				.76		
m35				.67		
m37				.60		
m23				.50		
m25				.48		
m4					.78	
m2					.73	
m5					.69	
m3					.67	
m1					.46	
m9						.73
m10						.63
m11						.62

### Reliability

The internal consistency coefficient of the 29-item Efficiency of Visual Literacy Scale for Students is found to be .94. Internal consistency coefficients for the subscales are as follows: *giving importance to visuality by using office software*: .89, *illustrating published visual materials*: .83, *visual interpretation*: .86, *discriminating daily encountered visual messages*: .78, *producing visuality by utilizing from tools*: .77, and *perceiving messages in the visuals*: .68. These obtained values indicate high reliability for the scale.



## **Results**

In the present study, Efficiency of Visual Literacy Scale for Students was developed and the psychometric properties were investigated. The items of Efficiency of Visual Literacy Scale for Students were subjected to exploratory factor analysis and a 6-factor structure was occupied. According to the results of the exploratory factor analysis, 29-item and 6-factor solution was decided to be theoretically and statistically compatible. In order to test for the reliability, internal consistency coefficients were computed, indicating that the scale could be employed reliably.

The factor distribution of the scale items was determined as follows: *giving importance to visuality by using office software(factor 1)* : 13., 14., 15., 16. 17., 18., and 19. items, *illustrating published visual materials(factor 2)*: 26., 27., 28., and 29. items, *visual interpretation(factor 3)*: 30., 31., 32., 33., and 34. items, *discriminating daily encountered visual messages(factor 4)*: 23., 25., 35., 36., and 37. items, *producing visuality by utilizing from tools(factor 5)*: 1., 2., 3., 4. and 5. items, and *perceiving messages in the visuals(factor 6)*: 9., 10., and 11. items.

In the Efficiency of Visual Literacy Scale, it is expected from students to determine their frequencies of having the mentioned efficiencies. The lowest score that could be obtained from the dimensions of the scale is 29 and the highest score is 145. Higher scores indicate higher efficiency in visual literacy.

## **Discussion and Implications**

Visual literacy is an important literacy for the people of 21th century. In order to develop a teaching framework and curriculum and assessing the developmental period or existent level of students, this scale a essential first step as well.

Visual Literacy Scale that was developed within the scope of the present study is a reliable and valid instrument for assessing university students' efficiencies in visual literacy.

Efficiency of Visual Literacy Scale is an employable instrument that can be utilized in the literature for assessing students' efficiencies in visual literacy. By using this instrument, it is expected to assess students' display of their efficiencies in visual literacy, in which dimensions their visual literacy is efficient, The scale can be used comperative studies to find that if there is any difference in visual literacy levels according to students charecteristics.

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## Appendix

## GÖRSEL OKURYAZARLIK YETERLİLİKLERİ ÖLÇEĞİ

Madde Numaraları		Kesinlikle Yapamam	Yapamam	Az Çok Yaparım	Yaparım	Kolaylıkla Yaparım
<b><i>Ofis Yazılımları Kullanarak Görselliğe Önem Verebilme</i></b>						
1 (m13)	Yazılarımda konu başlıkları kullanırım					
2 (m14)	Yazılarımda madde imleri kullanırım					
3 (m15)	Yazılarımda grafik kullanırım					
4 (m16)	Yazılarımda tablo kullanırım					
5 (m17)	Yazılarımda resim ve fotoğraflar kullanırım					
6 (m18)	Yazılarımda çizim kullanırım					
7 (m19)	Yazılarımda uygun yazı tipleri kullanırım					
<b><i>Basılı Görsel Materyalleri Tanımlayabilme</i></b>						
8 (m26)	Grafiklerdeki desenleri tanımlarım					
9 (m27)	Görsellerdeki karmaşık şekilleri tanımlarım					
10 (m28)	Haritalardaki özel işaretleri anlarım					
11 (29)	Harita yardımıyla yolumu bulurum					
<b><i>Görsel Yorumlayabilme</i></b>						
12 (m30)	Kavramları görsel şekillerle ifade ederim					
13 (m31)	Yazıları görsel olarak rahatlıkla okunabilecek şekilde düzenlerim					
14 (m32)	Yazdığım yazıların güzel görünmesine dikkat ederim					
15 (m33)	Resim ve fotoğrafları yorumlarım					
16 (m34)	Resim ve fotoğraflar için anlam üretirim					
<b><i>Günlük Hayatta Karşılaşılan Görsel Mesajları Ayırt Edebilme;</i></b>						
17 (m23)	Trafik işaretlerinin anlamlarını bilirim					
18 (m25)	Uzaktan kumandalardaki sembolleri anlarım					
19 (m35)	TV'deki akıllı işaretleri(aile, şiddet, korku, cinsellik vb.) bilirim					
20 (m36)	İnternet sitelerindeki logoyu ayırt ederim					
21 (m37)	İnternet sitelerindeki reklamları ayırt ederim.					
<b><i>Araçlar Kullanarak Görsel Üretebilme</i></b>						
22 (m1)	Fotoğraf, belge vs. taramak için tarayıcı kullanırım					
23 (m2)	Dijital fotoğraf makinesi kullanırım					
24 (m3)	Bilgisayarda fotoğraflarımı düzenlerim(kesme, renklendirme vs)					
25 (m4)	Dijital video kamerası kullanırım					
26 (m5)	Bir video düzenleme programı ile bilgisayarda video klipleri düzenlerim					
<b><i>Görsellerdeki Mesajları Algılayabilme</i></b>						
27 (m9)	Basılı yayınlardaki reklamları incelerim					
28 (m10)	Resim yada fotoğrafların ne ifade ettiğini anlarım					
29 (m11)	Anlatım açısından resimler ve fotoğrafların sınırlılıklarını bilirim					