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# The study of visual reading strategies scale of validity and reliability in comprehension teaching

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## Abstract

The purpose of this research is to develop a scale which intends to measure levels of primary school teachers in using visual strategies in comprehension teaching. Scale form has been prepared in 50 items likert structure by profiting from concerned academicals resources and thesis's. This scale tool is consisted of two sections. In the first section, there are items which aim to determine the levels of branch teachers' participation to the questions that have been asked regarding application of visual strategies. In the second section, there are items which aim to determine the levels of strategies in comprehension teaching. The application of the scale has been put into practice by branch teachers of center primary schools in Siirt, in 2008-2009 teaching year. In the structure validity of scale, the rate of KMO test has been found as 0.912, the rate of Barlett Sphericity test has been found as 6282,592 ( $p=0.00$ ). The coefficient reliability of scale has been appointed as 0.93. It has been applied to Sperman Brown two semi- test correlation analyses in order to ensure the reliability of scale. One of the ways that has been resorted to determine inner- consistency of scale has been to test sub 27% and top 27% groups of items of average scores differences composed of according to total scores of test by using Independent Samples Test.

*Keywords: Comprehension, Visual Reading, Scale, Validity, Reliability.*

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## 1. Introduction

Reading activity is an effective process redounding information capacity of mankind, shaping of ideas and beliefs, acquiring his personality. This process is an intellectual activity in which individual's biological, psychological, physiological properties work in collectivity.

In the essence of this activity, there is 'comprehension' target. So many different, but basically based on comprehension definitions, corresponding reading process have been made: Reading is an inferring activity from written symbols with common works of cognitive behaviors and psychomotor abilities; it is converting of writing into the meaningful sounds (Demirel and Şahinel, 2006, 81). Reading is a constructing meaning process in which foreknowledge has been used, based on efficient communication between author and reader, in terms of appropriate method and goal, in a regular atmosphere (Akyol, 2005). Reading is a complicated consideration act based on constructing meanings actualizing in the brain. Reading, seeing, perception and comprehension act of writing with words, punctuations and the other components (Ünalın, 2001, 86).

Reading is an act that reader firstly perceives the signs of chart marked with language code, emotion, idea, judgment and comments of authors then it is a perceiving of content containing some mental procedures at the end of a cognitive process (Kuzu, 2003, 36). Reading is a complicated process presenting physiological, intellectual and

spiritual aspects such as comprehension, analysis and assessment of sense and opinions in the writing (Sever, 1995, 15).

Reading process is a developing active procedure ranging from easy reading process which includes written codes and visual shape to the high grade abilities, containing concepts and high grade writings, texts giving explanatory information and reading spiritual writings (Nassaji, 2003, 261). Nevertheless, mankind not only write written text to learn, he also read them by ascribing means to the events, shapes, symbols he comes across. This shows that it is not possible to content only with written texts in order to be able to implement meaningful learning and also shows the necessity of being able to read texts including visual indicators. Using visual indicators and objects is accepted as an important strategy efficient in both listening and actualizing comprehension for reading in the process of comprehension from read texts: it is possible to clarify this idea shortly with the idiom “A picture is equivalent to thousands of words.” (Gambrell and Koskinen, 2001, 305) Because when a person reads, visual objects given along with the texts ensure healthier organizations, comments and remainders related to the text. As visual objects alert to more than one sense of organ and draw attention of the students, they facilitate learning (Güngördü, 2003).

The association between reading comprehension and visual images can be explained by intellectual imagination theory. Intellectual imagination theory proposes to submit information providing organization from read text, association and revision of information reconstructing it (Gambrell and Koskinen, 2001, 305). The most important cognitive theory is double coding theory that was developed by Paivio (1971) explaining the relation between consisting visual imagination with reading comprehension, reading visual text and comments. Double coding theory takes into account both verbal and visual coding together and advocates that understanding in that ‘Learning’ actualizes by means of verbal and visual coding which is in interaction with it. The competence of reading visual messages, interpreting them and giving them meanings is defined as visual reading. Visual Reading can be defined as an integrated reading competence that contains being able to read not only written texts but also all visual indicators that are both active and inactive. Visual Reading, in other words, is a competency of reading comprehension and interpreting information presented with pictorial and charting images (Wileman, 1993, 14). Visual Literacy is a competency of interpreting visual messages properly as well as expressing readings by means of visual description and expression. Visual Literacy is an accomplishment of understanding, using images and indicators and expressing your self with them. The person possessing visual literacy;

- Can make of objects by distinguishing
- Can compose efficient and meaningful visuals in a specified area
- Comprehends and appreciates what others learnt from visuality
- Can make animation in mind

Researches made corresponding with learning has indicated that most of the learning actualize by means of visual descriptions. While some students can learn easier with visual descriptions, some students who learn verbally easier, learn most of the concepts with visual supports (Demirel and Oth., 2004, 27). Visual objects are accepted as the most rational tools that provide individuals learning and teaching process and interactional communication between individuals. Thus, even though ancient peoples using pictures drawn in caves and walls of temples as a means of communication or instructive show variation parallel with technologic and social developments; it has never lost its importance (İşler, 2003).

It is a fact that visual objects have a significant contribution in actualizing meaningful learnings. Visual components provide contributions such as motivating them by taking their attentions, keeping alive their attentions, providing to develop sentimental responses, concreting concepts, simplifying concepts that are hard to comprehend, arranging information by means of shapes, organizing relations between concepts and visualizing with reflection shapes (Demirel ve Oth., 2004, 27). Hodgdon ranges the contributions of visual strategies in learning, like that: they provide a conscious interaction between reader and text, they redound learner’s attention, they can be carried out and individualized, they strengthen describing and remembering words, they motivate learners, provide quick learning in order to complete a subject or duty, rescue from dependence in learning and increase to be independent learners, they provide learning by describing subjects step by step. It is absolute that writing advocated with visual

constituents enhances comprehension levels. Visuals in books are much more important in terms of students having reading problems. Rusted and Cotlheart (1979) determined that even though poor readers had hesitant between text and visuals at the time of reading, efficient readers had slightly used pictures while reading. This show that visual constituents are much more resources helping to comprehend than being tools as visual ornament for poor readers (Akyol, 2006, 119 ). According to Bloom (1979), learners having poor competency of reading comprehension also perform low academical success. One of the basic precautions that can be taken against failure in students' academical successes is that it is an obligation to enhance reading comprehension competence and to develop competence of reading and comprehending visuals integrated with this ability. Competence of reading visuals such as shape, symbol, picture, tableau, chart, body language, nature and social events that are apart from written texts but have contribution in comprehending was firstly described as a separate learning field under the name of “visual reading” in Turkish lesson which has been carried out from 2005 till now in primary education programme. To be able to improve competence of visual reading is only possible with making use of strategies that supply visuality and imagination. Some of the visual strategies considered to enhance reading comprehension and meaningful learning are:

- Making narrating texts visual with pictures
- Composing intellectual indicators while reading
- Using pre-learnings including visual indicators
- Using map chart and sphere summarizing written texts like tableau, picture, chart etc. With visual objects
- Constructing meaning for objects like newspaper, magazine, poster, television, computer, photograph etc.
- Using concept maps
- Supporting lesson activities with caricatures.
- Arranging drama, game in the class, making play dummy etc.

Visual strategies contribute to students' learning meaningfully by reconstructing a text with visual shapes. When taking into account this, visual strategies are present in basic strategies suggested by Constructivist Learning Theories which take objective of reconstructing information by learner. Because students actualize new, meaningful and permanent learnings by visualizing a narrative and explanatory text having been read by means of organization and summary with made story, information or concept maps.

## **2. Method**

The purpose of this study is to cultivate a scale aiming to measure the grade of using visuality strategies of primary education branch teachers in apprehension teaching.

The scale form has been prepared in likert construction of 50 items by making use of related theoretical resources and theses, this scale means is consisted of 2 sections. In the firs section, it contains items aiming to determine participation level of branch teachers to the questions related to carrying out visuality strategies. In the second section, there are items aiming to determine level of class and branch teachers' carrying out visuality strategies in apprehension teaching. In the scale, items such as 'I don't agree at all', 'I don't agree', 'I'm hesitant', 'I agree', 'I exactly agree' and 'I always do', 'I generally do', 'I do from time to time', 'I rarely do', 'I don't do', are marked as 1,2,3,4,5 respectively. Pilot implementation has included branch teachers giving lessons actively in 2007-2008 Education year, in primary schools of Ankara Çankaya Town National Management. After sorting out teachers completing the scale form in deficiency, data receiving from the rest of 215 teachers have been evaluated. The scale's reliability factor has been detected as (cronbach-alpha) 94. For the basic application of the scale, branch teachers in charge of 2008-2009 Education year in Siirt Center primary schools have been selected. After teachers completing the scale form in deficiency or completing it without paying required care were sorted out, the scale form completed by the rest of 236 teachers have been analyzed.

### 3. Findings

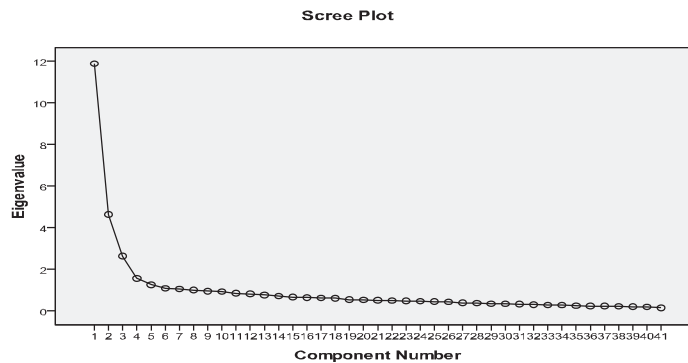
Before factor analysis is made, the compatibility of data to the factor analysis has been determined with KMO and Bartlett Sphericity Test. Because, in order to make factor analysis, it is suggested that the rate of KMO test be at least 0.60 and Bartlett Sphericity test emerge meaningful (Büyüköztürk, 2004, 120). For the construction validity of the test, the rate of KMO test has been ascertained as 0.912 and Bartlett Sphericity test as 6282,592 ( $p < 000$ ). This also has shown that data are appropriate for factor analysis. Factor analysis has been repeated until there are no successive items. At the end of the repeated implementations of factor analysis, the rate of KMO test has been ascertained as 0.915 and the rate of Bartlett Sphericity test has been ascertained as 4835,289 ( $p < 000$ ). Items whose factor load is below 0.30 are discarded from the scale. It has been observed the scale is consisted of totally four extents and 40 items. According to the findings acquired from the analysis it has been observed that after eliminating matters whose rate of factor load analysis are below 0.30, the rest of 40 items essence value of which is greater than one have been collected under four factors. Variance explained corresponding to these four factors is 51,72%. It has been observed that common variances described related to these four factors alter between 0,296 and 0,728. Table 1 show essence value obtained related to four factors, variance percentage and total variance percentages.

**Table1. The Findings Related to Factors**

Factor	Essence Value	Variance Percentage	Total Variance Percentage
1	11,86	29,66	29,66
2	4,60	11,52	41,19
3	2,64	6,60	47,79
4	1,571	3,90	51,72

As it is seen in Chart 1, essence values of four factors are in order of 11,86, 4,60, 2,64 and 1,57. All these values are above one. The total amount of variance stated by four factors in the scale is 51,72%. While the first factor explains 29,66% of variance, the second factor explains 11,52% of variance, the third factor explains 6,60% and the fourth factor explains 3,90% of variance.

**Figure1. Graphic of Self-Value**



Significant factor number has been described as four, according to essence value graphic. This condition has clearly been observed in line chart drawn according to the essence value. In the Chart, after the first factor, a decrease with high acceleration has been observed. Whereas this condition has shown that the scale could have a general factor decrease, decrease with acceleration has continued till fourth factor. According to this situation, it may be thought that the scale could be four factors. The following Chart shows question items and factor matters relative to them.

Table2. The Factors and Factor Load Rates

The First Factor Rate		The Second Factor Rate		The Third Factor Rate		The Fourth Factor Rate	
S7	,758	S30	,765	S48	,813	S20	,816
S16	,729	S28	,715	S46	,795	S19	,795
S2	,697	S29	,705	S47	,775	S21	,766
S8	,693	S31	,696	S49	,731	S18	-,700
S3	,692	S27	,648	S45	,560		
S15	,689	S39	,630	S50	,558		
S10	,684	S34	,622				
S13	,679	S33	,610				
S4	,665	S38	,597				
S12	,659	S37	,595				
S6	,616	S40	,592				
S17	,557	S25	,582				
S9	,527	S36	,570				
S22	,517	S35	,535				
S11	,515	S26	,490				

When question items containing assigned factors have been examined, it could be said that the items collected in the first extent of the factor are “Contribution of Visual Strategies to Comprehension”, the items collected in the second extent of the factor are “Visualization Activities”, the third items collected in the extent of factor are “Visualization of Reading Texts” and the items collected in the fourth extent of the factor are “Limitations of Visual Reading Strategies”.

Composed of 40 items, the scale’s general cronbach alpha reliability coefficient has been assigned as 0.92. In the grade of factors, it has been ascertained that the first factor’s cronbach alpha reliability coefficient is 0.91, the second factor’s cronbach alpha reliability coefficient is 0.92, the third factor’s cronbach alpha reliability coefficient is 0.92, the fourth factor’s cronbach alpha reliability coefficient is 0.87, the fifth factor’s cronbach alpha reliability coefficient is 0.93.

Moreover, in order to ensure the scale’s reliability, Two-Half Test reliability has been looked into. Spearman Brown Two-Half Test Correlation Analysis has been consulted. For this, it has been ascertained that the first 20 items of the test are the first half, the last 20 items are the second half. It has been identified that cronbach alpha reliability coefficient of the first half is 0,87; cronbach alpha reliability coefficient of the second half is 0,92.

One of the ways applied to determine internal consistency of the scale has been to examine sub-27% and upper-27% group’s differentiations between items according to the total points of the test composed by using independent samples **t test**.

Table3. The Sub and Upper Groups, Independent Samples t Test Findings

Groups	N	Percentage	Arithmetic Average	Standard Deviation	F	T	Exemption Rate	p
Sub	63	27	123,80	12,58	1,45	-24,32	124	,00
Up	63	27	170,23	8,43				

In case of the possibility of difference’s coming out meaningful in large groups, t test analysis has been made by taking the rate of meaningfulness both 0,05 and 0,01 rate as criteria. In the consequences of both analyses, a meaningful difference has been observed in favor of upper groups between both in upper group’s item total average and sub-group’s item total average. By these indicators, it could be said that the internal consistency of The

Scale of Visual Strategies are high and the items distinguish individuals from each other by the point of evaluated behavior.

In the following Chart, factor rate, coefficient and the rate of item overall correlation belonging to items in Visual Reading Strategies' scale has been given.

**Table4. The Scale of Visual Strategies**

ITEMS		Factor Rate	Cronbach Reliability Coefficient	Item Total Correlation Rate
2	Visualizing narrative texts with pictures develops students' comprehension. competence	,697	,919	,574
3	I think that effective readers can also visualize what they read.	,692	,919	,480
4	Implementing detailed examination helps comprehension over a story.	,665	,919	,476
6	Reading requires clearing up meanings of words before comprehension.	,616	,920	,419
7	It is important to set up relations in a meaningful text in reading teaching.	,758	,919	,559
8	If relations are made effectively in definition, I think that the text can be understood.	,693	,920	,390
9	Questions related to the pictures in the text enhance comprehension at the time of reading.	,527	,920	,482
10	Constructing indication in reader's mind (visualization) help them to comprehend their reading much more.	,684	,920	,452
11	Students need to interact with one another as a function of developing their own readings.	,515	,920	,410
12	Foreknowledge helping them set a connection with text is important in reading comprehension for readers.	,659	,919	,567
13	Foreknowledge containing visual image are important in reading comprehension for readers.	,679	,919	,563
15	Possessing reading visual objects like tableau, picture and chart etc. are important for student's both social and mathematical success.	,689	,919	,493
16	Tableau, picture, concept maps etc. are visual tools providing concretizing what is read, actualizing permanent learnings.	,729	,919	,519
17	Students' watching social affairs they run across with the aim of observation develop their visual reading abilities.	,557	,920	,436
18	Visual description related to reading passages cause to loss of time for students.	,700	,928	,344
19	Student's reading visual shapes develop only quantitative lessons' success.	,795	,925	,315
20	Students' visual reading abilities can be developed only in the second grade of primary school.	,816	,925	,390
21	Comprehending visual facts is an independent ability from reading comprehension competence.	,766	,926	,372
22	Concept maps and tableaus provide to submit information by summarizing for students to learn profoundly.	,515	,919	,481
25	I advise my students that reading is and comprehending a book is something like watching a film mentally.	,582	,917	,674
26	I and my students discuss the meanings of the words before reading.	,490	,919	,514
27	I read pictures in the book in order to create visual images about what the book says.	,648	,919	,540
28	I use "What do I know?" "What do I want to learn?" "What did I learn?" Strategies, while reading texts.	,715	,918	,581
29	How often do you make exemplification to create visual images over the story?	,705	,918	,590
30	How often do you ask questions in order to determine what is written in the story?	,765	,918	,650
31	I ask my students how they look at the story and how they get allotment from the story.	,696	,919	,547
33	I encourage my students to practice activities such as drama, play etc. so that it helps them to comprehend the story.	,610	,919	,542
34	I teach directly visual strategies to my students so as to develop creating visual images	,622	,918	,557

‘competences related to their readings.				
35	I individualize reading education by giving my students the opportunity of selecting their own books in their own readings.	,535	,919	,525
36	I want my students to visualize or create images after reading the story.	,570	,918	,604
37	I ask my students to guiding questions providing what they read to be more meaningful and comprehend more profoundly and helping them to create rich images.	,595	,918	,655
38	I want my students to guess the content of reading passage independently from pictures and tableaus.	,597	,919	,554
39	I provide my students to read a tableau, picture or shape in the passage they read associating them with it.	,630	,917	,696
40	I provide my students to visualize narrations in the text with a tableau or a simple pictorial shapes	,592	,918	,628
45	I provide my students to image the shape of an object in space or page.	,560	,918	,570
46	I provide my students to express the sense or opinions aimed to be given with Picture at the end of the reading passage.	,795	,919	,480
47	I want my students to narrate the parts of passage which they find interesting with picture.	,775	,920	,463
48	I want students to narrate what is told in the passage they read with a story map.	,813	,920	,431
49	I want my students to visualize what they understand related to descriptive text with concept maps.	,731	,920	,461
50	I give opportunity to the students for criticizing visual elements they have prepared about texts they read with their fellows.	,558	,919	,516

#### 4. Consequence and Proposals

In this study, the validity and reliability of Visual Reading Strategies Scale advanced by Epçaçan, Epçaçan and Ulaş have been determined.

The scale composed of 4 factors includes totally 40 items whose 19 items aim to determine “Participation Level” and 21 items “Accomplishment Level”. The first factor; being in the extent of “Contribution of Visual Strategies to Comprehension” is composed of 15 items. The second factor being in the extent of “Visuality Activities and Comprehension” is composed of 15 items. The third factor being in the extent of “Visualization of Reading Passages” is composed of 6 items. The fourth factor being in the extent of “Limitations of Visualization Strategies” encloses 4 items.

General cronbach alpha reliability coefficient of the scale composed of 40 items has been determined as 0.92. In the rate of factors, it has been detected that cronbach alpha reliability coefficient of the first factor is 0.91, the second factor’s cronbach alpha reliability coefficient is 0.92, the third factor’s cronbach alpha reliability coefficient is 0.93. The last form of the scale’s factor rate is above 0.30.

This scale could be used effectively, particularly in the first and second grade of the primary schools, at first in Turkish lessons, Life Information, Social Knowledge, Science and Technology lessons by providing students to comprehend the texts they read or reading passages. Class and branch teachers can make their lessons’ activities more colorful and effective by benefiting from the items in the scale. They can provide Visual Reading Strategies’ being carried out more effectively and abundantly in teaching. Moreover, teachers can make self-assessments about their own lessons in terms of using visualization activities by benefiting from this scale.

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