

Development of Android-Based Modern Indonesian Literature Crossword Learning Media Assisted by the Proprofs Application

Pengembangan Media Pembelajaran TeKa-Teki Silang Sastra Indonesia Modern Berbasis Android Berbantuan Aplikasi Proprofs

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Abstract

This study aimed to develop and evaluate Android-based crossword puzzle learning media for modern Indonesian literature using the ProProfs application. The research employed a Research and Development (R&D) methodology, collecting data through questionnaires and tests. Three types of questionnaires were distributed: material expert validation, media expert validation, and user validation. Additionally, user tests were conducted to assess comprehension of the literature content transformed into crossword puzzles. The combined validation results from material experts, media experts, and users yielded an overall average score of 3.77 out of 5, indicating that the developed learning media is appropriate for use in educational settings. This finding aligns with the results of four user trials, which demonstrated an average score of 80.6 out of 100, categorized as 'good' performance. These findings suggest that Android-based crossword puzzles can be an effective tool for engaging students with modern Indonesian literature. Future research could explore the long-term impact of this approach on literature comprehension and retention among various student populations.

Key words: *Crossword puzzle; profs application; modern indonesian literature*

Abstrak

Penelitian ini bertujuan untuk mengembangkan dan mengevaluasi media pembelajaran teka-teki silang berbasis Android untuk sastra Indonesia modern dengan menggunakan aplikasi ProProfs. Penelitian ini menggunakan metodologi Research and Development (R&D), dengan mengumpulkan data melalui kuesioner dan tes. Ada tiga jenis kuesioner yang disebar, yaitu validasi ahli materi, validasi ahli media, dan validasi pengguna. Selain itu, tes pengguna dilakukan untuk menilai pemahaman terhadap konten literatur yang diubah menjadi teka-teki silang. Hasil validasi gabungan dari ahli materi, ahli media, dan pengguna menghasilkan skor rata-rata keseluruhan 3,77 dari 5, yang menunjukkan bahwa media pembelajaran yang dikembangkan layak untuk digunakan dalam lingkungan pendidikan. Temuan ini sejalan dengan hasil uji coba empat kali oleh pengguna, yang menunjukkan skor rata-rata 80,6 dari 100, yang dikategorikan sebagai kinerja yang 'baik'. Temuan ini menunjukkan bahwa teka-teki silang berbasis Android dapat menjadi alat yang efektif untuk melibatkan siswa dengan pembelajaran sastra Indonesia modern. Penelitian selanjutnya dapat mengeksplorasi dampak jangka panjang dari pendekatan ini terhadap pemahaman dan ketahanan sastra di antara beragam populasi siswa.

Kata kunci: *Teka-teki silang; aplikasi proprofs; sastra indonesia modern*

INTRODUCTION

Innovative learning media that align with current developments, such as Android-based learning media, are necessary to fulfill the era of independent learning (Novaliendry et al. 2020). According to Kustandi & Sutjipto (2011), learning media serves as a medium for delivering messages from the sender to the recipient. More specifically, we tend to interpret the notion of media in the teaching and learning process as graphic, photographic, or electronic tools for capturing, processing, and

reconstructing visual or verbal information. In addition, Susanto (2012) defines learning media as anything that can help students and teachers achieve learning goals.

Enayati and Gilakjani (2020) asserted that media facilitates the learning process by acting as a communication tool, ensuring optimal learning outcomes. We hope that this communication will enhance the effectiveness, efficiency, and enjoyment of the learning process for students (Dwijayani, 2019). In addition, Hamidjojo in (Arsyad 2016) said that the media has limitations in the form of intermediaries that can be used by someone so that ideas, ideas, and opinions can be spread and conveyed to the person or group they are addressing. Furthermore, Hosnan (2014) asserted that the effective use and integration of learning media with learning objectives and content enhances the quality of teaching and learning activities.

The scope of modern Indonesian literature begins in the 1920s, a period that differs significantly from the development of literature in the current era (Teeuw 2014). This situation is what ultimately makes researchers innovate to transform the material into a crossword puzzle so that students in the current era can explore the material in a faster and more contemporary way with the help of the ProProfs application. The researcher uses the ProProfs application to create an Android-based crossword puzzle that showcases contemporary Indonesian literature. The proprofs application, a multiplatform tool, offers users a variety of interactive media creation options, including a crossword or crossword puzzle. Crossword puzzles, according to George and Dundes (in Oktorina 2005), are traditional oral expressions with one or more contradictory descriptive elements, where players must guess the answer. Crossword is a brain-training game where players fill in the boxes based on certain statements. This game, which is quite familiar to many people, has the opportunity to become a learning medium that can help students increase their learning motivation (Joshi 2021; Khaleel 2022).

An interactive learning medium is essential when dealing with online learning situations. Online crossword games are considered to be the best way to use them as a medium for learning (Patrick et al. 2018). In this game, students will improve their brain skills in solving problems by compiling vocabulary (Bella and Rahayu 2023; Silalahi et al. 2019). Solving the puzzle will hone students' cognitive abilities and stimulate their brain to think quickly and flexibly (Orawiwatnakul 2017). According to Silberman (2009), the procedure for using crossword puzzles is as follows: Explaining important terms or names related to the taught subjects is the first step. The second step is composing a simple crossword puzzle, including as many learning elements as possible. The last step is to arrange the guide words for filling out the crossword puzzle.

Modern Indonesian Literature is part of the Indonesian Language Education Study Program's History of Indonesian Literature course. This course's goal is to help students understand how the development of modern Indonesian literature began in the 1900s. Around 1920, Indonesian youth began to express feelings and ideas that were fundamentally different from those found in traditional local society, using literary forms that significantly deviated from older Malay, Javanese, and other literary forms, both oral and written (Erowati & Ahmad 2011). This marked the birth of modern Indonesian literature. The connection between modern Indonesian literature and students belonging to the alpha generation, who are often connected to technology, lies in the reflection of local wisdom in Indonesian literary works. The hope is that millennial students are able to think critically about understanding the nation's culture.

Muyaroah and Fajartia (2017) conducted relevant research on the development of Android-based learning media using the Adobe Flash CS 6 application in biology subjects. The findings of this study indicate that the use of Android-based learning media for learning outcomes in biology subjects is effective. This study defines effectiveness as the success of a system that actively and independently engages students in learning. The t-test results indicated that using Android-based learning media for student learning outcomes was effective. The difference between relevant research and actual research lies in the type of object and application utilized. e researchers focused on developing the scope of modern Indonesian literary material into Android-based crossword learning media. In addition, the ProProfs application assists in creating crossword puzzles based on Android. In addition, the ProProfs application boasts a simplistic design that enhances user ease. The author's search results showed that the development of android-based learning media in literature courses was not very significant. We hope that the availability of android-based modern Indonesian literary crossword learning media will boost student interest and motivation in learning activities.

METHODS

This study employed a research and development (R&D) methodology using the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) (Putra, 2011). We chose this approach to formulate and develop an effective product for meaningful use in language learning. The study involved three groups of participants: material experts, media experts, and students. We distributed questionnaires to these groups to evaluate the feasibility of the developed learning media. We also developed a test to assess users' comprehension of modern Indonesian literature content in the form of crossword puzzles.

Questionnaire responses were analyzed using mean scores, with the feasibility of the media determined by a Likert scale. The results of content validity were converted into interval values ranging from 0 to 5, categorizing the developed learning media's feasibility. The criteria for feasibility were as follows:

- 1.0–1.8: Not feasible
- 1.9–2.6: Less feasible
- 2.7–3.4: Quite feasible
- 3.5–4.2: Feasible
- 4.3–5.0: Very feasible

Descriptive statistical analysis techniques are used to process data obtained through questionnaires in the form of scores, which are converted into values or categories with reference to tables adapted from Sukardjo (2010) as presented in the following table.

Table 1. Conversion of scores on a five-point scale

Category	Value interval
$X > X_i + 1,8 S_{bi}$	Very worth it
$X_i + 0,6 S_{bi} < X \leq X_i + 1,8 S_{bi}$	Worthy
$X_i - 0,6 S_{bi} < X \leq X_i + 0,6 S_{bi}$	Decent Enough
$X_i - 1,8 S_{bi} < X \leq X_i - 0,6 S_{bi}$	Less Eligible
$X \leq X_i - 1,8 S_{bi}$	Not feasible

(Source: Sukardjo 2010)

Description:

X= actual score

X_i = ideal mean

S_{bi} = Standard deviation from the ideal score

FINDING AND DISCUSSION

32 students tested the learning media in the History of Literature course, specifically the Android-based crossword puzzles on modern Indonesian literature. The results of the student trials indicated that the presence of Android-based modern Indonesian literature learning media enhanced students' understanding, yielding a good average score. The distribution of a feasibility questionnaire on modern Indonesian literary learning media supported these results, indicating their suitability for use in literary history courses. The subsequent section will provide a detailed explanation of the research process and its outcomes.

1. Definition

The researcher conducted a needs analysis that aimed to find out the use of instructional media in literary history courses by distributing questionnaires to lecturers and students through the Google Form application with six statement items and yes-or-no answer choices. Below is a table showing the percentage of the needs analysis results with a yes answer to Android-based learning media.

Tabel 2. Analysis of the needs of learning media development

Statement item	Lecturer	Student
1	100%	93%
2	50%	78%
3	100%	84%
4	100%	81%
5	50%	62%

The table above shows that one lecturer in charge of the course chose to agree, and as many as 30 students voted yes. In statement 2, only one lecturer chose to agree, while 25 students voted yes. Next is statement 3, where all lecturers voted yes and 27 students voted yes. The third statement indicates that all lecturers in charge of the course voted yes, and as many as 26 students did so. The final point was that only one lecturer voted yes, and 20 students voted yes. The results of this needs analysis led to the conclusion that, on average, lecturers and students agreed with the development of Android-based modern Indonesian literature learning media.

2. Design

Design is the second stage of applying R&D research methods. This stage consists of three phases, namely: 1) classifying the material, 2) formulating questions and answers, and 3) designing a crossword puzzle. We carry out the three stages sequentially before moving on to the final stage, known as the development stage. Firstly, the researcher classifies the material based on its characteristics. The material grouping refers to the periodization of literature, starting with Balai Pustaka, Pujangga Baru, generation 45, generation 60 and 70, generation 90, and generation 2000. This grouping is intended to assist researchers in creating crossword puzzles based on contemporary Indonesian literature. In addition, this grouping simplifies the process for users to apply their knowledge.

Second, formulate the questions and answers. In this second stage, the researcher transforms the material from modern Indonesian literature into the form of statement questions, which are the typical characteristics of crossword puzzles in general. The questions and answers provided by the researchers came from a variety of sources, including journals, articles, and especially the book entitled History of Indonesian Literature by Rosida Erowati and Ahmad Bahtiar. We will transform six of these materials into cross-word questions.

Each material consists of crosswords A and B, so the total number of questions in modern Indonesian literature's crossword puzzles reaches 120. The ProProfs application is responsible for creating all of the learning media questions. Android users can access this application, which operates on multiple platforms. Each user must create an account by entering an email or social media account in order to access the ProProfs platform. To create a crossword puzzle, follow these steps: login to the ProProfs application > click brain games > click crossword > fill in the hint column and word column > create my game > play or share the link. Students who are linked can start playing this crossword game without any space restrictions. This Android application facilitates users' access to the learning media that researchers have developed. In modern Indonesian literature, there are seven major themes. The seven materials include the Balai Pustaka, Pujangga Baru, Angkatan 45, Angkatan 60, Angkatan 70, Angkatan 90, and Angkatan 2000. Each the ProProfs application transforms each material into crossword questions (versions a and b), presenting 120 crossword questions from modern Indonesian literature on Android-based learning media. can access the following links to learn about modern Indonesian literary material.

<https://www.proprofsgames.com/ugc/crossword/balai-pustaka-a/>

<https://www.proprofsgames.com/ugc/crossword/balai-pustaka-b/>

<https://www.proprofsgames.com/ugc/crossword/pujangga-baru-a/>

<https://www.proprofsgames.com/ugc/crossword/pujangga-baru-b/>

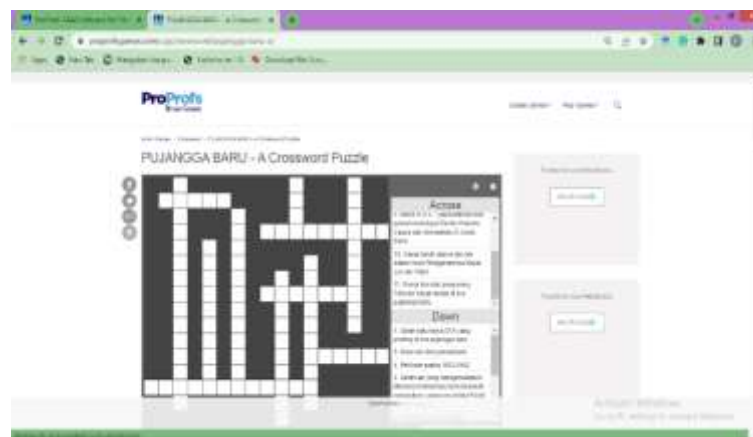
Development of Android-Based...

Researchers have created learning media, such as the link above. With their respective Android phones, users or students can access the link. The following is an example of a modern Indonesian literary crossword puzzle that the researcher has created as a learning tool.

Figure 1. Crossword puzzle for Balai Pustaka part A



Figure 2. Pujangga Baru Crossword material part A



3. Development

Once the design of the learning media has been completed, the researcher will proceed to develop it by requesting material, media, and user validation for the modern Indonesian literary learning media they have designed. The purpose of validating the experts is to determine the feasibility of the learning media the researchers have created, and to solicit their input and suggestions for further development. Researchers calculate the content validity, or CV, in each questionnaire they distribute to media experts, materials, and users to determine the feasibility of their learning media. Researchers will convert the CV results into value intervals, ranging from 0 to 5, to determine the feasibility of the learning media they have developed. There are five categories on the Likert scale, which consist of a value of one to five. The five values correspond to the following statements: (1) not feasible, (2) less feasible, (3) quite feasible, (4) feasible, and (5) very feasible. The following are details of the validation of material, media, and users that researchers carried out regarding the feasibility test of modern Indonesian literature crossword learning media assisted by the Android-based application Proprofs.

a. Material Expert Validation

The purpose of material validation is to determine the suitability of the material, translated into questions, within the context of contemporary Indonesian literature. The feasibility of this material is determined by calculating the total CV obtained from the researcher's questionnaire. The researcher's questionnaire encompasses two elements: the material's scope, comprising five indicators, and language usage, with six indicators. Material experts, who are lecturers in the field of literature, will assess these two aspects as indicators of the feasibility of learning media. The following are the results

of material validation on modern Indonesian literature crossword learning media, assisted by the Android-based ProProfs application.

Table 3. Material Expert Validation Results

No	Assessment Aspects	Total score	Average Score	Category
1	material scope	40	4	Worthy
2	language use	43	3,5	Worthy
TOTAL			3,75	Worthy

The material experts, comprising of two individuals, validated the material based on five indicators: 1) the crossword puzzles accurately reflect contemporary Indonesian literature; 2) the crossword puzzles' details align with contemporary Indonesian literature; 3) the crossword puzzles are comprehensible; 4) the answers to the crossword puzzles are accurate; and 5) the questions align with the student's knowledge level, with validator 1 scoring an average of 4.2 and validator 2 scoring an average of 3.8. The overall score for the material's scope is 4, indicating that it falls into the appropriate category.

The aspect of language use is comprised of six indicators: 1) The terms used in crossword puzzles are appropriate and appropriate; 2) Statement questions can be understood; 3) The language used is easy to understand; 4) The language used is typical of crossword puzzles; 5) The spelling is correct and appropriate; and 6) The grammar used aligns with the student's cognitive average score, with validator 1 awarding a total score of 3.6 and validator 2 awarding a score of 3.5. The overall score for language use is 3.5. The average score for the scope of the material and language use was 3.75, indicating that the validator deemed the material in the crossword puzzle questions from modern Indonesian literature to be appropriate for use as a learning medium.

b. Media Expert Validation

Researchers validated the android-based modern Indonesian literary crossword learning media by seeking assistance from computer technology experts. The expert in question is a lecturer with a scientific background in computer science and information science. The purpose of this validation is to determine the feasibility of the learning media that the researchers have created. We carried out a media validation that encompassed several aspects, including media display aspects and media functional aspects. These two aspects serve as a guide for the validator to assess the feasibility of the media that the researcher uses. The following table shows the results of the validation carried out by media experts.

Table 4. Media Expert Validation Results

No	Assessment Aspects	Total score	Average Score	Category
1	media display	10	3.3	Decent Enough
2	media functional	15	3.75	Worthy
TOTAL			3,5	Worthy

The table above shows that the first aspect, the media display aspect, yielded a total score of 10. The indicators included in the media display aspect consist of 1) proportional font size, 2) proportional crossword box size, and 3) the placement of questions in the right corner, which makes it easier for the reader. The media validator assigns an average score of 3.3 to the aspect of media display, indicating that it falls into the moderate category. Next is the functional aspect of the media, which obtains a total score of 15 points. The indicators that guide the assessment include: 1) media access can be opened on all Androids; 2) the buttons on the screen work; 3) the media operates smoothly, and 4) answers can be typed easily. The validator awarded the media an average score of 3.75 for its functional aspects, indicating that it falls into the appropriate category. Media experts concluded from their media validation activities that the ProProfs application, with an average score of 3.5, enhances the learning media for modern Indonesian literary crossword puzzles based on Android.

DISCUSSION

The results of this research are consistent with several previous studies that found a 39% increase in student learning outcomes when using crossword puzzle learning media (Wulan et al., 2019). Apart from that, there is also research (Atiyah et al., 2019) that concludes that the use of crossword puzzle media combined with the NHT model provides effectiveness in learning activities. The researchers discuss their research below. After material and media experts validated the learning medium, the researchers tested it on 32 students. The researchers' first step involved preparing a learning media link for students to access. In the first meeting, the researcher explained the necessary steps and preparations for using the media, and during the second meeting, we tested the media. Kegiatan uji coba media dilakukan sebanyak 4 pertemuan dengan materi yang bervariasi. The materials used for the study include Angkatan Balai Pustaka, Pujangga Baru, Angkatan 45, and the 60's and 70's. The number of meetings provided is relevant to the study's effectiveness and efficiency. The first media trials utilized library materials. The trial results revealed that 2 students achieved the lowest score of 60 on this media test, while 10 students achieved the highest score of 85. This trial resulted in an average score of 78.5. The second trial, with material from Pujangga Baru, follows. In this second trial, there was an increase where the highest score obtained was 90 by three students, while the lowest score was 70 obtained by five students. The average score obtained in this second trial was 81.6.

We used Angkatan 45 material for the third trial. In this third trial, the average score decreased from 81.6 in the second trial to 80.4 in the third trial. In this third trial, the lowest score was 70 obtained by 3 students, while the highest score was 85 with 15 students. The fourth trial, with material from the 1960s and 1970s, is the last. In the final trial, five students achieved the highest score of 90 and the lowest score of 70. The four trials produced an average result of 80.6, or good. These results indicate that the transformation of modern Indonesian literary material into modern Indonesian literary crosswords has provided students with adequate knowledge and understanding. Following the testing phase, the next stage involves user validation of the tested media. The goal of user validation is to ascertain the viability of the tested media in educational endeavors. Users assess two aspects of learning media during validation activities. The first aspect relates to the appearance of learning media, and the second aspect relates to the process of teaching and learning activities. The following are the results of user validation of the media used in learning activities, as viewed through the lens of modern Indonesian literature.

The aspect of evaluating the appearance of learning media consists of several indicators, namely 1) proportional font size, 2) proportional crossword box size, and 3) placement of questions in the right corner, which makes it easier for the reader. The results show that aspect one has a total score of 12.06 and an average score of 4.02, indicating that it meets the learning media eligibility category. The second aspect, which consists of four indicators, comes next. 1) users understand the use of media; 2) media crosswords are captivating and useful; 3) media crosswords help in the learning process; and 4) learning motivation increases when using media.

The results of user validation in the second aspect show a total score of 16.75 with an average of 4.1, which means that the learning media based on the assessment of the second aspect is in a decent category. Users' validation activities yielded an average score of 4.06, indicating that the learning media is suitable for use in learning activities. These results align with the four trials conducted, where users achieved an average score of 80.6, placing them in the good category. The following is a table that shows the overall validation results.

Table 5. Media Feasibility Results

No	Assessment Aspects	Average Score	Category
1	Material expert validation	3,75	Worthy
2	Media expert validation	3,5	Worthy
3	User validation	4,06	Worthy
TOTAL		3,77	Worthy

The table above demonstrates the feasibility of developing modern Indonesian literature learning media using the ProProfs application. This is evidenced by the assessment of the validators,

all three of whom have the same conclusion that the media developed by the researcher is feasible to use in learning activities.

CONCLUSION

The development process of the Android-based crossword puzzle learning media for modern Indonesian literature consisted of three stages: definition, design, and development. In the definition stage, it was concluded that there was a general consensus on the importance of creating Android-based learning media for modern Indonesian literature. Based on initial observations, researchers gathered relevant literary material and created crossword questions. To transform the material into interactive crossword puzzles, the ProProfs application was utilized. The media was then validated by material experts, media experts, and student users. Additionally, four trials were conducted involving 32 students to evaluate the effectiveness of the Android-based crossword puzzle media in enhancing literary knowledge. The validation process resulted in an average score of 3.77 out of 5, indicating that the developed media was suitable for use in learning activities. The trials demonstrated a significant improvement in student learning outcomes. Further research is needed to strengthen these initial conclusions. However, the initial results suggest that the crossword puzzle format adds an element of play to learning activities, potentially increasing student motivation and engagement with modern Indonesian literature.

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