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IMPACT OF VISUAL AND VERBAL SCAFFOLDING ON WEB-BASED PROBLEM SOLUTION PERFORMANCE IN VOCATIONAL SCHOOL STUDENTS

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Abstract:
This study aims to determine the impact of differences in visual and verbal scaffolding on the performance of web-based problem solving. A quasi experiment was conducted on 140 high school students in class XII in Bekasi. The visualization tendency of each student was obtained at the beginning of the study. Based on visualization tendency scores, students are divided into two groups namely groups with low and high visualization tendencies. Each group is divided in half and randomly marked one to two lessons, namely visual scaffolding and verbal scaffolding. The eyes on the two lessons are the same. all student performance measured by a problem solving essay task at the end of the lesson. The results of the study showed that the visual scaffolding group outperformed the verbal scaffolding group (F = 22.54, P <.01). By not taking into account a significant degree of tendency. There was no significant impact of interaction between modalities scaffolding and trend level visualization of students. This finding implies that visual scaffolding is an effective strategy that influences the performance of problem solving.

Keywords: Verbal Scaffolding, Visual, SMK students

INTRODUCTION

Scaffolding is often used as a strategy to facilitate student learning and support students, especially in situations where learning based on scaffolding is often given in verbal and visual formats, previous research has shown that activities and visual material can improve student academic outcomes by affecting memory, understanding, and thinking skills students besides that, research recognizes the effectiveness of visual representations such as fl0w-charts, meaning in diagrams in problem solving. in addition web technologies are able to use more differences and dynamic representations of learning material in visual formats. the use of material in visual formats can be used in learning like scaffolding.

Visual scaffolding is a type of scaffolding that is given in the visual format visualization concept. Visual scaffolding can be given in visual objects such as diagramming or three-dimensional images or without words. In addition, the relationship between students' characterization of lavisual problems with learning outcomes and instructional support has been established. very visual and effective if given visual material and verbal students with verbal. in problem solving situations that are given, intellectual resources do not always include semantics that are logical but visual abilities naturally. A person with a high visualization tendency will use natural visual sources more often with someone with a low tendency for visualization.

When scaffolding is given in a visual format, it can be said that students with high visualization tendencies will benefit from higher scaffolding. When given in verbal format, the impact of scaffolding will be the same**.**

Participants of this study were 140 students of class XII vocational school, 68 male students out of 72 female students in two vocational schools in Bekasi. The reason for selecting the group is that class Xii vocational students already have sufficient personal control ability in solving web-based problems and have sufficient initial knowledge for rational social decision-making learning.

In this study students were given a pre-test, a visualization predisposition test of two types of web-based problem solving programs (visual and verbal scaffolding) and a ten-item pre-test post were developed to measure the level of initial knowledge of readiness to learn web-based problem solving programs from rational decision making. The visualization tendency test consists of 20 personal report items using 5 Likert scales and internal consistency, a cronbach .94. There are two types of web-based problem solving programs, namely visual and verbal scaffolding.

This study uses a completely randomized factorial design that is designed with two factors covering two variables (CRF 2.2). The independent variables choose different scaffolding modalities, visual and verbal scaffolding as interventions with a degree of visualization tendency. The research design is also shown as table 1

Table 1. Research Design

Group	**Pretes**	**Visualization trend test**	**Treatment**	**Postes**
G1	01	02	X1	03
G2	01	02	X1	03
G3	01	02	X2	03
G4	01	02	X2	03

RESULT AND DISCUSSION

The results of this study indicate that visual scaffolding has a major impact on student performance in web-based problem solving compared to verbal scaffolding. There are two reasons visual scaffolding is superior compared to verbal scaffolding. First, visual scaffold provides more information and helps memory students. Second, visual scaffold helps students understand overall problem solving tasks more comprehensively with less cognitive load. This is because visual scaffolding gives students a spatial representation of the structure or process of problem solving.

The level of visual tendency of students does not have a significant impact on the performance of students' problem solving. This may be caused by visual tendencies not related to visual or spatial abilities. Another possibility is that students with low visual tendencies have more advantages compared to high visual tendencies, as a result the impact similarly, visual scaffolding helps someone with a low tendency for visualization because someone with a low visualization tendency will be attracted to a pure semantic visualization compared to a high visualization tendency, visual scaffolding, provides extra visual information to students with low visualization tendencies to easily understand and process material easily.

Table 2.Comparison of scaffolding visua and Verbal.

		Visualization tendencies above 50 %	**Visualization tendencies, below 50 %**	**total**
Scaffolding visual	M	74.21	74.06	74.14
	SD	11.12	8.37	9.89
	case	38	32	70
Scaffolding verbal	M	65.61	66.94	66.30
	SD	8.54	10.30	9.45
	case	33	36	69
Total	M	70.21	70.29	70.25
	SD	10.83	10.03	10.41
	case	71	68	139

CONCLUSION

1. There is no significant interaction effect between the scaffolding modality and the level of student visualization tendency.
2. This finding implies that visual scaffolding is an effective strategy that influences the performance of problem solving.

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