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# Interactive Media Development Using Microsoft Sway in Elementary Level Learning Circle

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**abstract**

Education process and technology go hand in hand and adapt to each other for teachers in carrying out their duties. The Microsoft sway application is the best choice for learning materials for students when carrying out distance learning (PJJ). By office 365 account, teachers can develop learning materials designed with existing Microsoft Sway features. There are titles, text, videos, images that are integrated directly with the internet network. Microsoft Sway is a website-based application that provides more interesting, interactive, online learning content and is integrated with the LMS (Learning Management System). The sway application design is designed with the Deck and Lou Carey development model. The development stage starts with planning, design, and development. The resulting validation shows a value of 95.55% on learning materials assessed by experts in the field of mathematics the media expert validation shows a value of 93.33% assessed by experts in Educational technology. Furthermore, student trials with a questionnaire model showed 84.59% very well in learning media, So the score obtained shows that the learning media using Microsoft Sway is feasible for students to use.

**Keywords:**
Learning media, Microsoft Sway, Circle

Open Access

## INTRODUCTION

The need for teaching material content in the world of education is currently needed to increase the learning power of students by using software-based application facilities in the learning process. Technological progress is support for teachers in taking advantage of educational situations that demand a change from conventional learning to digital (modern) based learning (Ika Handarini & Sri Wulandari, 2020). Education should be used as a strong basis for utilizing technology so that it can be used appropriately for teachers, especially as education implementers (Budiarto, 2020; Saputra & Gunawan, 2021).

The quality of students formed through education must be guaranteed by the teacher as a guide as well as a facilitator so that the output of teaching material products is following the content of the material to be achieved through improving the quality of learning. In addition, technological developments force the education component to be able to elaborate on the rapid development of science, information as an improvement in the quality of the learning process, so that teachers have the opportunity to take advantage of technology in lessons. (Gan et al., 2015; Jones, 2017). The importance of mathematics lessons that most students view is that mathematics is difficult to understand (Siregar, 2017). Mathematics is a lesson in the process of solving problems by counting in a coherent manner which is always related to the previous material (Lestiani & Kurniasih, 2016).

The development of technology can have a great influence on the world of education so interactive media with software have a good role in solving problems that exist in the world of education. Interactive multimedia elements consisting of text, video, audio, and animation as an attractive form so that they can be applied in learning activities (Nopriyanti & Sudira, 2015). (Sesariani et al., 2012) stated that student learning outcomes by presenting an internet network including e-learning were more improved compared to simple learning methods including conventional. Aids with learning media can improve the quality of teaching, increase interest in learning and digitize the form of delivery of learning materials (Han & Niu, 2019).

Utilization of LMS or e-learning by using an application called Microsoft Sway requires a more interesting and varied learning process to increase interest in learning and the process of student activities (Widiastuti & Wiyarno, 2019). Microsoft office that is connected to Sway is a product that uses the internet but its function is almost similar to the Microsoft PowerPoint application, the difference is that Microsoft Sway has features that are more attractive to readers (Merliana et al., 2021). Microsoft office 365, which is included in online office applications, one of which is Microsoft Sway, which has sophistication in the form of access to create learning media. (Ardian et al., 2020).

## LITERATURE REVIEW

One of the online learning media or applications with the application currently used by Sway that can be accessed from various devices such as mobile phones, tablets, notebooks when connected to the internet is Microsoft Sway 365. (Ika Handarini & Sri Wulandari, 2020; Wihartanti & Wibawa, 2017). Sway App is an application that helps users to create presentation slides using an internet connection by filling in teaching materials made from the Sway application which can be grouped as e-learning learning. (Zutiasari & Kuncahyono, 2021).

Supporting literature that learning needs to be developed by (Tunru & Putri, 2021) research related to the application of distance learning using the Microsoft sway in grade IV SD 006 Loa Janan Ilir resulted in increased student activity in distance learning and made it easier to understand the learning given to teachers. Implementation of

classroom learning by (Raharjo et al., 2020) by applying model-based learning with media sway can increase student motivation in thematic learning in grade 3 SD. Another research (Arzfi, 2021) In research on the development of literacy-based thematic teaching materials with Microsoft Sway, is very practical based on the results of the validation of learning experts and student responses to these teaching materials.

Based on the literature that has been analyzed from research studies on the development of Microsoft sway, stating excellent results in the implementation of learning, especially distance learning, then the development of learning media using the Microsoft Sway application is relevant to be used as a support for thematic learning in developing mathematics that discusses the circle element material for 6th-grade elementary school. The material presented with learning media using Microsoft Sway can provide a new atmosphere in understanding learning, especially the 6th-semester circular mathematics material by applying the 2013 curriculum.

## METHODS

### Population and Sample

The population studied in this development was the 6th-grade students of SDN Rangkah I Surabaya, amounting to 180 students using the research sample in class 6B which amounted to 36 students.

### Research Design

The research method used in Microsoft sway is Research and Development, namely the research method used to produce a product that has the feasibility and test the advantages of the product. (Sugiyono, 2016). The method used in product development is a model rather than a model (Alessi et al., 2001) in Thesis (Nurhairunnisah, 2017).

### FrameWork Flow

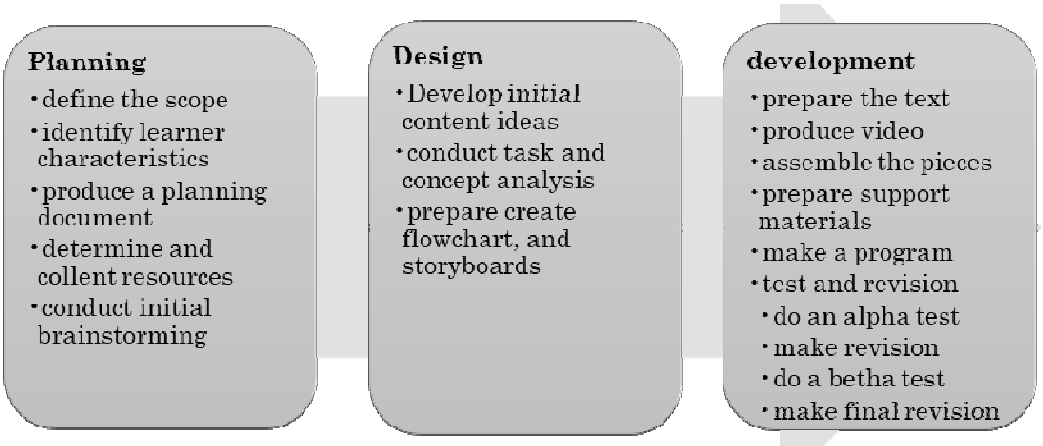


**Figure 1** Stages Development model (Alessi et al., 2001) in (Nurhairunnisah, 2017)

The following is a picture of the learning development model. The development model of (Alessi et al., 2001) In (Nurhairunnisah, 2017) describes three stages, namely planning, design, and development which are the references in producing effective products because the stages are brief and each stage is explained in detail.

### Research Design, Site, and Participants

The research was carried out through 3 stages to produce learning media development products. The research place is at the elementary school SDN Rangkah I Surabaya by implementing online learning through a WhatsApp group that provides learning

materials by sending a message in the form of a link with Microsoft sway. The participants who took part in the learning were class 6B, totaling 36 pupils.

From the 3 stages of the process from the expert (Alessi et al., 2001) in (Nurhairunnisah, 2017) that the implementation of the development stage was modified due to the existing situation and conditions. The research was conducted by collecting related data. Researchers conducted observations on continuous online learning activities in offline classes as well as interviews with class teachers who became student mentors, including activities utilizing learning media in the classroom. Furthermore, Material assessment is carried out by State University of Surabaya Lecturers with mathematics education expertise and media validation is carried out by the University of Surabaya Lecturers with Educational Technology as master of technology. Both validators are experts in their fields, so the assessments given are relevant to their background. and test the responses of 36 students in class VI.

**Data Collection and Analysis**

The data analysis technique used by the development research applies qualitative analysis techniques obtained from the validator and compiled as a reference for product revision to become a proper learning media. Teaching materials and media design have their respective instruments consisting of several aspects according to their respective criteria related to the development of learning media.

The results of the validator's assessment were measured using a questionnaire model. According to experts, questionnaire-based assessment is a way of collecting data through a series of questions from respondents to be answered (Sugiyono, 2013). Through a questionnaire consisting of very good – very poor categories which are described below 5 = Very Good (SB); 4 = Good(B) ; 3 = Enough(C) ; 2 = Less(K) ; 1 = Very Poor (SK). The purpose of giving a questionnaire in research on the development of learning media using Microsoft Sway is to get a value related to the feasibility of teaching materials on the aspects of the feasibility of the material and the feasibility of learning media.

The formula for calculating the mean score that can be obtained according to (Arikunto, 2010) in (Baidillah, 2018).

$$P = \frac{\sum x}{\sum x1} \times 100\%$$

P = eligibility percentage
$\sum x$ = total score of validator answers (correct answers)
$\sum x1$ = the total number of highest answer scores (Expected value)

The validity category of the assessment questionnaire data from the validator was then analyzed based on the assessment criteria table. Furthermore, to find out feedback from the development of learning media, it is necessary to test student responses by providing an assessment questionnaire and asking to fill in the value column objectively. The questionnaire assessment focuses on functional and design aspects (Setyadi, 2016) The results of tests and product trials will be grouped according to the criteria according to the percentage of results.

**Table 1** Eligibility Level Categories Based On The Average Percentage by (Arikunto, 2010) in (Baidillah, 2018)

| Percentage % | Validity level |
|---|---|
| 80-100 | Valid/Not Revised |
| 60-79 | Sufficiently Valid / not revised |

| | |
|---|---|
| 40-59 | Enough Valid / need revision |
| 20-39 | Less Valid/Partial Revision |
| 0-19 | Invalid/Revised |

## RESULT AND DISCUSSION

### Description of test result

The research was produced on a prototype designed in the form of an application of interactive thematic learning teaching materials that discusses mathematics subjects with circle material. The product of teaching materials has gone through several stages consisting of 3 stages including planning, design, and development.

### Planning stage

Placement of materials and achievements arranged in products that produce interactive teaching materials can be seen from the observations made by researchers and the interview process with teachers regarding the learning media used in the implementation of online/offline learning at SD Negeri Rangkah I Surabaya. Based on the summarized information, the use of learning media using Microsoft Sway is an assignment from the Surabaya City Education Office to facilitate online learning. Microsoft Sway used it very easily to include learning materials in every meeting. This is in line with (Ardian et al., 2020) Sway-assisted app to collect, format, and share our ideas, stories, and presentations on a great-looking interactive web-based screen.

This stage looks at the characteristics of learning media development based on theories, interviews, and observations from the SDN Rangkah I Surabaya environment. With the condition that Distance Learning is still ongoing with an online/offline scheme then we need an application to provide distance learning using Microsoft Sway. Application development is packaged in a website-based form to be easily accessible and presented with interesting learning material.

What is needed to create material using Microsoft Sway is the preparation of learning tools in the form of a syllabus, lesson plans, teacher and student books, evaluation grids, learning evaluations, and assessment documents for students. Preparation for having an office 365 account is obtained in several ways, such as getting it from the city/district education office, through training, or according to (Lestyanto, 2021) being able to create a Microsoft account (Hotmail, Live, or www.outlook.com).

A collection of supporting sources for interactive teaching materials in the form of Microsoft Sway software is presented relevant to the activities by the lesson plans. Starting from the syllabus identification process then making a Learning Implementation Plan (RPP) complete with attachments. The documents prepared regarding the material are: text sources: thematic books for grade 6 theme 4, LKS books, focus books by Erlangga for grade 6, internet sources. In addition, there are sources in the form of videos that are accessed for learning activities, namely prayer and the introduction of learning materials. After completing the required documents, media development is carried out using the office sway through the website www.office365.com.

The implementation of this stage is a collaboration with teachers regarding the discussion of the content of learning materials that will be carried out to develop learning materials using Microsoft Sway. In addition, training resources related to the features used in the application will be implemented to maximize learning media. The development process also consults with mentors as well as media and materials experts.

**Research Design Stage**

This stage is the process of developing ideas, analyzing concepts and tasks, making program descriptions, and using application features. The ideas developed are related to display, images, logos, written forms, animations, and video content. As well as the flow of providing mathematics learning materials by explaining mathematical knowledge about circles for class VI. The content presented is adjusted to the ability of grade VI children to easily capture the learning given.

Learning materials are arranged based on the lesson plans that have been prepared with circle material for grade 6 based on the learning objectives that have been formulated. Documents that have been prepared are used to support the evaluation of media and material validation.

The first research design is a flowchart that contains instructions for using learning media using a sway. Use of storyboard Contains front page categories, instructions for use, learning objectives, introduction to the material, the content of the material, description of the material, sample questions, discussion, evaluation of learning, and closing sentences.

**Development Strategy**

The stages of the process in this research include the development of material content on interactive learning media using Microsoft Sway which consists of text, images, animation, learning evaluation, video, and music. The learning activities provided are in the form of sub-materials which include the introduction of circles, the elements of a circle, calculating the circumference of a circle, and the area of a circle. Each has been listed in the available learning objectives.

The front page contains the title of the material presented about the circle material with the title “Build a Circle Room” to attract attention considering the image of a circle with a bustling color. The next page contains instructions for using Microsoft Sway properly for students to make learning easier through the application. And don't forget to give the

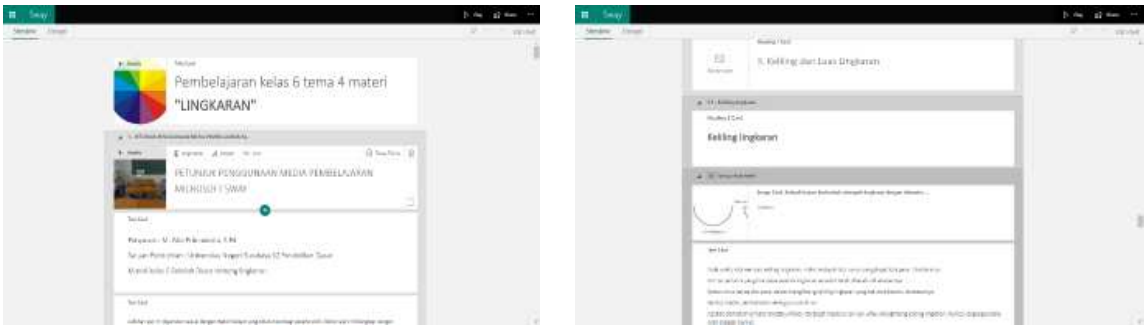


**Figure 2** Learning Media Design

apperception of the prayer video that was inserted at the opening of the learning activity. The description of the circular space material is presented with the title of text, text, images, videos, animations, and music presented in the core material. Giving the font model can be adjusted according to interest, automatically the size according to the sheet, and the image size can be adjusted. There is an introductory video that can be accessed integrated with YouTube with the title "knowing the circle" with a duration of 4 minutes. Each learning content is given a picture so that mathematics that discusses the shape of space can be understood by students who read.

The last part of sway learning is the evaluation of learning embedded in sway learning media, office 365 has unique features, one of which can be integrated with Microsoft forms which are also part of office 365. The evaluation of the flat shape learning material

consists of an identity section (name, absent number, class) and 20 multiple choice patterns from 4 answer choices (a, b, c, d). The learning evaluation given has a medium and high level of thinking.

Completed product development so that the product is ready to be tested. then the product validation stage by media experts and material experts is the most important thing to know the feasibility of learning media products using Microsoft sway.

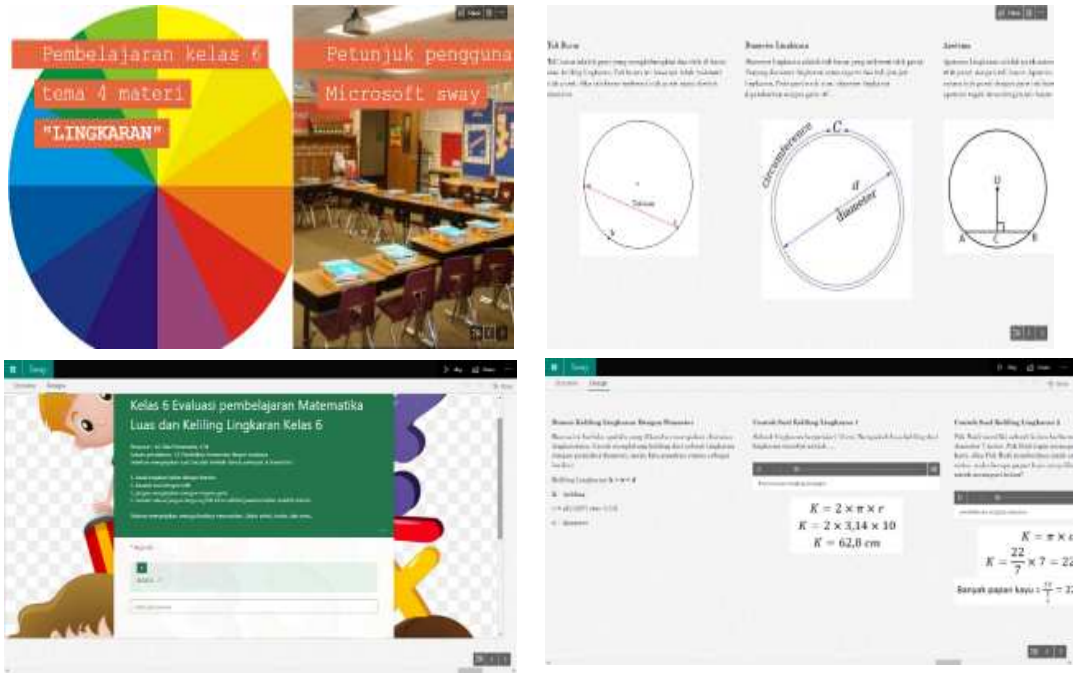


**Figure 1** Display Learning Media with Sway

**Material validation results**

**Table 2** Results of Material Expert Validation

| No | Aspect | Criteria | Acquisition score | Score criterion | Score percentage |
|---|---|---|---|---|---|
| 1. | Mathematics learning sub material | The material in the media is suitable for use for class VI | 5 | 5 | 100% |
| | | Systematic presentation of material | 5 | 5 | 100% |
| | | The depth of the material level of thinking | 4 | 5 | 80% |
| 2. | According to the curriculum | By basic competencies, learning objectives, learning indicators | 5 | 5 | 100% |
| 3. | Learning Evaluation | Learning valuation | 25 | 25 | 100% |
| | | The similarity of the learning evaluation answer key | 18 | 20 | 90% |

| | | | | | |
|---|---|---|---|---|---|
| | | Variations of questions in learning media | 18 | 20 | 90% |
| 4. | Language | The use of language includes: | 28 | 30 | 93,33% |
| | | Clarity of sentences | 14 | 15 | 93,33% |
| | | Total score | 122 | 130 | 93,84 % |

The validation of the learning media using the flat circle wobble material was validated by a Postgraduate mathematics lecturer. The first aspect of elementary mathematics learning material consists of: Understanding a circle, Elements of a circle, Finding the circumference of a circle, finding the area of a circle. The three criteria that cover these aspects are material in the media is suitable for use for class VI. The presentation of the material systematically, the depth of the material according to the level of thinking.

The second aspect regarding the suitability of the curriculum in the development of learning media refers to the 2013 curriculum at the elementary school (SD) level. Elements of learning media contain basic competencies, learning objectives, learning indicators that exist in the content of learning materials.

The third aspect related to the evaluation of learning there are 3 criteria, in the aspect of question clarity include: examples of discussion questions about the circle material, There is a discussion of the questions that have been presented, The text of the learning evaluation sentence is easy to understand by 6$^{th}$-grade elementary school students, Writing practice questions according to the correct Indonesian language rules, Each item of evaluation learning contains one correct answer with a multiple-choice pattern. On the criteria for the suitability of the answer key with the questions, discusses: The use of basic learning concepts, the use of formulas in solving questions, Contains the right answer key according to the question, each item has one unambiguous answer. The criteria for various types of questions in learning media include: Practice questions have more than one question, Practice questions are more than one type, Contains HOTS-based questions, there are illustrated questions.

The four aspects related to language have 2 criteria, firstly the use of language rules consisting of: Ease of using language by upper-grade students, Presenting general terms that become information for readers, Using language has meaning in motivating the process of learning activities, Letters and signs read the relevant sentence PUEBI rules (Pedoman UMUM Ejaan Bahasa Indonesia), Using informative language according to the insight of 6$^{th}$-grade elementary school students, Spelling accuracy is placed according to PUEBI (Pedoman UMUM Ejaan Bahasa Indonesia). Criteria for clarity of sentences have elements, Sentences delivered are communicative, sentences are arranged straightforwardly, Using simple sentences.

The results of the validation on learning materials show a value at a percentage of 93.84%. With this validation value, the learning materials using Microsoft Sway are included in the appropriate category for use. Comments from the validation of teaching materials answered that the teaching materials were suitable to be used as learning media. Several aspects that have been studied have resulted in a feasibility value on the validation of learning media development materials.

**Media validation results**

**Table 3** Media expert validation results

| No | Aspect | Criteria | Acquisition score | Score criterion | Score percentage |
|---|---|---|---|---|---|
| 1. | Media Display | Display suitability | 18 | 20 | 90% |

| | | | | |
|---|---|---|---|---|
| | includes: | | | |
| | Systematic presentation of material | 19 | 20 | 95% |
| | Text quality, | 23 | 25 | 92% |
| 2. Characteristics | Independent learning resources | 19 | 20 | 95% |
| | Interesting to play, include: | 18 | 20 | 90% |
| | The advantages of learning media include: | 14 | 15 | 93,33% |
| | Total number | 28 | 30 | 93,33% |

The validation of learning media using a flat circle was validated by a Lecturer of Educational Technology as a master of technology. The media display aspect has 3 criteria. The display criteria include: The main menu display (Heading) is good for students, The color combination in the learning media is suitable for sixth-grade elementary school students, The suitability of the background display attracts readers of media content, Attractive images, and animations. The criteria for the suitability of the selection of video and music media, among others: Providing educational YouTube content with clear sound, Playing interesting music for students, Selection of introductory learning video media that is concise, solid, and clear, Using videos and music that have features to play. Text quality criteria include: informative text well, the right typeface (font), font size that is proportional to the media, proper text color variations, proportional spacing between letters.

The second aspect concerns the characteristics of learning media. The criteria for the sources of teaching materials include: The implementation of learning activities can be done individually, There is completeness and convenience in learning media without the help of others, Information from teaching materials is equipped with instructions for using Microsoft media, Demonstrates equality of opportunity for 6$^{th}$-grade elementary school students to find out their abilities. The criteria for interesting learning media to play include; Making students finish reading on learning media, Students in groups can find a bibliography of material on learning media, Students individually or in groups can end the stages in learning media, Students carry out various features that exist in learning media to share and teach other friends. The criteria for the advantages of learning media include: Microsoft Sway has the essence of digital learning media that is current or contemporary at its time, Learning media can be a student's attention to learning, Learning media can make students concentrate on following the learning implementation process.

The results of the validity of the learning media obtained a percentage of 93.33% which indicates the value of the criteria is valid. Comments from the validation of teaching materials answered that the teaching materials were suitable to be used as learning media. Several aspects that have been studied have resulted in a feasibility value on the validation of learning media development materials.

**Table 4** The Results of Student Questionnaires On Learning Media

| No | Aspect | Criteria | Number of respondents | Skala | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | SB | B | C | CB | KB |
| 1. | Ease of understanding learning material | Microsoft Sway learning media makes it easier to carry out learning | 36 | 30 | 5 | 1 | 0 | 0 |
| | | The material can be understood easily | 36 | 31 | 5 | 0 | 0 | 0 |
| | | Learning with Microsoft sway can understand circle material | 36 | 32 | 4 | 0 | 0 | 0 |
| 2. | Independent learning | This learning media can be used without the help of other friends | 36 | 27 | 6 | 3 | 0 | 0 |
| 3. | Interest in learning media | Students are interested in learning mathematics with Microsoft sway | 36 | 33 | 3 | 0 | 0 | 0 |
| | | Learning with Microsoft sway is so much fun | 36 | 32 | 3 | 1 | 0 | 0 |
| | | Microsoft Media has animation, music, video features that can be played | 36 | 30 | 4 | 2 | 0 | 0 |
| 6. | Microsoft sway display presentation | The text in the media looks clear and easy to read | 36 | 31 | 5 | 0 | 0 | 0 |
| | | Images and animation | 36 | 28 | 7 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | displays are visible | | | | | | |
| 7. | Learning activity | Microsoft sway responds to themselves to actively ask questions, discuss circle material | 36 | 30 | 6 | 0 | 0 | 0 |
| | | Students are interested in working on learning evaluations embedded in Microsoft Sway | 36 | 31 | 5 | 0 | 0 | 0 |
| | | Number of results | 396 | 335 | 53 | 8 | 0 | 0 |
| | | Total percentage | 100% | 84,59% | 13,38% | 2% | 0% | 0% |

The results of the trial of class VI B SD students totaling 36 students showed the percentage with very good results (SB) 84.59%, Good (B) 13.38%, Enough (C) 2%, Fairly good (CB) 0%, Not good (KB) 0%. From the questionnaire data on student responses to the use of Microsoft Sway learning media. The value of respondents with the percentage of qualifications shows a value of 84.59% or the same as the valid/unrevised criteria. Research conducted (Merliana et al., 2021) stated that 60% of students who were given a questionnaire answered that they were very satisfied with the use of Microsoft Office Sway. Other research that supports (Larasati, 2021) Microsoft Sway media has effectiveness on the evaluation model of High Order Thinking Skill learning in Online Learning in the Era of Society 5.0.

## CONCLUSION AND IMPLICATION

### Conclusion

Based on the results of research conducted by researchers related to the development of learning media using Microsoft Sway, it has been by the period of distance learning activities which is still used in schools. Through this application, it can also make it easier for teachers to provide online learning, of course, by utilizing existing features. Microsoft Sway can be an alternative for students to access learning easily and for free. Microsoft sway can also be integrated with other applications such as Microsoft forms, youtube videos, bing search website images, and so on. This advantage is a very good thing to provide interesting learning for students.

Elements assessed in this learning media include material and learning media. From the validation of the data above, the sway-based learning media is valid on the learning materials contained and the learning media that have been assessed through the specified criteria. 4 aspects contained in the learning materials provide valid categories for students in the content of learning media and 2 aspects related to learning media provide results with valid categories in the feasibility of making learning media on circular material. Tests on students on the use of learning media showed 7 aspects of student responses to get good results with valid categories.

## Implication

The implications of the research that has been carried out are carving out good results on learning media for validators and the impact of students when using Microsoft Sway media. The score on the assessment of learning materials is 95.55% with valid criteria and 93.33% learning media with valid criteria. In the category of the feasibility of material content and elements of learning media using a sway, it is feasible to be used as learning material for students. In a trial with student responses, it resulted in a very good criterion value of 84.59% which was in the valid / not revised category.

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