DEVELOPMENT OF VISUAL LITERACY LEVELS SCALE IN HIGHER EDUCATION

Rumiye Arslan, Gülbin Zeren Nalinci
Amasya University, Faculty of Education
05100 Amasya/Turkey
rumiye.arslan@gmail.com
guzeren@hotmail.com

ABSTRACT
The aim of this study is to develop a scale determining the visual literacy levels of university students. After reviewing the relevant literature a 75 item draft scale was prepared. The scale was applied to 3rd and 4th year students of Education Faculty of Amasya University. Non-functional items have been excluded from the scale as a result of the factor analysis and 41 items have been included. It has been determined that the statements in the scale are gathered in 7 dimensions. These dimensions consisted of: "Identification of the need for visual", "Finding and accessing visual sources", "Analyzing and interpreting the visuals", "Evaluation of visuals and visual sources", "Effective usage of visuals and visual media", "Designing and creating visuals" and "Taking ethical and legal issues into consideration". The General Cronbach Alpha internal consistency of the scale has been determined as α =.947.
Keywords: Visual Literacy, Higher Education, Competency, Performance, Evaluation Instrument

INTRODUCTION
In alignment with the rapid development and change of the information, radical and swift changes take place in the educational process at the level of higher education. These changes increase the quality of the teaching and learning processes by new regulations in higher education, including contemporary methods to the process, so students are prepared for the modern world (Foster, 2008). Also, the formation and the alteration speed of information development have caused substantial changes in the transfer of information from one person to another. The most important change is the way that information is spread. Presently, it is visualized, rather than written or pressed (Tillmann, 2012). Pictures and visuals have almost taken the place of writing in terms of conveying data, information and emotions (Meyer, 2010). Pictures and visuals in the scientific realm have become a medium of self-reflection and analysis. Visuals appear to be both as proposition and as evidence; on the other hand, they are used to document, to design, to model, to experience virtually and to show the visible and non-visible.

VISUAL LITERACY DEFINITIONS
One of the most important considerations in the process of developing an assessment instrument is the correct identification of the characteristics to be measured. Visual literacy is a multi-layered concept. Since it contains many skills, the definition should be formed correctly. Another characteristic of this concept is "trying to express a skill verbally which cannot be basically realized verbally" as Pettersson (1998) stated. As visual literacy contains a number of skills, it is necessary to review definitions that have been given so far. From the review of literature, it is concluded that the visual literacy concept was first defined by Debes (1969):

"Visual Literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication." (Debes, 1969:27)

Many researchers were interested in visual literacy concept after Debes (1969) and tried to make definitions from different angles.

The table below presents the skills and the researchers who use these skills in their definitions.

Table 1: Skills expressed in visual literacy definitions
(Adopted from Ko Hoang, 2000:11)

Skills	People who used the skill in their definition
Recognition	Lacy, 1987
Understanding	Ausburn and Ausburn, 1978; Braden and Hortin,1982, Considine,1986
Using	Ausburn and Ausburn, 1978; Braden & Hortin,1982
Producing	Heinich, Molenda and Russell, 1982; Braden & Hortin,1982; Considine,1986; Lacy, 1987
Connecting	Ausburn and Ausburn, 1978
Interpretation	Heinich, Molenda and Russell, 1982
Analyzing	Lacy, 1987
Evaluation	Lacy, 1987

The definition of the International Visual Literacy Association (IVLA) is still considered to be valid today. Visual literacy is defined by the IVLA as follows:

- "Visual Literacy" is a number of visual competencies with which a human can improve by visual and other sensual experiences.
- "Visual Literacy" is a skill that is learnt in order to make interpretation communication made by visual symbols (pictures) and to produce messages with visual symbols.
- "Visual Literacy" is a skill to convert pictural to verbal and vice versa.
- "Visual Literacy" is a skill to detect and evaluate visual information in the visual environments.
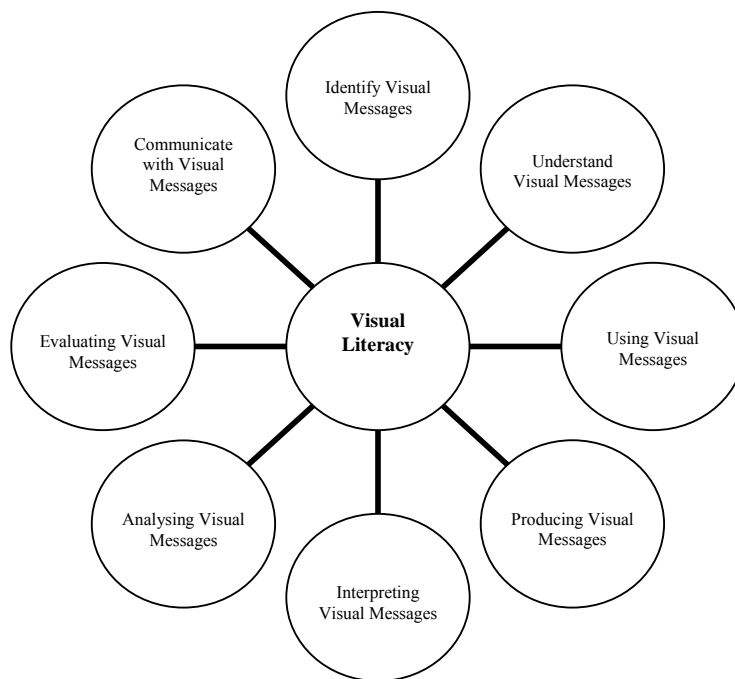

Figure 1: Fields of Visual Literacy

It's rather hard to express all the skills that visual literacy consists of in one definition. Another difficulty is the perpetual increase of visual innovation. In particular, identifying the needed visuals, producing them, producing a new visual from the existing or making changes in the visuals, realizing the changes and not violating the intellectual property rights are the new skills that the digital age requires. Along with this, according to Hattwig (2013), visual literacy intersects with digital technology and digital literacy concepts.

Because digital media has become more extensively used in recent years, some other remarkable definitions have been developed by Philip Yenawind (1997), Larry Johnson (2006) and Susan Metros (2008). According to Yenawind (1997), visual literacy is to determine the meanings of images and to display a set of skills in this process. These skills, in the simplest term, can be varied until the ability to make contextual, metaphoric and philosophic interpretation level which are more complex than identifying an image. In this context, many

cognitive processes, such as association of ideas, investigating, stating opinions, analyzing, determining the situation and classification, take part in the action. Once again, according to Yenawind (1997), fundamental to this literacy is an objective understanding of the visuals. Yet, subjective and affective approaches are also important. In his definition, Larry Johnson (2006) stated that visually literate individuals have an imaginative ability to see and understand the messages communicated with images, as well as to create, modify, and use visual cues and images. According to Susan Metros (2008), visual literacy is the ability to decode and interpret visual messages and also to be able to encode and compose meaningful visual communications. This skill includes the ability to visualize internally, communicate visually, and read and interpret visual images. Also, the skills of deliberative critiquing and ethically evaluating for accuracy and validity of information are within this scope.

In conclusion, the definition adopted by The American Association of College and Research Libraries (ACRL) is stated as follows:

"Visual literacy is a set of abilities that enables an individual to effectively find, interpret, evaluate, use, and create images and visual media. Visual literacy skills equip a learner to understand and analyze the contextual, cultural, ethical, aesthetic, intellectual, and technical components involved in the production and use of visual materials. A visually literate individual is both a critical consumer of visual media and a competent contributor to a body of shared knowledge and culture." (ACRL, 2011)

VISUAL LITERACY COMPETENCY STANDARDS IN HIGHER EDUCATION

Students in higher education can create and share visual contents by means of new digital technologies. However, that prevalence of widely distributed visuals and wide-spread visual media does not mean that all individuals are able to create visual content, use or criticize visuals. Individuals should improve these skills in order to keep up with the visually focused society. Visual literacy skills will enable full participation of individuals in the visual culture.

Visual Literacy Competency Standards in Higher Education has been published by *The American* Association of College and Research Libraries, ACRL. In March 2010, ACRL Information Literacy Standards Committee suggested a proposal to Image Resources Interest Group's, IRIG in order to form visual literacy standards. After this, members of Visual Literacy Standards Task Force, VLTF, gathered information about visual literacy standards by conducting a review of the available literature and sharing the results with an advisory group consisting of librarians, technicians, curators and different managers, as well as arranging meetings with people from different sections of society and different foundations. As a result of the study, the Visual Literacy Task Force text has been created based on the Information Literacy Standards and a first draft was published in 2011.
The Competency Standards have been developed with an interdisciplinary approach, filling in the gap of visual literacy in higher education. Presently, even students can utilize visuals for class, projects and academic studies; yet, there is no standard that can be taken as a reference. With realized studies, visual skill fields have been developed. It has been stated in the learning outcomes that it is by education and training that students will learn to perform these skills.

In all scientific fields, students come across images and visual materials in every lecture they take during the education process. Although students are expected to understand, use and create images in academic studies, it is not possible to say that they meet these expectations all the time. Using visuals in scientific studies requires research, interpretation and evaluation skills particular to the visual materials. It's unthinkable that all students have attained these skills. Thus, the mentioned skills should be gained by including visual literacy education in higher education programs. In particular, higher education standards should include visual literacy skills which are necessary to be successful in the contemporary society. In the arguments of transliteracy, metaliteracy and multimodal literacy, it's emphasized that visual literacy is important for the modern-day student (Hattwig, 2013). There are also many resources on visual literacy and visual research. But until now, the visual literacy concept has been approached from an interdisciplinary perspective. Competencies and student learning outcomes pertaining to it have not been stated.

The Visual Literacy Standards in Higher Education guide professors who want to help their students by forming a scientific framework in order to ease and improve their visual literacy skills by using and creating the visual media with a critical approach in their professional lives. With the help of standardized fields, performance indicators and learning outcomes, students who study in different disciplines can presently be observed, measured, compared and discussed using a common language. In this study, seven different standard fields have been determined. In an interdisciplinary, higher education environment, a visually literate individual is able to:

- Determine the nature and extent of the visual materials needed

- Find and access needed images and visual media effectively and efficiently
- Interpret and analyze the meanings of images and visual media
- Evaluate images and their sources
- Use images and visual media effectively
- Design and create meaningful images and visual media
- Understand many of the ethical, legal, social, and economic issues surrounding the creation and use of images and visual media, and access and use visual materials ethically.

Based on the Competency Standards published by the Visual Literacy Standards Task Force, twenty four performance indicators have been determined. For the formation of these indicators, student learning outcomes have been stated in the visual literacy trainings.

Standard One: The visually literate student determines the nature and extent of the visual materials needed.
Performance Indicators:
1. The visually literate student defines and articulates the need for an image.
2. The visually literate student identifies a variety of image sources, materials, and types.

Standard Two: The visually literate student finds and accesses needed images and visual media effectively and efficiently.
 Performance Indicators:
1. The visually literate student selects the most appropriate sources and retrieval systems for finding and accessing needed images and visual media.
2. The visually literate student conducts effective image searches.
3. The visually literate student acquires and organizes images and source information.

Standard Three: The visually literate student interprets and analyzes the meanings of images and visual media.
Performance Indicators:
1. The visually literate student identifies information relevant to an image's meaning.
2. The visually literate student situates an image in its cultural, social, and historical contexts.
3. The visually literate student identifies the physical, technical, and design components of an image.
4. The visually literate student validates interpretation and analysis of images through discourse with others.

Standard Four: The visually literate student evaluates images and their sources.
Performance Indicators:
1. The visually literate student evaluates the effectiveness and reliability of images as visual communications.
2. The visually literate student evaluates the aesthetic and technical characteristics of images.
3. The visually literate student evaluates textual information accompanying images.
4. The visually literate student makes judgments about the reliability and accuracy of image sources.

Standard Five: The visually literate student uses images and visual media effectively.
Performance Indicators:
1. The visually literate student uses images effectively for different purposes.
2. The visually literate student uses technology effectively to work with images.
3. The visually literate student uses problem solving, creativity, and experimentation to incorporate images into scholarly projects.
4. The visually literate student communicates effectively with and about images.

Standard Six: The visually literate student designs and creates meaningful images and visual media.
Performance Indicators:
1. The visually literate student produces visual materials for a range of projects and scholarly uses.
2. The visually literate student uses design strategies and creativity in image and visual media production.
3. The visually literate student uses a variety of tools and technologies to produce images and visual media.
4. The visually literate student evaluates personally created visual products.

Standard Seven: The visually literate student understands many of the ethical, legal, social, and economic Issues surrounding the creation and use of images and visual media, and accesses and uses visual materials ethically.
Performance Indicators:

1. The visually literate student understands many of the ethical, legal, social, and economic issues surrounding images and visual media.
2. The visually literate student follows ethical and legal best practices when accessing, using, and creating images.
3. The visually literate student cites images and visual media in papers, presentations, and projects.
   (ACRL, 2011)

Among all studies, the Visual Literacy Competency Standards is the most comprehensive study that can be used as a basis for measuring the competencies of the university students in this field.

In this study, a survey has been developed in order to measure visual literacy levels of the university students by taking standards, performance indicators and learning outcomes identified by ACRL (2011) into consideration.

PURPOSE OF THE RESEARCH
The purpose of this research is to develop a new, valid and reliable Visual Literacy Scale that will measure the visual literacy levels and skills of university students.

METHOD
This study has a descriptive quality. A scale has been developed and utilized by examining the related literature. In-line with the data gathered, a new and useful scale has been developed by subjecting scale items to factor analysis, excluding non-functional items and determining the extent of the scale.

STUDY GROUP
The research sample is composed of 414 students, 254 women and 160 men, studying at Amasya University's Faculty of Education. The study was conducted in the fall semester of the 2012-2013 academic year. In forming the study group, a random cluster sampling was taken from 3rd and 4th year students of the group. The reason for choosing this grade level is the assumption that the students have become more experienced in using visuals during their time at university and will have given at least one presentation by the date of this research. The distribution of the study group according to age and gender is shown in Table 3.

Table 2: Distribution of the Study Group According to Age and Gender

Departments of Instructor Candidates	Gender Female	Male	Total
School Teaching	121	53	174
Psychological Counseling and Guidance	9	7	16
Social Sciences Teaching	26	34	60
Pre-school Teaching	29	6	35
Science Teaching	24	8	32
Physical Training and Sports Teaching	17	24	41
Turkish teaching	28	28	56
Total	254	160	**414**

FORMING A DRAFT ASSESSMENT INSTRUMENT
Before developing an assessment instrument, related literature (Debes, 1969; Yenawind, 1997; Tillmann, 2012; Foster, 2008; Meyer, 2010; ACRL, 2011, Avgerinou, 2011; Brumberger, 2011; Felten, 2008; Hattwig, 2013; Yeh, 2010) was examined by collecting publications of related individuals and foundations. This was the basis for the theoretical framework this study establishes trustworthy in regards to visual literacy. Included in the review of the literature was "Visual Literacy Competency Standards in Higher Education" (ACRL, 2011), a contemporary and comprehensive study which has already been referenced. In this study published by ACRL (2011), seven standard fields and twenty-four performance indicators-with a total of one hundred learning outcomes,-have been identified. In the preparation of the scale, the item pool of these 100 items was formed by using both learning outcomes and performance indicators. Then, the items were reduced to 75. Insight into the breadth and scope was obtained by subjecting the prepared scale to the opinion of an assessment specialist and a linguist, and corrections have been made in line with the suggestions. The scale, which the specialists examined, received approval and is ready for implementation. Every item in the survey consisted of 5 Likert Type scale. The answering method of the questions is "(1) absolutely disagree, (2) disagree, (3) neutral, (4) agree, (5) absolutely agree". The maximum points that can be received from the visual literacy skills scale is 375, while the minimum grade is 75. The high grades indicate that the visual literacy skills are high; whereas low grades indicate that the visual literacy skills are low.

DATA ANALYSIS

The prior condition in the scale development study is to have an adequate number of samples. There are different ideas about the number of samples, but it is commonly accepted to keep the sample size five or ten times of the number of items (Büyüköztürk, 2002). With this in mind, 414 higher education students could be adequate. The Higher Education Students Visual Literacy Scale with 75 items was applied to the study groups during one class period with help from the respective professor. Gathered data has been entered into SPSS 20.00 software in order to ensure validity and reliability of the scale analysis statistically. In order to determine the suitability of the gathered data, the factor analysis Kaiser-Meyer-Olkin (KMO) and Bartlett Test analysis were performed and KMO= 0,944; Bartlett x^2=16865,082: sd=2775 (p=0,000) was determined. After producing a sufficient KMO value, a factor analysis was performed in order to determine the factorial structure. Exploratory factor analysis was performed based upon the gathered data. The scale break down was determined by a principal components analysis. Then, factor loads were examined by using the Varimax rotation technique. Analyses were renewed by eliminating the items for which factor loads were less than .30. The coefficient of internal consistence was determined by using the Cronbach Alpha (0.947) technique for reliability study of the scale. The item-total test correlations were examined in order to identify the items in the Visual Literacy Levels Scale in Higher Education and eigenvalue calculations were made in identifying scale factors.

FINDINGS

In this part of the study, findings and interpretations are offered regarding the validity and reliability studies of the ultimate scale pertaining to the 41 items that remained from the factor analysis of the items in the Visual Literacy Scale in Higher Education. The Kaiser-Meyer Olkin (KMO) coefficient was calculated in order to test the structure validity of the scale.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,940
Bartlett's Test of Sphericity	Approx. Chi-Square	8009,827
	df	820
	Sig.	,000

As Table 4 shows, the KMO value has been found to be 0,94. According to Büyüköztürk (2009), this value is a perfect value. Yet, according to the Barlett test result (x^2=8009,827, p.=.000), it was understood that the factor analysis can be made because it was determined that the data reveals a meaningful difference. The Cronbach Alpha value of the scale was calculated α= .947 in the reliability test. It was noted that the factor loads of the 41 items left in the scale (without rotation) varied between 0,436 and 0,736. In addition, these factor loads varied between 0,419 and 0,787 with rotation after implementation of the Varimax Rotation Technique.

Table 4: Communality

Item No.	Factor Load	Item No.	Factor Load	Item No.	Factor Load	Item No.	Factor Load
m1	,690	m16	,477	m44	,580	m69	,582
m2	,736	m21	,534	m47	,688	m70	,660
m3	,680	m22	,699	m48	,582	m71	,612
m4	,456	m23	,724	m52	,455	m72	,600
m9	,436	m24	,655	m58	,471	m73	,561
m10	,521	m25	,532	m59	,477	m74	,609
m11	,627	m30	,462	m60	,670	m75	,517
m12	,631	m31	,552	m61	,599	m65	,553
m13	,584	m33	,535	m62	,535		
m14	,554	m34	,572	m64	,503		
m15	,539	m35	,550	m66	,451		

In the analysis of Table 6; total variance explained gives the eigenvalues before and after rotation and indicates 7 factors. The number of factors was determined as eight in the first implementation of the analysis and the total variance explained was 59,774%. However, only seven aspects have been taken into consideration. In the second

analysis, the number of factors manually entered was 7. As a result of this, it has been determined that the items are in accordance with the considered aspects. Because of this, the number of factors has been restricted. The first factor explains 10,43 %, the second factor explains 9,378 %, the third factor explains 8,366 %, the forth factor explains 7,625 %, the fifth factor explains 7,597 %, the sixth factor explains 7,355 % and the seventh factor explains 6,45 % of the variance. The cumulative variance, which eigenvalues have revealed, is 57,201% of the total variance. It has been accepted that factor loads of more than 0.30 and % 40 total variance explained are adequate in the behavioral sciences. In this case, the quantity explained by the seven factors indicates that the scale is more than adequate (Büyüköztürk, 2009).

Table 5: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13,501	32,930	32,930	13,501	32,930	32,930	4,276	10,430	10,430
2	2,974	7,255	40,185	2,974	7,255	40,185	3,845	9,378	19,808
3	1,673	4,081	44,265	1,673	4,081	44,265	3,430	8,366	28,174
4	1,527	3,725	47,990	1,527	3,725	47,990	3,126	7,625	35,799
5	1,338	3,263	51,253	1,338	3,263	51,253	3,115	7,597	43,396
6	1,247	3,041	54,295	1,247	3,041	54,295	3,016	7,355	50,751
7	1,191	2,906	57,201	1,191	2,906	57,201	2,644	6,450	57,201
8	1,055	2,573	59,774						

The number of the scale aspects is decided by examining the "Total Variance Explained" table and "Scree plot" graphic. As is seen in Graphic 1, there is a sharp decline until the 3rd point. From the 3rd to the 8th point, the decline continues. But, as the decline becomes horizontal in other factors, their contribution to the variance gets closer to each other (Büyüköztürk, 2002). Based on this analysis and the aforementioned reasons, it can be concluded that the scale should have 7 dimensions.

Graphic 1: Scree Plot
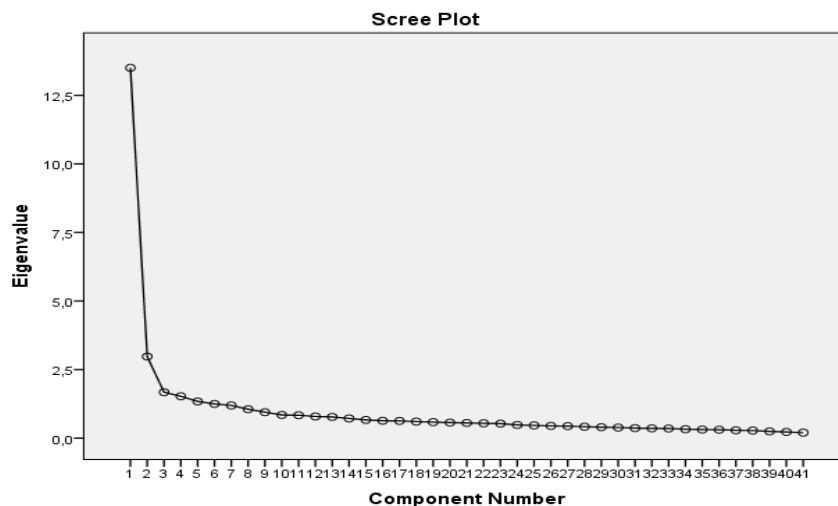
In table 7, it can be seen that the scale consists of 41 items and 7 aspects as a result of the analysis of the calculated rotational factor loads of the items. The dimensions which were obtained by using rotational factor loads are as follows:
1. Dimension: Taking ethical, legal and social issues about visuals into consideration and implementing them.
2. Dimension: Designing and creating meaningful visuals and visual media contents.
3. Dimension: Finding visuals and visual media contents, accessing them efficiently and effectively.

4. Dimension: Evaluating visuals and resources where visuals are.
5. Dimension: Identification of the quality and the scope of the needed visuals.
6. Dimension: Analyzing and interpreting the visuals and visual media.
7. Dimension: Using visuals and visual media effectively.

Table 6: Factor Loads of the Items in the Rotated Principal Components Analysis according to Principal Axis of Visual Literacy Scale in Higher Education

Rotated Component Matrix [a]

Items	Factor Loads before Rotation	Component			Item-Total Test Correlation	Items r	Factor Loads before Rotation	Component				Item-Total Test Correlation
		1	2	3				4	5	6	7	
m71	,612	,693			,554	m31	,552	,640				,543
m72	,600	,691			,555	m33	,535	,616				,533
m74	,609	,673			,516	m34	,572	,608				,570
m75	,517	,673			,472	m30	,462	,590				,454
m70	,660	,662			,513	m35	,550	,582				,566
m69	,582	,648			,539	m2	,736		,787			,506
m73	,561	,625			,587	m3	,680		,767			,486
m60	,670		,780		,516	m1	,690		,752			,475
m61	,599		,682		,567	m4	,456		,571			,445
m65	,553		,572		,607	m23	,724			,738		,604
m62	,535		,565		,579	m24	,655			,729		,528
m59	,477		,533		,585	m22	,699			,681		,563
m58	,471		,490		,576	m25	,532			,505		,622
m64	,503		,473		,597	m21	,534			,498		,597
m66	,451		,444		,580	m47	,688				,748	,485
m11	,627			,692	,574	m48	,582				,663	,525
m12	,631			,624	,541	m44	,580				,556	,601
m13	,584			,617	,524	m52	,455				,419	,528
m14	,554			,596	,567							
m10	,521			,591	,540							
m16	,477			,453	,554							
m9	,436			,437	,360							
m15	,539			,428	,559							

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

When Table 7 is analyzed, it can be determined that the factor loads of items composing the Visual Literacy Scale in Higher Education before rotation varies between .436 and .670 where factor loads after rotation varies between .419 and .787. In order to determine the distinctiveness of the items in the Visual Literacy Scale, an item-total test correlation has been examined. As is seen in Table 7, the item-total test correlation values of the scale vary between .360 and .622. According to Büyüköztürk (2009), the factor load value being 0.45 or higher is a good criterion for the selection. It should be mentioned that the distinctivenesses of the items in the Visual Literacy Scale are high, as item-total test correlation values in the scale are higher than .30. Reliability coeffients related to the Visual Literacy Scale, eigenvalues and explained variance ratios are shown in Table 8.

Table 7: Data belong to the Evaluation of Visual Literacy Skills in Higher Education

Sub Aspects of Scale	Working Items	Excluded Items	Reliability Coefficients of Factors α	Explained Variance Ratios of Factors
1. **Identification of needed visuals**	1,2,3,4	1	.811	7,597
2. **Finding and accessing the visual resources**	9,10,11,12,13,14,15,16	4	.823	8,366
3. **Analyzing and interpreting the visual**	21,22,23,24,25	7	.844	7,355
4. **Evaluating visuals and their resources**	30,31,33,34,35	7	.781	7,625
5. **Using visuals and visual media effectively**	44,47,48,52	12	.753	6,45
6. **Designing and creating visuals**	58,59,60,61,62,64,65,66	3	.861	9,378
7. **Taking ethical and legal issues about visuals into consideration**	69,70,71,72, 73,74,75	0	.861	10,43
General		41	34	α =.947	57,201

CONCLUSION

Universities ultimately follow and implement technology in education and training as they are the pioneers of social and technological developments. The increasing application of technology in educational and training environments leads to a greater usage of visual materials. This requires students to obtain necessary information through visual materials. In higher education, both students and lecturers share the information more efficiently via digital technologies in e-learning, distant learning and face-to-face learning methods. In this context, students in higher education should be able to both correctly analyze the visuals and pictures they receive and create visuals. Additionally, students in higher education should be able to access existing visuals through information and communication technologies. Besides, they should have knowledge on different topics about the accessed visuals and behave accordingly. Because of this, the aptitude of the students in this field should be determined by taking different aspects of visual literacy skills into consideration. Skill levels of students should be elevated in the light of information achieved by this way. In line with these considerations, a need to develop a new assessment instrument related to visual literacy for students in higher education has arisen. In this study, the aspects of the scale have been determined by reviewing the literature, and item expressions suitable for these aspects have been developed. A draft scale, which is subjected to different textual examinations, was analysed with validity and reliability tests after factor analysis. The Kaiser–Meyer–Olkin (KMO) test was performed in order to identify the suitability of collected data for factor analysis. As a result of the test, the KMO value was determined as .94. Non-functional questions were excluded from the scale as a result of the factor analysis, and factor loads were created into a 41-item scale varying between .436 and .736. As a result of the rotation process, it was determined that the statements in the scale can be grouped into 7 factors. These factors consist of: "Identification of the need for visual" 4 items, "Finding and accessing visual sources" 8 items, "Analyzing and interpreting the visuals" 5 items, "Evaluation of visuals and visual sources" 5 items, "Effective usage of visuals and visual media" 4 items, "Designing and creating visuals" 8 items and "Taking ethical and legal issues into consideration" 7 items. The General Cronbach Alpha internal consistency ("reliability") of the scale has been determined to be α =.947. The explained total variance value of the scale was calculated as 57,201%. Therefore, a valid and reliable scale has been developed which can help measure the visual literacy levels of students studying in universities.

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