# BALABOLKA Software to Improve the Ability to Access Electronic Learning Resources for Visual Impairment Students

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**Abstract**: This research was aimed to discover the use of Balabolka software in improving the ability to access electronic learning resources for visual impairment students who face the difficulties in accessing electronic learning resources. Assistive technology is needed to access these electronic learning resources. The quantitative approach to the Single Subject Research (SSR) method of A-B-A design was conveyed in order to collect the data. Based on the results, the baseline phase level 1 (A1) was obtained in RF subject of 54.60%. Mean intervention phase level (B) in RF subject was 75.64%. Mean baseline phase level 2 (A2) in RF subject by 81.9%. The findings showed that the use of Balabolka software to be helpful in supporting the ability to access electronic learning resources because Balabolka software offered audio functions to get information from computer devices.

**Keywords**: Balabolka Software, Electronic Learning Resources, Visual Impairment Students

## INTRODUCTION

Visual impairment is a condition of individuals who faces abnormalities or impaired function of the sense of vision (Sambira, 2018: 1). In general, people think that visual impairment is blind, but this is not the case because visually impairment can be classified into several categories. Some experts such as Djaja Rahardja and Sujarwanto (2010) define the visual impairment into three (3) categories, they are blind, functional blind and low vision With the obstacles of visual impairment students they face,these conditions require special services to meet their needs, including learning needs in school.

One of the students' need with visual impairments is the ability to access information, such as accessing electronic learning resources. According to AECT (1977) learning resource is as all sources (data, people, and goods) that can be used by students as a source or in combination to facilitate learning and include messages, people, materials, tools, techniques, and the environment. While according to Mulyasa (2010) learning resources are references, objects, and materials used for learning activities.

Learning resources can be divided into two categories, there are printed learning resources and electronic learning resources based on Information and Communication Technology (ICT). The use of ICT as a learning media can use computer devices as innovative learning media (Suci & Irfan, 2019: 50). The statement was reinforced by Munir (2009) arguing that the use of computers and computer networks provides an opportunity for every learning to access electronic learning materials presented in interactive activity through computer networks. The challenges faced by students with visual impairments in mastering actual computer devices will be easier to learn if the sense of sight can function. The students with

visual impairments use their sense of hearing and touch as the main tool to get information about the surroundings, including when they access the computers.

The students with visual impairments need auditive tools when accessing learning resources from computers. The audio aspect is an important aspect for students with visual impairments, so an assistive technology is needed that can process learning resources from computers into auditive learning resource information to improve their abilities. With thedevelopment of ICT , it is very possible to use a technology that can help the daily needs of individuals, especially students with visual impairments.

The audio media that can be used to access computers by students with visual impairments is  Job Access With Speech (JAWS). According to Sommerville (2003: 5) the software includes not only the program, but also all the documentation and configuration of the associated data, which is necessary to make the program operate correctly. How the JAWS screen reader application works is that the computer explains the display on the monitor screen with sound, starting from what menus are available, to inforing where the cursor is located on the computer (Tiolina,2019). However, there are shortcomings of JAWS. The original jaws version was quite expensive. Furthermore, JAWS software can only be accessed on a computer device or or notebook. Information that can be listened to at that time cannot be stored in audio format to be accessed in the future or accessed on media other than the computer. The dialect of jaws sounds mostly uses foreign language vocals, so it is not easy to understand what the software reads, especially for those who lack understanding of foreign languages.

Balabolka software is an assistive technology product that can be used as an audio media when operating a computer. Balabolka is a Text-To-Speech software (Titis, 2022:75). According to Pelton (1993: 93) the task of the Text To Speech system is to convert plain text into speech. In this case, the software converted all written text into an audio file and saved its written and audio (Amelia, 2017). Balabolka software is a freeware software, where the computer software is free to use without a time limit. Thus Balabolka software users can get it for free. Through the use of Balabolka software, it is hoped that students with visual impairments can be helped in accessing learning resources from computer electronic media easily, and practically.

**METHOD**

The researcher used a quantitative approach of experimental methods with a single subject or Single Subject Research (SSR). The SSR design used in this study is A-B-A. The procedure for implementing the A-B-A design in this study is to researchers determine the behavior to be changed as a behavioral target that can be observed and measured, in this study, namely the ability of students with visual impairments to access electronic learning resources.

The subject in this research were the RF subject of 7th grade students with visual impairments at SLBN in Kota Bandung, who capable of operating a computer and  JAWS programs. The instruments used in this study are the performance tests for student in accessing electronic learning resources before and after using Balabolka software. Validity Test through expert judgement (assessment carried out by experts or experts who are competent in their fields).

The data collection technique used in this research is the performance tests. The performance test aims to measure the improvement of students' initial abilities and after being treated using Balabolka software. The aspects measured are the ability to access and the speed of accessing electronic learning resources with Balabolka software. Writing a percentage is the number of correct answers from a test compared to the overall number of test questions then multiplied by 100%.

The data that has been processed is then analyzed to find out the extent of the level of stability of the development of the subject's ability which is often called trend stability, displayed in tables and graphs. The components that must be analyzed under conditions are (1) Condition length, (2) Directional tendency, (3) Level of stability (stability level), (4) Data trace, (5) Range, dan (6) Rate of change (level change). While the components of analysis between conditions include (1) Variables that are changed, (2) Changes in directional tendencies, (3) Changes in stability and effect, (4) Changes in data levels, and (5) Overlapping data (overlap).

**RESULT AND DISCUSSION**

**Result(S)**

Baseline 1 (A1) is the condition in which measurements of target behavior are carried out in a natural state before any intervention is given (Sunanto, et al.., 2006: 41). Baseline 1 (A1) aims to look at students initial ability to access learning resources from computer devices before being given intervention using Balabolka software. The activity is carried out by providing tests in the form of questions about accessing learning resources from computer electronic media through student worksheets given to students four times the test, which is done once every session.

Intervention (B) is the condition when an intervention has been given and the target behavior is measured under that condition (Sunanto, et al.., 2006: 41). Intervention activities are carried out by conducting learning activities using Balabolka software. Then the researcher conducts an evaluation at the time of learning. The evaluation is carried out at the end of the learning activity using the same student worksheet as the test during baseline phase 1 (A1).

Baseline 2 (A2) aims to look at the ability to access rf subjects' electronic learning resources after intervention. The activity carried out in the baseline phase 2 (A2) is to see the student's ability to access electronic learning resources such as during the baseline phase 1 (A1) by giving the same test as the test at baseline 1 (A1) and intervention (B).
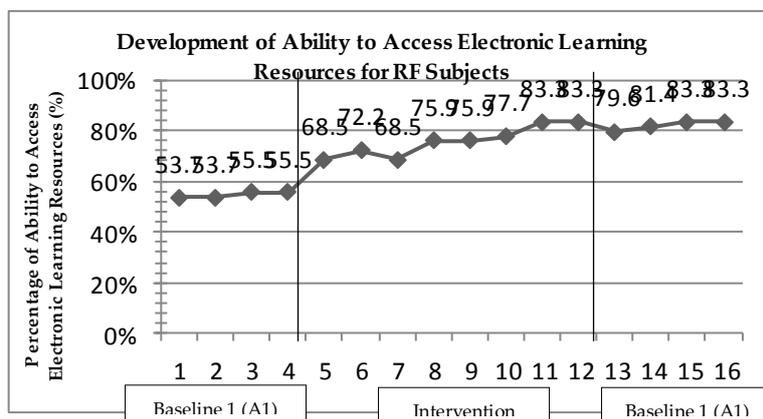


**Graphic 1 Development of Ability to Access Electronic Learning Resources for RF Subjects**
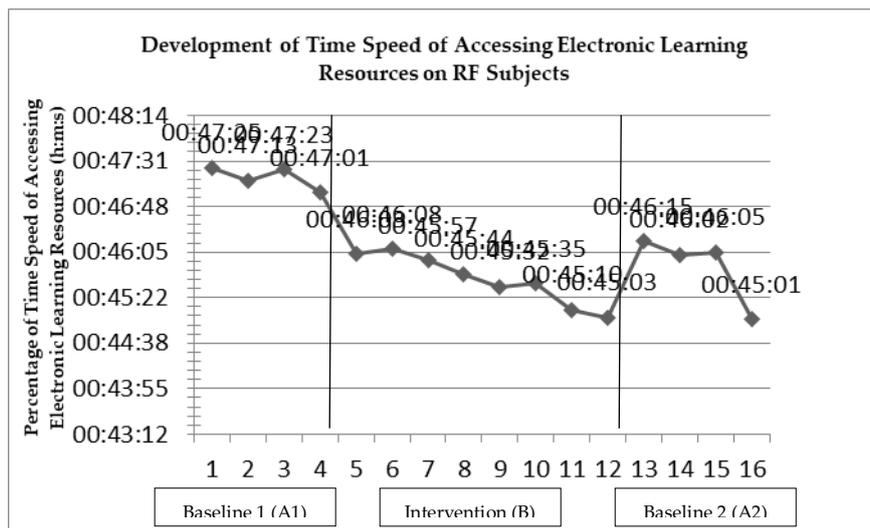
**Graphic 2 Development of Time Speed of Accessing Electronic Learning Resources on RF Subjects**

Analysis in conditions is the analysis of data changes in a condition e.g. baseline conditions or intervention conditions (Sunanto, 2006: 68). The following table showed visual analysis in RF subject conditions

**Table 1 Visual Analysis Results Under Conditions RF Subject**

| No | Condition | A1 | B | A2 |
|----|-----------|-----|-----|-----|
| 1 | Length of condition | 4 | 8 | 4 |
| 2 | Estimated directional tendency | (+) | (+) | (+) |
| 3 | Stability tendency | Stable | Variable | Stable |
| | | 100% | 50% | 100% |
| 4 | Data traces | (+) | (+) | (+) |
| 5 | Stability and range levels | Stable | Variable | Stable |
| | | 53,7%-55,5% | 72,2%-77,7% | 79,6%-83,3% |
| 6 | Level change | 55,5%-53,7% | 83,3%-68,5% | 83,3-79,6 |
| | | 1,8 | 14,8 | 3,7 |
| | | (-) | (+) | (-) |

Analysis between conditions is a change between conditions, for example from baseline conditions to intervention conditions. The following presented visual analysis between subject conditions

**Table 2 Summary of Visual Analysis Results Between Conditions Subject RF**

| No | Condition | B / A1 | A2 / B |
|----|-----------|--------|--------|
| 1 | Number of variables | 1 | 1 |
| 2 | Change in tendencies and their effects | (+)      (+) | (+)      (+) |
| 3 | Change in stability | Stable to Variable | Stable to Variable |
| 4 | Level change | 68,5%-55,5% = 13% (+) | 83,3%-83,3% = 0% (=) |
| 5 | Data overlap | 0% | 25% |

**Discussion(s)**

Some of the keyboard functions to access the tools in the operation of this Balabolka software can be seen in the Table 3.

Based on the results of data analysis, it can be showed that the improvements in the baseline phase 2 (A2) which has previously been given intervention using Balabolka software. The improvement in the ability to access electronic learning resources gave results of 27.3%. In addition, based on recording the speed of time obtained by students also increased. In the baseline phase 1 (A1) the first session with a time of 47 minutes 25 seconds and in the baseline phase 2 (A2) of the last session with a time of 45 minutes 1 second.

Comparison and development of mean levels in learners before and after the intervention using Balabolka software, It can be seen from the percentage of mean levels in the baseline phase 1 (A1) of 54.6%, intervention (B) of 75.64% and the baseline phase 2 (A2) of 81.9%. Mean levels from baseline phase 1 (A1) to baseline phase 2 (A2) before and after using Balabolka software increased by 27.3%.

Balabolka software is a Text To Speech (TTS) program, which is software that can convert text to voice form. All voices installed on the computer are supported by Balabolka software.

The advantages of Balabolka software are easy to learn for students with visual impairments. Another advantage of Balabolka software can convert various types of text formats into audio formats. Text operated in Balabolka software can use Indonesian vocal operated with Vocalizer Damayanti software. According to Joko, Abdul and Sunardi (2022:548) to change the English accent to Indonesian using Nuance Vocalizer Expressive TTS 5.4. To create the speech, the users can control the standard play-pause-stop buttons on the keyboard (McClellan, 2011). Balabolka and JAWS software can be said to have the same purpose of converting various texts into audio on computer devices. Previous research from Safaruddin, Yunus, and Efrina (2013) stated that JAWS can improve typing skills in visually impaired students where JAWS still uses audio in foreign languages. The features in Balabolka software are not owned by JAWS, making Balabolka software have advantages. This application is effective for improving students listening skills to understand the text of the procedure (Titis, 2022:77). In addition, Balabolka software is free software for a medium that focuses on the ability to listen so that it is in accordance with the characteristics of students with visual impairments who rely on the sense of hearing and touch. According to Yayuk (2016: 26) the emergence of listening media using Balabolka starts from this condition where teachers must provide decent and economical media to be made individually by the teacher himself.

**Table 3 Commands Through Keyboard Functions in Balabolka Software**

| **Ctrl+N** Function: open a new document | **Ctrl+Z** Function: command to restore to the previous state/ undo | **Ctrl+G** Function:: to replace number type text with word type | **F5** Fungsi: to repeat a previously read reading of the text | Ahift+Ctrl +F4 Fungsi: to output all open documents | **F2** Fungsi: to enlarge the appearance of letters (Can be used for students who are Low Vision) |
|---|---|---|---|---|---|
| **Ctrl+O** Function: open a new object/file | **Ctrl+F** Function: to search for a word specifically/find | **F3** Function: to search for the next word | **F6** Function: to pause pronunciation | **Ctrl+Alt+ Left** Function: to reduce the Rate value | **Shift+Ctrl+G** Function: to translate the language |
| **Ctrl+S** Function: saves the file in text format (*.bxt) and Balabolka documents (*.bxt) | **Ctrl+Alt+S** Function: saves a file with a different name | **Ctrl+W** Function: saves the file into audio form | **F7** Function: to dismiss pronunciation / stop | **F8** Function: to read highlighted text | **Ctrl+Alt+ Up** Function: to increase the Pitch value |
| **Ctrl+F8** Function: to split and convert text into audio formats | **Ctrl+R** Function: to replace specific letters/words /sentences thoroughly/replace | **Alt+F4** Function: to exit the software application | **F9** Function: to read out the text that is in the clipboard | **Ctrl+Up** Function: skip reading in the previous paragraph | **Ctrl+Alt+ Down** Function: to minimize the Pitch value |
| **Ctrl+Alt+ Right** Function: to increase the Rate value | **Ctrl+A** Function: to block the entire text | **Ctrl+Down** Function: passing readings in the next paragraph | **Ctrl+Alt+ PgDn** Function: to decrease the Volume value | **Ctrl+Alt+ PgUp** Function: to increase the Volume value | **F1** Function: to view help |

## CONCLUSSION

Based on the results, Balabolka software has been proven to improve the ability to access electronic learning resources for visual impairment student.

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