Android Application *Appy pie* to support Students Writing Stories Skill Through Flipped Classroom Learning Models

Heny Kusuma Widyaningrum [a,*], Cerianing Putri Pratiwi [a], Agung Duta Menggala [a], Cahyo Hasanudin [b], Ayu Fitrianingsih [d]

[a] Department of Primary Education, Universitas PGRI Madiun, Setia Budi Street, Madiun, 63117, Indonesia
[b] Department of Indonesia Language and Literature Education, IKIP PGRI Bojonegoro, Bojonegoro, 62114, Indonesia
[c] Department English Education IKIP PGRI Bojonegoro, Bojonegoro, 62114, Indonesia
Corresponding author: *heny@unipma.ac.id

Abstract—Nowadays, millennials are required to be more active and interested in information and technology. Similarly, in the learning process, it is also recommended to use technology actively. One of the technology-based learning media is *appy pie*. *Appy pie* is one of the online application builders available on the internet. This research aims to develop an android application called *Appy pie* to support students' writing stories skills through flipped classroom learning models and to know the responses of teachers and students when using the application. This type of research is Research and Development (R&D) using ADDIE design, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The participants were 20 students in the fifth grade of elementary school. Based on the results of the research, it is found that the development of *appy pie* to support students' writing stories through flipped classroom learning model is assessed by three material and media practitioners to know the practicality of the product. The assessment results show that the average value of media practitioners is 95, and the average value of material practitioners is 84.67. The results show that the media is very feasible and effective to be used. The average student response to the assessment is 90.25, and the teacher response to the assessment is 96 with excellent criteria. Future research, application of pie media can be applied to all learning materials.

Keywords—*Appy pie* teaching media, writing skill, flipped classroom.

I. INTRODUCTION

Science development has changed the learning process to student-centered learning. It makes the teachers' role is not only as an informant but also as a facilitator in developing students' knowledge. It creates an active millennial generation that is able to use information technology [1]. The educators utilize technology to develop students' knowledge and improve their competencies. This is a form of digital literacy [2] because technology is crucial in learning [3].

One way to improve students' competency is by using a teaching innovation called the flipped classroom. It overrides traditional direct instruction and emphasizes implementing students' knowledge [4] under knowledge requirements in society [5]. The flipped classroom was an excellent way to reduce time in classroom learning by maximizing communication with some people, such as teachers, students, and the people around them [6]. The flipped classroom was

influential in gaining information and knowledge [7], [8]. It used teaching media that could be accessed directly by students [6], [7].

In the flipped classroom, the materials are usually in the form of videos given online first, followed by a face-to-face meeting to discuss the materials studied before. It makes the classroom activities more focused on students' actions than delivering material [9]. The teachers' role in the flipped classroom was as a facilitator, which positively impacted students. Research results by Julia *et al.* show that teaching and learning activities that use the flipped classroom model have an essential position in implementing education [10]. The results of Al-zoubi and Sulaeiman's research stated that flipped classrooms with e-learning based on critical thinking skills increased female student participation [11]. Girmen and Kaya's research results mention applying the flipped classroom learning model by enriching digital story and game-based activities teaching-learning processes in Turkish

courses [12]. From this description, it can be said that flipped classrooms cannot be separated from e-learning [13]. However, the implementation of the flipped classroom can use some variations [14]. The performance is not only done online but can also be done offline. From the results of previous research, the researcher wants to apply the flipped classroom learning model in teaching to write stories.

One of science and technology developments is computer development that becomes more increased in this era [15]. Mobile learning is a suitable device for millennials who are aware of digital information. A study by Hasanuddin *et al.* [4] reveals that the flipped classroom learning using Cyberlink PowerDirector apps is best implemented to teach millennial students.

In the education field, elementary school students gain knowledge from several subjects; one of them is the Indonesian language. It also studies writing ability. Writing is a compulsory subject for students because it is really important in their life[16], [17]. If they master writing ability, they will master various ability in another fields. In classroom learning, the main function of writing is used by students to learn and think logically [18], [19]. The creative thinking are always needed in many fields, especially in solving the problems given by teacher/lecturer [20]. Through writing, students are able to give ideas and express it in a good writing. The aesthetic, informative, and persuasive souls will be embedded in themselves [21], [22]. Knowledge has a role in the formation of behavior [23]. In this way, a teacher must be a good model and be positive in teaching students in the classroom. Therefore, suitable strategies are needed by students in writing stories. The messages implied in writing can be understood through reading [24]. Therefore, it is necessary to read properly to write well.

Many students still have difficulties in writing a story, such as (1) difficulty in expressing ideas and thoughts, (2) difficulty in developing ideas, (3) fear of arranging stories into correct grammar [25], [26]. In this modern era, almost everyone uses Android to communicate, work, find information, etc. One of the most popular teaching media today is Android-based learning media. Android is a Linux-based operating system designed for touch screen mobile devices such as smartphones and tablet computers [27], [28]. The operating system of smartphone adjusts from low-end to high-end specifications, so the development of the android system is sharply increased [1], [29], [30].

The result of the research was done by Abbas et.al; showed that the application which is developed by using Jquery-mobile library can runs in Android Operating System [31]. The research had done by Kusuma et.al explained that android users could install game by using RPG maker MV [32]. It was done by 76,2% android users [33]. The three results of these studies make a reference for researchers to do new things, namely the use of *Appy pie* application. The three researchers above have not used the *Appy pie* concept in their studies. From this point, the researchers apply the concept of utilizing Android-based media i.e., the *Appy pie* application. In this study, the researchers want to develop learning media that can be used on the Android platform namely the *Appy pie* application.

The interactive Android-based learning media is *Appy pie*. It is one of the online app builders available on the internet. It is oriented on smartphones with Android, Blackberry, Microsoft/Windows, and Amazon operating systems [34]. The application which is built through *Appy pie* can be used personally and published through Google. [27], [35]. Based on the explanation above, *Appy pie* can be used as a learning media that helps students especially in writing stories. It can also be found that mobile devices influence human-computer interaction, facilitate collaboration and communication, increase student' participation in the learning process, stimulate motivation, and improve student' academic interaction [36].

The development of *Appy pie* application in flipped classroom is an effort to create e-learning tool that supports flipped classroom and fulfills the learning needs. *Appy pie* application is very suitable for millennial students who are active in flipped classroom learning. Based on background of study, the researchers want to know how to develop *Appy pie* application in writing stories skill.

II. MATERIALS AND METHODS

A. Type of Development Research

The type of this study is Research and Development (R&D), by developing android-based learning media through Appy pie software. The development model used in this study is ADDIE. It consists of five stages, including Analysis, Design, Development, Implementation, dan Evaluating [37]. The responses were coded using the five primary steps of the ADDIE instructional development model.
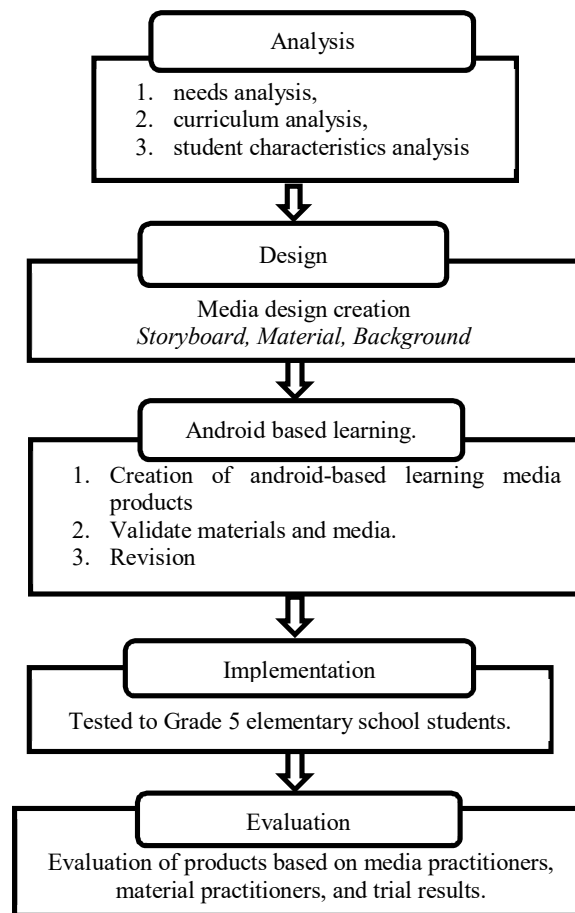

Fig. 1 The development stage of the ADDIE model [38].

The description of the method of developing Android-based learning media models for the ADDIE approach is as follows. First, the analysis phase is carried out by researchers to be used as a reference in designing and developing products. These stages include the analysis of needs, curriculum, and characteristics of students. Needs analysis is done through interviews with teachers related to features that need to be included in learning media that are expected to attract students' attention. Curriculum analysis aims to examine the curriculum. Character analysis of students was conducted to determine student characteristics related to cognitive abilities by the period of thought development. Second, the design stage is used to design learning activities, starting from designing new concepts on paper, developing new products, and designing instructions for applying the design. Third, the development stage is the realization of product design. Fourth, the implementation phase is the activity of testing the product for students. Fifth, the evaluation stage includes evaluating the product based on the calculation of values given by media practitioners and material practitioners.

B. The Assessment Instrument

Validation of the feasibility of this product was tested by teachers and students. The instruments are explained in the following table.

TABLE I
THE ASSESSMENT INSTRUMENTS FOR TEACHER RESPONSE

Criteria Aspects	Indicators	Instruments number	Total
Presentation of sub-theme material of ecosystem balance in the first meeting	Material is appropriate with the students' ability to learn it	1,2,3,4,5	5
Conformity of Curriculum 2013	Material is in accordance with Basic Competence and Indicators	6,7,8	3
Learning Evaluation	Evaluation to measure student's understanding	9,10,11,12	4
Carried out	Easy to be used	13,14,15	3
Linguistics	Clear and Easy to be understood [39]	16,17,18,19,20	5

TABLE II
THE ASSESSMENT INSTRUMENTS FOR STUDENTS RESPONSES

Criteria Aspects	Indicators	Instruments number	Total
Easy to be understood	Learning easily	1,2,3	3
Be autonomous	Using media independently	4,5,6	3
Be active	Being active in learning	7,8,9,10	4
Interest in android-based learning media	Developing logical thinking	11,12,13,14,15	5
Present the android-based learning media	The texts are easy to be understood and interesting [39]	16,17,18,19,20	5

The results of data obtained from the questionnaire of students and teacher responses are processed by using the following formula [40].

$$\bar{X} = \frac{\sum x}{N} \qquad (1)$$

From these formulas, the classification of total valuation can be obtained with the following criteria [41].

TABLE III
CLASSIFICATION OF TOTAL ASSESSMENTS

Formula	Classification
$X > \bar{X_1} + 1,8 \times sb_i$	Very decent
$\bar{X_1} + 0,6 \times sb_i < X \le \bar{X_1} + 1,8 \times sb_i$	Decent
$\bar{X_1} - 0,6 \times sb_i < X \le \bar{X_1} + 0,6 \times sb_i$	pretty
$\bar{X_1} - 1,8 \times sb_i < X \le \bar{X_1} + 0,6 \times sb_i$	Not worth it
$X \le \bar{X_1} - 1,8 \times sb_i$	very inadequate

TABLE IV
GRID OF ASSESSMENT INSTRUMENTS FOR MATERIAL PRACTITIONERS

Aspect Criteria	Indicator
Presentation of material about the sub-ecosystem balance in learning one	The material by the absorption of students
Conformity of 2013 Curriculum	Material by basic competencies and indicators
Learning Evaluation	Evaluation to measure student understanding
Implementation	Ease of use
Linguistic	Easy and clear

TABLE V
GRID OF ASSESSMENT INSTRUMENTS FOR MEDIA PRACTITIONERS

Aspect Criteria	Indicator
Media display	Attract the attention of students
Video	Video quality
Text	Appropriate sentence selection
Ease	Easy to be operated

III. RESULTS AND DISCUSSION

A. Product Development Result

The development of this application used *Appy pie* software. It had the advantage to make an Android application without coding. The results of the interview with the media user showed that the features of *Appy pie* included instructions, materials, videos, quizzes, music, and students' book. The learning media was developed by using the android system. It was not more than 50 Megabytes, so that makes it easily distributed. The application was distributed via data cable, Bluetooth, or Google Drive. It could be installed directly and downloaded via Blogspot.

The Design Stage was carried out, referred to as the result of the analysis. In this stage, the researcher created a learning media design that was done through a storyboard and flowchart. The following is a flowchart of developed media:
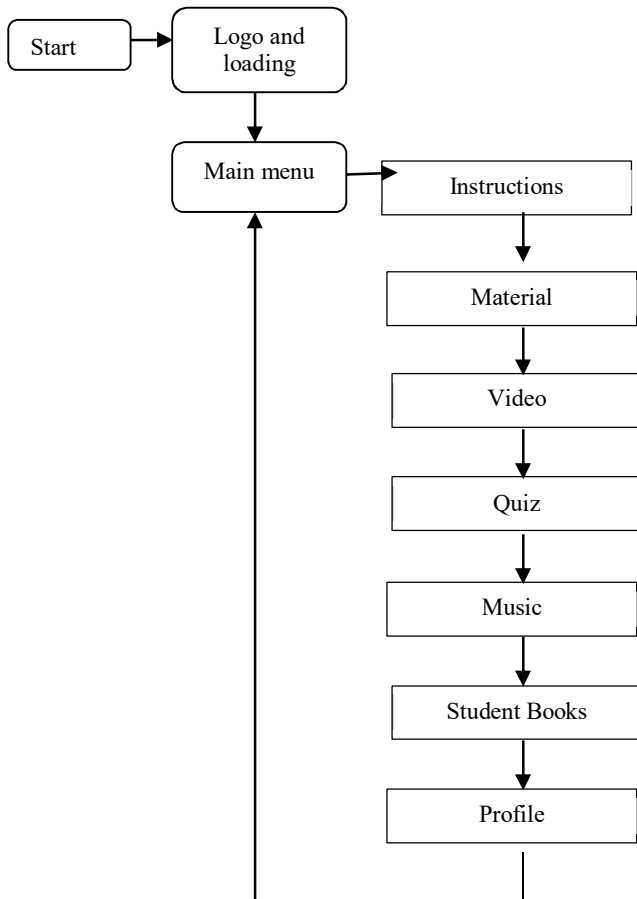
Fig. 2 Flowchart of the main menu (Home)

The development stage was carried out after analyzing and collecting information. This stage developed the design product of android-based media using *Appy pie* application software or website www.appypie.com. Android-based mobile learning application was developed appropriately for the basic competence in elementary school. The application was supported by videos, pictures, and music. To find out students' understanding, the concepts were presented in some sub-menus that chose including the initial display, instructions, materials, videos, quizzes, music, student books, and developer profiles. The following pictures were the product of the developer results.
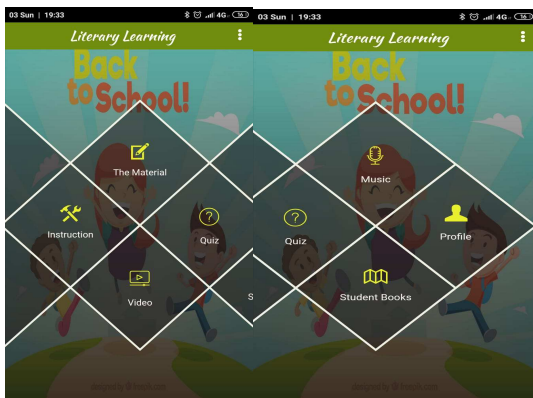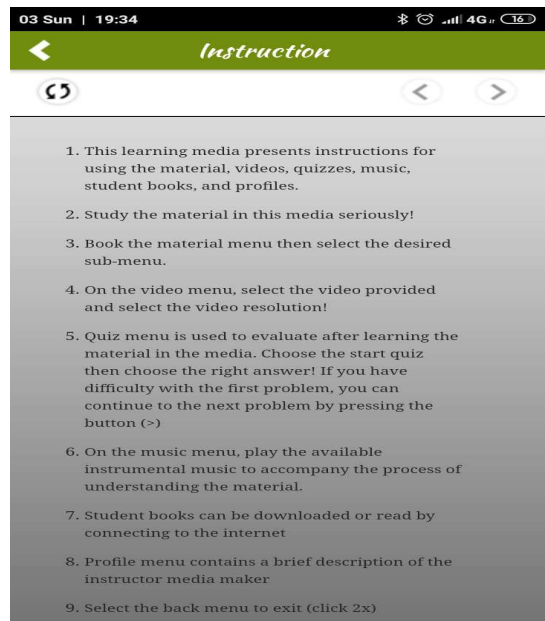

Fig. 3 The display of the main menu

Fig. 4 Instructions display
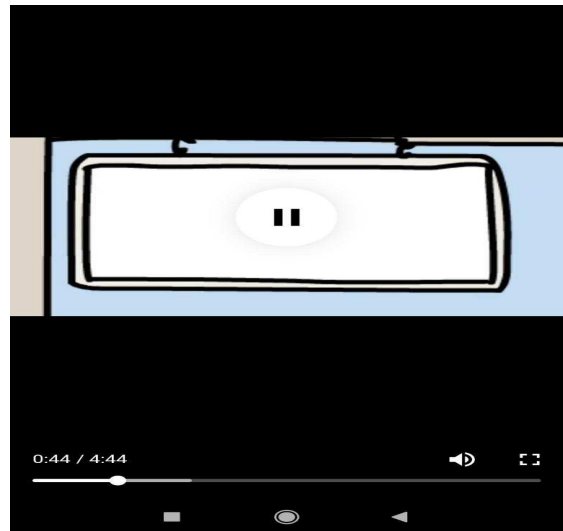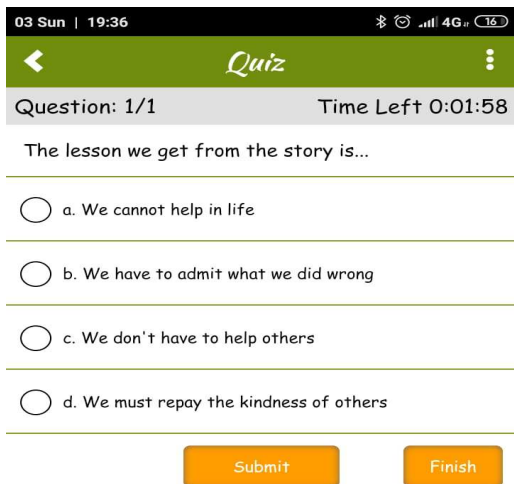

Fig. 5 Material display

Fig. 6 Video display

533

Fig. 7 Quiz display
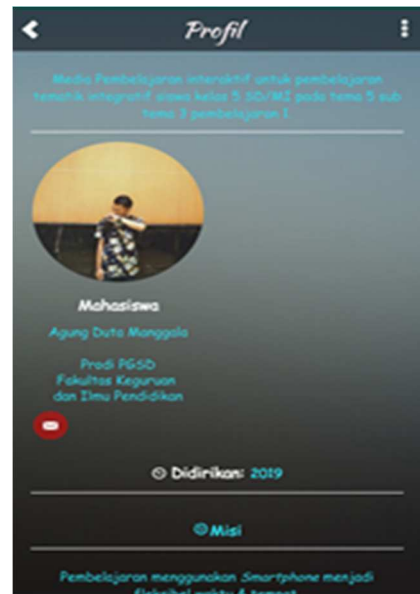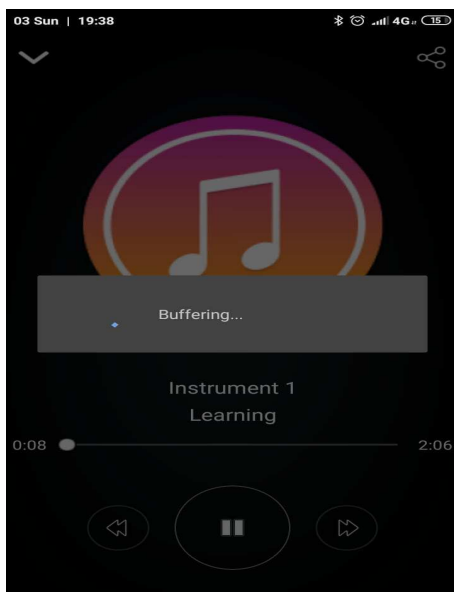

Fig. 10 Profile

Fig. 8 Music display

The Instructions feature contained the procedures of using media. The material feature contained PDF materials that could be downloaded or opened online. Video feature contained advanced material in the form of animated videos with MP4 format, which were uploaded on the developer's YouTube account. The quiz feature contained questions in the form of multiple choices; at the end of the questions, the score would appear. The music feature contained songs that were adjusted to the student's ages. The feature of students' book contained a digital book for the learning process. At last, the profile feature contained the developed media and the profile of the media developer. These features really supported the implementation of the flipped classroom. The flipped classroom model required technology in the form of networks, applications, and videos [42].

In the implementation stage, the researcher also distributed the questionnaires of student responses. It aimed to measure the practicality of product viewed from the suitability aspect of learning media as students learning sources. The aspects that were assessed using this questionnaire included being easy to be understood, being autonomous, being active in learning, being interested in Android-based learning media, and presenting it as the product user. This questionnaire was given to 20 students who took part in mobile learning[1]. Mobile learning was one of educational technologies that could be developed in educational and cultural environments [43]. Mobile learning belonged to a type of electronic learning that was implemented through cellular technology such as personal digital assistant (PDA), cell phones, audio player, e-books, etc.

This questionnaire was also distributed to the teachers to find out the responses of the learning media facilitator. Based on the analysis of the first questionnaire, the assessment result showed an average value of 90.25 with very-good criteria. In line with this, the analysis of the second questionnaire gave the assessment result that showed an average value of 96 with the same criteria. More details on the results of teachers and students' questionnaires can be seen in the following table.

Fig. 9 Student books

Rated aspect	Score
Material on suitable media is used for fifth- grade students	5
The material explained systematically	4
The material compatibility with local potential around schools and regions	5
Material on the media is easy to learn	5
The material is presented according to the student's thinking flow	5
Material in accordance with basic competencies	5
Material in accordance with learning objectives	5
The contents of the material are interrelated between subjects	5
The questions are in accordance with the indicators and material in the media	4
Evaluation questions are appropriate for measuring student understanding	5
Evaluation of the media makes it easy to understand the material	4
Evaluate according to the level of material difficulty	5
Material is taken from problems that are commonly found in the community	5
The solution to the problem is obtained through a combination of previously acquired knowledge and experience in the community	5
Bring up analytical skills	5
The language used does not cause multiple meanings	5
The language used is easy to understand	5
The language used is in accordance with a standard vocabulary	5
The spelling is correct	5
The language used is communicative	4
Amount of values	96
Criteria	Very good
Average Value	96
Criteria	Very Good

TABLE VII
DATA RESULTS OF TEACHER RESPONSE QUESTIONNAIRE ANALYSIS DATA
RESULTS ANALYSIS OF STUDENT RESPONSE QUESTIONNAIRE

Initial Name	Score	Criteria
FSN	82	Good
HRP	81	Good
RRJ	82	Good
AA	91	Very good
AHM	92	Very good
BDR	89	Very good
DAA	100	Very good
FAR	92	Very good
GYP	91	Very good
GFS	86	Very good
HK	92	Very good
LCK	93	Very good
NRS	80	Good
NAF	95	Very good
PP	80	Good
RGL	93	Very good
RI	94	Very good
Ria	95	Very good
SRI	93	Very good
MNJ	93	Very good
Average Score	90,25	Very good

It could be said that the development of android-based learning media through *Appy pie* software was very practical to be used in writing stories. *Appy pie* software is implemented due the best feature in developing smartphone applications [44]. This application could be accessed via the Android platform, Mac OS, Windows Phone, Blackberry, and HTML 5.

Products that have been developed are validated by media practitioners and material practitioners. Media validation was carried out by three lecturers. This validation aims to obtain assessments, inputs, responses, and suggestions relating to the product being developed. There are four aspects, namely media display, video, text, and convenience, which are broken down into 20 statements. The total score of the P1, P2, and P3 assessment results is 94, 96, 95, with very decent criteria. The average value of the three validators is 95. The overall value of the validation results can be seen in the following figure.
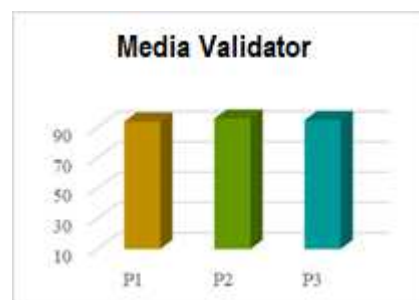

Fig. 11 Diagram of media validation results

Information:
P1 = First Practitioner
P2 = Second Practitioner
P3 = Third Practitioner

The results of input from the media practitioner validator become a reference in product improvement. The improvements made as follows: before the background revision, it interrupts the appearance of the icon because the icons have the same layer color, so the text is not visible. After the revision, the background is replaced with brighter color, the keyboard is given a color layer, and the icon is replaced with a contrasting color so the text can be seen. Quiz display before revision, the type of font used is Times New Roman, which is a little bit harder to read by the elementary students. After revising, the font type in the quiz display is using Comic Sans MS because it is appropriate for the student. The appearance of the instructions before the revision of the procedure for using the media is unclear and not coherent, and the background disturbs the readability of the text. After the revision of the procedures for instructions, the media were given additional sentences to make it coherent and clear, and the background was changed adjusted to the font color, so the text is easy to be read.

Material validation was carried out by three practitioners of the material. There are five aspects, namely the suitability of the material, the suitability of the 2013 curriculum, learning evaluation, feasibility, and linguistics which are broken down into 20 statements. The total score of the assessment results obtained from P1 is 73 with reasonable criteria, P2 is 95 with very feasible criteria, and P3 is 86 with very feasible criteria. Total Average of 84.67, including very decent criteria. The

overall value of the validation results can be seen in the following figure.
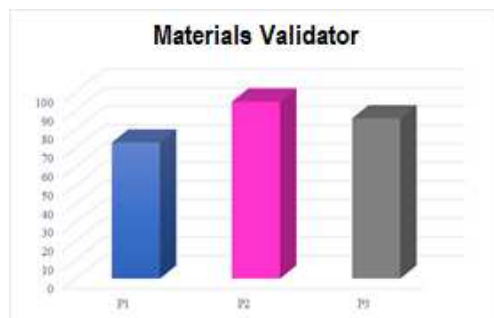

Fig. 12 Diagram of material validation results

Information:
P1 = First Practitioner
P2 = Second Practitioner
P3 = Third Practitioner

The results of the data validation of learning media through *Appy pie* software were declared to be very appropriate to be used as a support for learning to write fairy tales in elementary school. The assessment of material practitioners was carried out, referring to aspects of the presentation of the material, curriculum suitability, learning evaluation, performance, and language. The results obtained mean value was 84.67 and declared as very feasible. The assessment was obtained from three practitioners who provided an assessment as well as input regarding the material included in the Android-based learning media developed.

Fairytale writing material displayed in *Appy pie* media received good responses from practitioners of the material. The material was stated as very appropriate is closely related to the media when it is received by students. Practitioners of the material give responses that good and interactive learning media can make students interested in learning seriously [45], [46]. The media will be able to produce good story writing from students.

Evaluation of media practitioners includes aspects of media appearance, video, text, and convenience. The average value of 95 was stated as very feasible. The assessment was obtained from three practitioners who provided assessments and input on the Android-based learning media developed.

The results of the media feasibility of these media practitioners prove that *Appy pie* is an interactive learning media that can help the process of delivering learning material [35]. Mobile learning is said to be interactive because in it, various media can be combined, including text, audio, visual, video and others [47].

All eligibility and practicality criteria are calculated based on classification; if the average score is> 83.999, then it is classified as very feasible. Based on the results of the validation of media and material practitioners, the development of interactive learning media based on Android through the *Appy pie* software is very feasible and very practical to be used by students in elementary school.

Based on the discussion above, it is known that this research has advantages over previous research; this is seen from the learning method. In terms of learning methods, it is known that learning is based on android, which is applied in learning to write fairy tales. Mobile learning functions as a support for learning [27], [46]; the material contained in the

media is programmed to complement the learning material obtained by students to strengthen mastery of the material by students. Mobile learning media can make it easier for teachers to deliver learning; besides that, the learning provided can be obtained by students anywhere and anytime so that students can also practice for independent learning [48].

Making an application using *Appy pie* is quite easy for teachers to do because it does not require special skills in computer programming. It is enough with the availability of an internet network and a computer or laptop; applications can be made easily. This is because *Appy pie* has provided a template for making the application so that the teacher only needs to enter the material to be conveyed, which can be text, images, or videos.

The process of developing a mobile learning media application design *Appy pie* android utilizes a website that provides online application creation services which will make it easier to create applications without requiring coding, namely appypie.com which supports use on android smartphone devices, android is an open operating system that makes it easier to modify [49].

The research and development process of mobile learning media products that utilize the appypie.com and android websites still has several obstacles. The limitations of the services provided by the website are one of the obstacles that result in the content or design that the researcher wants is not fully available and can be applied to the application being developed. These limitations include not being supported for adding animation to the application and not being able to zoom. Even though there are still obstacles, this does not change or reduce the content contained in the application in accordance with the applicable curriculum and regulations. Apart from the existing obstacles, the *Appy pie* android mobile learning media has great potential in the world of education. Judging from the manufacturing process that does not require expertise in coding and does not require many applications to use but just one website. This will make it very easy for developers who will create learning applications.

IV. CONCLUSIONS

Developing android based learning media is carried out by utilizing appypie.com. According to the experts of media and materials, the developed media is very appropriate and effective to be used in teaching story writing to the fifth-grade students at primary school. The students and teacher provide very good responses when the developed media is implemented in flipped classroom learning. In future research, this medium can be applied to all learning materials. Not only in writing fairy tales but also in the aspect of reading or listening. In addition, *Appy pie* can be applied not only to elementary school students, but also to all students in Indonesia.

REFERENCES

[1] H. Hamidi and A. Chavoshi, "Analysis of the essential factors for the adoption of mobile learning in higher education: A case study of students of the University of Technology," *Telemat. Informatics*, vol. 35, no. 4, pp. 1053–1070, 2018, doi: 10.1016/j.tele.2017.09.016.
[2] M. Hammer, K. Scheiter, and K. Stürmer, "New technology, new role of parents: How parents' beliefs and behavior affect students' digital media self-efficacy," *Comput. Human Behav.*, vol. 116, pp. 1–9, 2021,

doi: 10.1016/j.chb.2020.106642.

[3] U. H. Salsabila and N. Agustian, "Peran teknologi pendidikan dalam pembelajaran," *Islam. J. Keislam. dan Ilmu Pendidik.*, vol. 3, no. 1, pp. 123–133, 2021.

[4] C. Hasanudin, A. Fitrianingsih, and K. Saddhono, "How is the student's negotiation text in collaborative learning of flipped classroom and a Cyberlink power director media apps," *Ingénierie des Systèmes d'Information*, vol. 24, no. 6, pp. 559–567, 2019, doi: 10.18280/isi.240601.

[5] I. Aznar-Díaz, F. J. Hinojo-Lucena, M. P. Cáceres-Reche, and J. M. Romero-Rodríguez, "Pedagogical approaches in the knowledge society: The flipped classroom method for the development of creativity and dialogical learning," *Int. J. Emerg. Technol. Learn.*, vol. 15, no. 3, pp. 4–14, 2020, doi: 10.3991/ijet.v15i03.11664.

[6] C. K. Lo, K. F. Hew, and G. Chen, "Toward a set of design principles for mathematics flipped classrooms: A synthesis of research in mathematics education," *Educ. Res. Rev.*, vol. 22, pp. 50–73, 2017, doi: 10.1016/j.edurev.2017.08.002.

[7] L. R. Murillo-Zamorano, J. Á. López Sánchez, and A. L. Godoy-Caballero, "How the flipped classroom affects knowledge, skills, and engagement in higher education: Effects on students' satisfaction," *Comput. Educ.*, vol. 141, no. October 2018, 2019, doi: 10.1016/j.compedu.2019.103608.

[8] G. Akçayır and M. Akçayır, "The flipped classroom: A review of its advantages and challenges," *Comput. Educ.*, vol. 126, no. August, pp. 334–345, 2018, doi: 10.1016/j.compedu.2018.07.021.

[9] C. Hasanudin and A. Fitrianingsih, "Analisis gaya belajar mahasiswa pada pembelajaran flipped classroom," *J. Pendidik. Edutama*, vol. 6, no. 1, pp. 31–36, 2019, doi: 10.30734/jpe.v6i1.364.

[10] J. Julia *et al.*, "Flipped classroom educational model (2010-2019): A bibliometric study," *Eur. J. Educ. Res.*, vol. 9, no. 4, pp. 1377–1392, 2020, doi: 10.12973/eu-jer.9.4.1377.

[11] A. M. Al-zoubi and L. M. Sulaeiman, "Flipped Classroom Strategy Based on Critical Thinking Skills: Helping Fresh Female Students Acquiring Derivative Concept," vol. 14, no. 2, pp. 791–810, 2021.

[12] P. Girmen and M. F. Kaya, "Using the Flipped Classroom Model in the development of basic language skills and enriching activities: Digital stories and games," *Int. J. Instr.*, vol. 12, no. 1, pp. 555–572, 2019, doi: 10.29333/iji.2019.12136a.

[13] M. N. Tsai, Y. F. Liao, Y. L. Chang, and H. C. Chen, "A brainstorming flipped classroom approach for improving students' learning performance, motivation, teacher-student interaction and creativity in a civics education class," *Think. Ski. Creat.*, vol. 38, no. September, p. 100747, 2020, doi: 10.1016/j.tsc.2020.100747.

[14] R. Martínez-Jiménez and M. C. Ruiz-Jiménez, "Improving students' satisfaction and learning performance using flipped classroom," *Int. J. Manag. Educ.*, vol. 18, no. 3, 2020, doi: 10.1016/j.ijme.2020.100422.

[15] N. Mayasari *et al.*, "The Use of Microsoft Mathematics Program toward Students' Learning Achievement," *J. Phys. Conf. Ser.*, vol. 1764, no. 1, pp. 1–6, 2021, doi: 10.1088/1742-6596/1764/1/012132.

[16] M. S. Beck and K. Sitzman, "Compelling reasons for using digital stories to teach: A descriptive qualitative study," *Teach. Learn. Nurs.*, vol. 14, no. 4, pp. 265–269, 2019, doi: 10.1016/j.teln.2019.06.007.

[17] L. Weyand and M. M. Juzwik, "Schooling activist evangelical literacy: Speaking, writing, and storying Christian faith in dialogue with public secondary literacy curriculum," *Linguist. Educ.*, vol. 55, p. 100789, 2020, doi: 10.1016/j.linged.2019.100789.

[18] J. Sanders, "Sharing special birth stories. An explorative study of online childbirth narratives.," *Women and Birth*, 2018, doi: 10.1016/j.wombi.2018.12.009.

[19] V. F. Wong and J. M. H. Lim, "Linking communicative functions with linguistic resources in short stories: Implications of a narrative analysis for second language writing instruction," *System*, vol. 45, no. 1, pp. 147–162, 2014, doi: 10.1016/j.system.2014.05.008.

[20] C. Hasanudin, N. Mayasari, K. Saddhono, and R. A. Prabowo, "IbisPaint X Apps in Creating Collaborative 3D Learning media of Pop-Up and Movable Books," *J. Phys. Conf. Ser.*, vol. 1764, no. 1, pp. 1–8, 2021, doi: 10.1088/1742-6596/1764/1/012131.

[21] C. Prinsloo, "Students' intrinsic perspectives on the diverse functions of short stories beyond language learning," *System*, vol. 74, pp. 87–97, 2018, doi: 10.1016/j.system.2018.02.019.

[22] N. Sparapani, C. M. D. Connor, L. McLean, T. Wood, J. Toste, and S. Day, "Direct and reciprocal effects among social skills, vocabulary, and reading comprehension in first grade," *Contemp. Educ. Psychol.*, vol. 53, pp. 159–167, 2018, doi: 10.1016/j.cedpsych.2018.03.003.

[23] R. Retnowati *et al.*, "The effect of environmental teaching method and the level of natural intelligence on the environmental view of the students behavior," *J. Phys. Conf. Ser.*, vol. 1114, no. 1, pp. 1–7, 2018, doi: 10.1088/1742-6596/1114/1/012104.

[24] C. Hasanudin and A. Fitrianingsih, "Verbal linguistic Intelligence of the first-year students of Indonesian Education Program: A case in reading subject," *Eur. J. Educ. Res.*, vol. 9, no. 1, pp. 117–128, 2020, doi: 10.12973/eu-jer.9.1.117.

[25] J. Petty, "Creating stories for learning about the neonatal care experience through the eyes of student nurses: An interpretive, narrative study," *Nurse Educ. Today*, vol. 48, pp. 25–32, 2017, doi: 10.1016/j.nedt.2016.09.007.

[26] G. Barkhuizen, "Investigating multilingual identity in study abroad contexts: A short story analysis approach," *System*, vol. 71, pp. 102–112, 2017, doi: 10.1016/j.system.2017.09.014.

[27] Z. Hao *et al.*, "Alexithymia and mobile phone addiction in Chinese undergraduate students: The roles of mobile phone use patterns," *Comput. Human Behav.*, vol. 97, no. October 2018, pp. 51–59, 2019, doi: 10.1016/j.chb.2019.03.001.

[28] R. Martin Payo, M. M. Fernandez Álvarez, M. Blanco Díaz, M. Cuesta Izquierdo, S. R. Stoyanov, and E. Llaneza Suárez, "Spanish adaptation and validation of the Mobile Application Rating Scale questionnaire," *Int. J. Med. Inform.*, vol. 129, no. March, pp. 95–99, 2019, doi: 10.1016/j.ijmedinf.2019.06.005.

[29] Y. T. Sung, H. Y. Lee, J. M. Yang, and K. E. Chang, "The quality of experimental designs in mobile learning research: A systemic review and self-improvement tool," *Educ. Res. Rev.*, vol. 28, no. February 2018, p. 100279, 2019, doi: 10.1016/j.edurev.2019.05.001.

[30] J. J. Willemse, K. Jooste, and V. Bozalek, "Experiences of undergraduate nursing students on an authentic mobile learning enactment at a higher education institution in South Africa," *Nurse Educ. Today*, vol. 74, pp. 69–75, 2019, doi: 10.1016/j.nedt.2018.11.021.

[31] M. Abbas, G.-J. Hwang, S. Ajayi, G. Mustafa, and M. Bilal, "Modelling and exploiting taxonomic knowledge for developing mobile learning systems to enhance children's structural and functional categorization," *Comput. Educ. Artif. Intell.*, vol. 2, no. January, p. 100007, 2021, doi: 10.1016/j.caeai.2021.100007.

[32] G. Putra, L. Khrisna, P. Suryapranata, and E. Kristia, "ScienceDirect ScienceDirect Enhancing Historical Learning Using Role-Playing Game on Mobile Platform," *Procedia Comput. Sci.*, vol. 179, pp. 886–893, 2021, doi: 10.1016/j.procs.2021.01.078.

[33] P. Vallejo-Correa, J. Monsalve-Pulido, and M. Tabares-Betancur, "A systematic mapping review of context-aware analysis and its approach to mobile learning and ubiquitous learning processes," *Comput. Sci. Rev.*, vol. 39, p. 100335, 2021, doi: 10.1016/j.cosrev.2020.100335.

[34] M. M. Chusni, R. Zakwandi, S. Ariandini, M. R. Aulia, M. F. Nurfauzan, and T. A. A, *Appy pie untuk Edukasi Rancang Bangun Media Pembelajaran Berbasis Android*. Yogyakarta: Media Akademi, 2018.

[35] P. Andriotis, G. Stringhini, and M. A. Sasse, "Studying users' adaptation to Android's run-time fine-grained access control system," *J. Inf. Secur. Appl.*, vol. 40, pp. 31–43, 2018, doi: 10.1016/j.jisa.2018.02.004.

[36] E. Vasilakaki and V. Moniarou-Papaconstantinou, *9 - Mobile technology and use of educational games in HE*. Chandos Publishing, 2021.

[37] R. Munoo and R. Abdullah, *Adding ADDIE to the Library Orientation Program at Singapore Management University Libraries*. Kylie Bailin, Ben Jahre and Sarah Morris, 2018.

[38] R. M. Branch, *Instructional Design: The ADDIE Aproach*. USA: University ogf Georgia, 2009.

[39] E. Padmo, D, *Learning Technology Improving the Quality of Learning through Learning Technology*. Ciputat: Pusat Teknologi Komunikasi dan Informasi Pendidikan, 2004.

[40] S. Siregar, *Quantitative Research Methods: Equipped with Comparison of Manual & SPSS Calculations*. Jakarta: Kencana, 2014.

[41] E. P. Widoyoko, *Evaluasi Program Pembelajaran Panduan Praktis bagi Pendidik dan Calon Pendidik*. Yogyakarta: Pustaka Belajar, 2011.

[42] C. Hasanudin, A. Fitrianingsih, and .., "The implementation of flipped classroom using screencast-o-matic to improve students' verbal linguistic intelligence," *Int. J. Eng. Technol.*, vol. 7, no. 4.15, pp. 435–439, 2018, doi: 10.14419/ijet.v7i4.15.23602.

[43] B. Holmes and J. Gardner, *E-Learning (Concepts and practice)*. London, Thousand, New Delhi: SAGE Publications, 2006.

[44] M. S. Muslimin, N. M. Nordin, A. Z. Mansor, and M. M. Yunus, "The design and development of mobieko: A mobile educational app for microeconomics module," *Malaysian J. Learn. Instr.*, no. Special Issues, pp. 221–255, 2017.

[45] S. Lijanporn and J. Khlaisang, "The development of an activity-based learning model using educational mobile application to enhance discipline of elementary school students," *Procedia - Soc. Behav. Sci.*, vol. 174, pp. 1707–1712, 2015, doi: 10.1016/j.sbspro.2015.01.825.

[46] R. D. Silverman, L. Artzi, D. M. Mcneish, A. M. Hartranft, M. Martin-beltran, and M. Peercy, "The relationship between media type and vocabulary learning in a cross age peer-learning program for linguistically diverse elementary school students," *Contemp. Educ. Psychol.*, 2018, doi: 10.1016/j.cedpsych.2018.12.004.

[47] S. C. Andersen *et al.*, "How Reading and Writing Support Each Other Across a School Year in Primary School Children," *Contemp. Educ. Psychol.*, 2018, doi: 10.1016/j.cedpsych.2018.09.005.

[48] R. B. Purnama, F. Sesunan, and C. Ertikanto, "Pengembangan Media Pembelajaran Mobile Learning Berbasis Android Sebagai Suplemen Pembelajaran Fisika SMA Pada Materi Usaha dan Energi," *J. Pembelajaran Fis. Univ. Lampung*, 2017.

[49] I. A. Astuti, *Modul Pembuatan Media Pembelajaran Berbasis Android*. Jakarta: Universiatas Indraprasta PGRI, 2016.