



Development of Appsmart Based on Self-Directed Learning with Articulate Storyline for Drama Scripts

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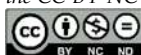
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Abstract: This Research aims to develop and test the effectiveness of the Appsmart learning application, based on the Self-Directed Learning (SDL) model supported by Articulate Storyline, for drama script learning in the Indonesian Language and Literature Education Study Program at Universitas Muhammadiyah Sumatera Utara. The Research uses the Research and Development (R&D) method with the ADDIE development model (Analysis, Design, Development, Implementation, Evaluation). The Research subjects are fourth-semester students enrolled in a Drama course. The Research instruments include expert validation sheets, user response questionnaires, comprehension tests, writing skill assessment rubrics, observations, and interviews. The Research results show that the Appsmart application received a "Very Feasible" rating from experts and a "Very Practical" rating from users, and demonstrated significant effectiveness in improving students' understanding and script-writing skills. This application also supports students' learning independence in accordance with SDL principles. Thus, Appsmart contributes to providing innovative, effective, interactive, and adaptive learning media for drama script learning in higher education.

Abstrak: Penelitian ini bertujuan untuk mengembangkan dan menguji efektivitas aplikasi pembelajaran Appsmart berbasis model *Self Directed Learning* (SDL) yang didukung oleh *Articulate Storyline* dalam pembelajaran naskah drama di Program Studi Pendidikan Bahasa dan Sastra Indonesia Universitas Muhammadiyah Sumatera Utara. Penelitian menggunakan metode *Research and Development* (R&D) dengan model pengembangan ADDIE (*Analysis, Design, Development, Implementation, Evaluation*). Subjek penelitian adalah mahasiswa semester IV yang sedang mengambil mata kuliah Drama. Instrumen penelitian meliputi lembar validasi ahli, angket respon pengguna, tes pemahaman, rubrik penilaian keterampilan menulis, observasi, dan wawancara. Hasil penelitian menunjukkan bahwa aplikasi Appsmart memperoleh penilaian "Sangat Layak" dari ahli, kepraktisan "Sangat Praktis" dari pengguna, dan efektivitas yang signifikan dalam meningkatkan pemahaman serta keterampilan menulis naskah drama mahasiswa. Aplikasi ini juga terbukti mendukung kemandirian belajar mahasiswa sesuai prinsip SDL. Dengan demikian, Appsmart berkontribusi dalam menyediakan media pembelajaran inovatif yang efektif, interaktif, dan adaptif bagi pembelajaran naskah drama di perguruan tinggi.

A. Introduction

The development of information and communication technology has had a significant impact on various aspects of life, including education. Digital transformation in education is accelerating, especially after the COVID-19 pandemic, which has required learning to be conducted online (Amutha, 2020; Sucipto, 2022). In the context of education in Indonesia, the utilization of digital technology has become one of the main strategies to improve the quality of learning and expand access to education (Subroto et al., 2023). The integration of technology in learning not only provides alternative delivery methods but also creates a more dynamic, interactive, and learner-centred learning environment (Niswa & Kharisma, 2021; Suryadi, 2019).

Drama script learning in Indonesian education faces challenges, including conventional approaches and low student engagement (Nurhasanah, 2022). Literature learning, especially drama script material, is an important component of the Indonesian curriculum. Drama scripts not only teach language skills, but also develop students' cognitive, affective, and psychomotor aspects (Arianto, 2021; Muslim et al., 2022). However, several studies reveal that drama script learning still faces various challenges, including limitations in engaging learning media, conventional learning approaches, and students' limited active participation (Andani et al., 2023; Restela et al., 2025). These conditions affect students' low interest and motivation in learning drama scripts (Andani et al., 2023; Nasution & Saragih, 2025; Saragih et al., 2021).

The Self-Directed Learning (SDL) model offers a potential approach to overcome these problems. SDL is a learning model that gives learners autonomy to determine their learning needs, formulate goals, identify learning resources, choose learning strategies, and evaluate their own learning outcomes (Delos Reyes & Caballes, 2021). Several recent studies have shown that implementing the SDL model can increase students' motivation to learn, critical thinking skills, and learning independence (Ashaeryanto et al., 2020; Sharma & Deepti, 2024; Wasyilah et al., 2021). SDL-based learning is very relevant to the demands of the digital era, which requires learners to continuously adapt to the development of knowledge and technology (Morris & König, 2020).

The utilization of Articulate Storyline as an interactive learning media development tool has attracted the attention of educational researchers and practitioners (Ariadiny & Bektiningsih, 2023; Sinambela & Pratiwi, 2024). Articulate Storyline enables the development of interactive learning content with features such as animation, simulation, quizzes, and feedback, which can be tailored to learners' needs (Hrmo et al., 2020). Research by Hafiedz & Nurhamidah (2023) found that using Articulate Storyline in language learning can improve learners' understanding of concepts and language skills. In addition, Ajmadewi et al (2024) and Hadza et al (2020) stated that Articulate Storyline facilitates the development of learning media that support various learning styles and learners' preferences.

Although there are many studies on the SDL model and the utilization of Articulate Storyline in learning, there remains a Research gap regarding their integration in the context of drama script learning (Ajmadewi et al., 2024; Rofiah et al., 2024). Most Research on SDL

in literature learning focuses on aspects of learning independence without optimally integrating digital technology (Beaven, 2021). On the other hand, Research on the use of Articulate Storyline in language and literature learning focuses more on the technical aspects of media development than on its integration with specific learning models (Harlinda & Suratmi, 2024). Therefore, the development of learning applications that integrate the SDL model with Articulate Storyline is important to enrich the literature and practice of drama script learning (Anggraini & Reinita, 2022)

Appsmart is an innovative learning application designed using the SDL model and built with Articulate Storyline. It is developed to facilitate drama script learning in an interactive, adaptive, and learner-centred manner. In contrast to conventional learning applications, Appsmart provides a learning environment that allows learners to control their own learning process in accordance with the principles of SDL. This aligns with the views of Nelliraharti et al (2023), who emphasize the importance of learner empowerment in learning in the digital era.

The advantage of Appsmart lies in the integration between the SDL model and Articulate Storyline features that support drama script learning. The app provides features such as learning needs assessment, setting learning objectives, interactive learning resources, drama script-writing simulation, and self-evaluation (Liu et al., 2024). These features are designed to develop learners' understanding and skills in writing drama scripts, while building their learning independence (Razanah et al., 2024). According to Hacker & Niederhauser (2000), learning applications that integrate SDL principles with interactive technologies can facilitate meaningful, deep learning.

In the context of Indonesian education, Research on the development of learning applications based on the SDL model for drama script materials remains limited. Most of the learning applications developed tend to adopt a direct learning approach and provide less space for learner independence (Fauziyah & Haryanto, 2024; Saragih et al., 2024). In addition, learning applications for drama script material are generally still informative and do not develop students' practical skills in writing drama scripts (Suryani, 2019). Therefore, the development of Appsmart is expected to fill this gap and make a significant contribution to the innovation of drama script learning in Indonesia.

The challenge in developing learning applications based on the SDL model, assisted by Articulate Storyline, lies not only in technical aspects but also in integrating relevant pedagogical principles. Alnufaie (2022) emphasizes that the success of learning applications is not only determined by the sophistication of technology but also by its suitability to learners' needs and characteristics. Similarly, Yau & Joy (2010) state that the development of learning apps should consider the socio-cultural context and learners' learning preferences. Therefore, Appsmart was developed by considering not only technological aspects, but also pedagogical aspects and learning contexts.

Based on this background, this study aims to develop and test the effectiveness of the Appsmart learning application, based on the SDL model and assisted by Articulate Storyline, for drama script material. Specifically, this study aims to: (1) describe the

development process of the Appsmart learning application, (2) analyze the validity and practicality of the Appsmart learning application, and (3) evaluate the effectiveness of the Appsmart learning application in improving understanding and skills in writing drama scripts. The results of this study are expected to make theoretical and practical contributions to the development of innovative learning media for drama scripts, as well as to enrich discussions on integrating the SDL model with digital technology in Indonesian language and literature education.

B. Method

This Research on the development of Appsmart learning applications based on the Self-Directed Learning model, assisted by Articulate Storyline on drama script material, uses a Research and Development (R&D) approach with the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The ADDIE model was chosen because it provides a systematic, comprehensive framework for developing learning products (Branch, 2009). This Research was conducted at Universitas Muhammadiyah Sumatera Utara, involving students of the Indonesian Language and Literature Education Study Programme.

The subjects in this study were fourth-semester students in the Indonesian Language and Literature Education Study Programme at Universitas Muhammadiyah Sumatera Utara who were enrolled in the Drama course. The selection of Research subjects was carried out using a purposive sampling technique, with consideration of the fact that these students were studying drama script material and had access to adequate technological devices.

Research procedures in this study were carried out in the following stages: (1) Analysis Stage. At this stage, researchers conducted a needs analysis to identify problems and needs in learning drama scripts. (2) Design Stage. At this stage, researchers design the concept of learning applications based on the analysis results. (3) Development Stage. At this stage, researchers develop learning applications based on the design. (4) Implementation Stage. At this stage, researchers apply the learning application in a real context. (5) Evaluation Stage. At this stage, researchers evaluate the effectiveness of learning applications

The instruments used in this Research include: (1) Expert validation sheet, (2) User response questionnaire, (3) Drama script comprehension test, (4) Drama script writing skill assessment rubric, (5) Learning observation guidelines, and (6) Interview guidelines.

The data obtained in this study were analyzed using both quantitative and qualitative methods. Here is how to examine in this study:

1) Analysis of validity data

Data from expert validation were analyzed using quantitative descriptive methods to calculate the feasibility percentage. The eligibility criteria were set using a Likert scale with four categories:

- a) very feasible (81-100%),
- b) feasible (61-80%),

- c) quite feasible (41-60%), and
d) not feasible ($\leq 40\%$)
- 2) Practicality data analysis
Data from the user response questionnaire were analysed using quantitative descriptive methods, and the practicality percentage was calculated. Practicality criteria were determined using a Likert scale with four categories:
a) very practical (81-100%),
b) practical (61-80%),
c) moderately practical (41-60%), and
d) not practical ($\leq 40\%$) (Akbar, 2020).
- 3) Effectiveness data analysis
Data from the comprehension test and the assessment of drama script-writing skills were analyzed using an independent t-test to compare the learning outcomes of the experimental and control groups. Before the t-test, a normality test (Kolmogorov-Smirnov) and a homogeneity test (Levene's Test) were conducted. Data analysis was performed using SPSS version 25.
- 4) Qualitative data analysis
Data from observations and interviews were analyzed using qualitative analysis techniques of the Miles, Huberman, and Saldana (2020) model, which includes data condensation, data presentation, and conclusion drawing. This analysis was conducted to obtain in-depth information about the process of using learning applications and students' learning experiences.

C. Result

The Research on the development of the Appsmart learning application based on the Self-Directed Learning model, assisted by Articulate Storyline on drama script material, was conducted at Universitas Muhammadiyah Sumatera Utara. The following Research results are obtained based on the stages of development Research that have been carried out. The final results of the developed media are shown in the following figure.



Figure 1. Form of Media Developed

Product Development Results

1. Analysis Stage Results

a. Learning Needs Analysis

Based on the results of interviews with lecturers teaching Drama courses and a survey of 60 students of the Indonesian Language and Literature Education Study Programme, several problems were found in learning drama scripts, including:

Table 1. Student needs analysis

No.	Needs Analysis	Percentage
1	Students expressed difficulty in understanding the structure and elements of drama scripts	78,3%
2	Students assess that the learning media used so far are less interactive and interesting	85%
3	Students expect learning media that can be accessed flexibly	73,3%
4	Students stated that they need learning media that provides freedom to learn at their own pace	81,7%.
5	Students have difficulty writing drama scripts due to the lack of examples and directed practice	68,3%.

The results of this needs analysis indicate the need to develop interactive, flexible learning applications that support student independence in learning drama script material.

b. Analysis of Student Characteristics

Analysis of student characteristics shows that:

Table 2. Student character analysis

No.	Character Analysis	Percentage
1	Students already have digital devices (laptop/smartphone) that can be used to access learning applications	93,3%.
2	Students have sufficient digital literacy to operate computer-based learning applications	85%
3	Students prefer learning that gives them freedom to manage their own learning process	76,7%
4	students' learning style based on visual	42%
5	students' learning style based on auditory	28%
6	students' learning style based on kinesthetic	30%

The results of this analysis serve as the basis for designing learning applications that accommodate diverse student learning characteristics and preferences.

c. Material Analysis

Based on the analysis of the Drama course Semester Learning Plan (RPS), the drama script materials developed in the learning application include:

Table 3. Material Analysis

No.	Analysis of the material developed
1	Basic concept of a drama script
2	Structure of a drama script
3	Elements of a drama script
4	Types of drama scripts
5	Drama script writing techniques
6	Drama script writing practice

The material is systematically organized and presented as learning modules that students can study independently.

d. Technology Analysis

The results of the technology analysis show that Articulate Storyline version 3.0 has features that support the development of SDL model-based learning applications, among others:

Table 4. Technology Analysis

No.	Supporting Technology Analysis
1	Ability to create interactive content with various formats (text, images, audio, video, and animation)
2	Triggers and layers feature that allows users to control navigation and interaction within the application
3	The quiz maker feature supports various question types and can provide immediate feedback
4	Ability to track the user's learning progress
5	Output that can be accessed through multiple devices (responsive design)

2. Results of the Design Stage

a. Formulation of Learning Objectives

Based on the material analysis, the following learning objectives were formulated:

Table 5. Formulation of learning objectives

No	Formulation of learning objectives
1	Students can explain the basic concepts of a drama script correctly
2	Students can identify the structure of a drama script correctly
3	Students can analyze the elements of a drama script carefully
4	Students can distinguish types of drama scripts based on their characteristics
5	Students can apply drama script writing techniques well
6	Students can write drama scripts in accordance with the correct writing rule

b. Preparation of Learning Materials

The learning materials are organized into six modules aligned with the SDL model's principles. Each module is equipped with:

Table 6. Learning Completeness

No.	Learning Completeness
1	Initial assessment to identify student learning needs
2	Specific learning objectives
3	Multimedia presented learning materials
4	Examples of relevant drama scripts
5	Exercises to reinforce understanding
6	Self-assessment to measure achievement of learning objectives
7	Additional learning resources to deepen the material

c. Storyboard Design

The storyboard for the learning application is designed with the learning flow based on the SDL model. The application consists of several main parts:

Table 7. Storyboard of learning

No.	Page	Design
1	Main page (dashboard)	displays information about the app and navigation menu
2	Profile page	store student data and learning progress
3	Assessment page	needs to identify student learning needs
4	Module page	learning that contains learning materials and activities
5	Exercise page	contains various types of questions and drama script writing exercises
6	Evaluation page	measures students' understanding and skills
7	Learning resources page	contains additional references

d. Evaluation Instrument Design

Evaluation instruments were designed to measure comprehension and drama script writing skills, including:

- Comprehension test with multiple choice and description formats.
- Rubric for assessing drama script-writing skills, including structure, elements, language, and originality.
- Self-assessment instrument to facilitate student reflection and self-evaluation.

3. Development Stage Results

a. Content Development

Learning content is developed in various media formats:

Table 8. Learning Content and Developing

No.	Content	Development
1	Text material	systematically organized and supported with illustrations
2	Images and infographics	visualizes important concepts
3	Audio narration	explains material and provides instructions

No.	Content	Development
4	Video tutorials	Examples of staged drama scripts
5	Animation	illustrates the process of writing a drama script
6	Interactive simulation	offers practical experience in writing drama scripts

b. Application Development

Appsmart learning application is developed using Articulate Storyline version 3.0 by integrating the principles of the SDL model:

- 1) Learning needs assessment feature that allows students to identify their learning needs.
- 2) A goal-setting feature that helps students formulate specific learning objectives.
- 3) Flexible navigation features to give students the freedom to choose the material to be learnt.
- 4) Interactive features that allow students to be actively involved in the learning process.
- 5) A feedback feature that provides information about students' progress and achievement.
- 6) Self-assessment feature that facilitates evaluation of learning outcomes.
- 7) Reflection feature that encourages students to reflect on their learning process.

c. Product Validation

The Appsmart learning application was validated by seven validators, comprising three material experts, two media experts, and two learning experts. The validation results are presented in Table 9.

Table 9. Appsmart Learning Application Validation Results

No.	Aspect Assessment	Percentage	Category
1	Material Feasibility	87,5%	Very Good
2	Media Feasibility	85,8%	Very Good
3	Learning feasibility	88,2%	Very Good
	Overall Average	87,2%	Very Good

Based on Table 9, the Appsmart learning application had an average feasibility of 87.2% in the 'Very Feasible' category. This shows that the developed learning application is feasible for learning drama scripts.

d. Phase I Product Revision

Based on the suggestions and input from the validators, several revisions were made to the learning application, including:

- 1) Improvements to some material explanations that are less detailed.
- 2) Adding more contextualized drama script examples.

- 3) Improvements to some less user-friendly interfaces.
- 4) Adjustment of the difficulty level of the exercise questions.
- 5) Optimization of application performance on various devices.

4. Results of the Implementation Stage

a. Small Group Trial

The small-group trial was conducted with 10 students to assess the practicality of the learning application. The results of the small group trial are presented in Table 10.

Table 10. Results of the Small Group Trial

No	Assessment Aspects	Percentage	Category
1	Ease of Use	84,5%	Very Practical
2	Usability	86,3%	Very Practical
3	Attractiveness	88,7%	Very Practical
	Overall Average	86,2%	Very Practical

Based on Table 10, the Appsmart learning application achieved an average practicality score of 86.2% in the 'Very Practical' category. This shows that the developed learning application is practical for learning drama scripts.

b. Phase II Product Revision

Based on the suggestions and input from the small group trial, several revisions were made to the learning application, including:

- 1) Improvements to some navigation features that are less responsive.
- 2) Addition of more detailed instructions for use.
- 3) Optimization of application performance on low-spec devices.
- 4) Improvement of some unclear audio content.

c. Field Trial

Field trials were conducted with 60 students, divided into an experimental group (30) and a control group (30). The experimental group used the Appsmart learning application in learning drama script material, while the control group used conventional learning methods.

Data on understanding and writing skills were collected through tests and performance assessments.

5. Evaluation Stage Results

a. Effectiveness of Learning Application

The effectiveness of the Appsmart learning application in improving understanding and writing skills for a drama script was analyzed using an independent t-test. The analysis results are presented in Tables 11 and 12.

Table 11. Independent t-test Results for Comprehension of Drama Script

Group	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Experiment	30	82,57	7,43	5,728	58	0,000
Control	30	71,83	8,21			

Table 12. Independent t Test Results for Drama Script Writing Skills

Group	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Experiment	30	84,23	6,85	6,142	58	0,000
Control	30	73,47	7,39			

Based on Table 11 and Table 12, there is a significant difference in the understanding and writing skills of drama scripts between the experimental and control group students (Sig. < 0.05). The mean scores for the experimental group's comprehension and drama script-writing skills were higher than those of the control group. This shows that the Appsmart learning application is effective at improving understanding and writing skills for drama scripts.

b. Student Learning Independence

Student independence in learning was measured through observation sheets and interviews. The results of observations of student learning independence are presented in Table 13.

Table 13. Observation Results of Student Learning Independence

No.	Aspects of Learning Independence	Percentage	Category
1	Ability to determine learning objectives	85,7%	Very good
2	Ability to choose appropriate material	83,4%	Very good
3	Ability to manage study time	81,2%	Very good
4	Ability to monitor the learning process	82,8%	Very good
5	Ability to evaluate learning outcomes	84,5%	Very good
	Overall Average	83,5%	Category

Based on Table 13, student learning independence obtained an average percentage of 83.5% in the 'Very Good' category. This shows that the Appsmart learning application can facilitate students' learning independence in learning drama script material.

Interview results show that the Appsmart learning application provides a positive learning experience. Students feel freer in managing their learning process, more motivated to learn, and more confident in writing drama scripts. Some excerpts from interviews with students are as follows:

'Appsmart helps me learn according to my own pace and learning style. I can choose the material I want to learn and repeat the material I have not understood.' (Student 3)

'I like the self-assessment feature in this app. I can immediately know which parts I have mastered and which parts I need to study again.' (Student 8)

The examples of drama scripts and interactive simulations really helped me in understanding how to write a good drama script. I feel more confident when writing my own drama script.' (Student 15)

D. Discussion

The results showed that the Appsmart learning application, based on the SDL model and assisted by Articulate Storyline, is feasible, practical, and effective for learning drama scripts. The feasibility of the learning application is demonstrated by expert validation results, which place it in the 'Very Feasible' category. The practicality of the learning application is shown by the results of the small-group trial, which put it in the 'Very Practical' category. The effectiveness of the learning application is demonstrated by the results of an independent t-test, which show a significant difference in understanding and writing skills between the experimental and control group students.

The success of the Appsmart learning application in improving understanding and writing skills for drama scripts is inseparable from its integration of the SDL model with Articulate Storyline's interactive learning features. The SDL model gives students autonomy over their learning process, while Articulate Storyline provides a platform for developing interactive, engaging learning content. The integration of the two creates a learning environment that supports students' learning independence in learning drama script material.

This finding aligns with Research indicating that self-directed learning (SDL) models can enhance students' learning outcomes and skills. The implementation of SDL has been shown to improve learning activities, academic performance, and learning independence among university students (Izzatanur & Rachmadtullah, 2024; Rahayu et al., 2023). At the primary school level, SDL has a positive impact on students' critical thinking abilities (Sugerman et al., 2022). For high school students, SDL supported by digital tools such as the Notion website can significantly enhance essential thinking skills compared to traditional methods (Baharuddin et al., 2022). Furthermore, digital literacy competence and self-regulated learning, which are closely related to SDL, positively influence university students' learning motivation in blended learning environments (Mulyati, 2023). These findings suggest that SDL is an effective pedagogical approach across educational levels, promoting critical thinking, independence, and motivation while aligning with the demands of the digital era.

The use of Articulate Storyline as a learning app development platform is proven effective in creating interactive learning content. Features such as triggers, layers, and quiz maker enable the development of learning applications that are responsive to user input and can provide immediate feedback. Several researchers have found that Articulate Storyline-based media are well-suited for educational use, with expert evaluations consistently scoring above 90% for both material and media quality (Ariadiny & Bektiningsih, 2023; Auvisena & Fathurrahman, 2024). Articulate Storyline has been shown to increase

motivation in language learning, with 81% of respondents reporting its effectiveness in Indonesian language learning.

The superiority of the Appsmart learning application over conventional learning media lies in its integration of the SDL model with interactive features that support drama script learning. This application not only provides learning materials in multimedia format, but also facilitates students to control their own learning process in accordance with the principles of SDL. Features such as learning needs assessment, goal setting, flexible navigation, interaction, feedback, self-assessment, and reflection support the development of students' learning independence (Melliana & Diana, 2024).

The results of observations and interviews show that the Appsmart learning application can facilitate students' learning independence in learning drama script material. Students can determine learning objectives, select appropriate material, manage study time, monitor the learning process, and evaluate their own learning outcomes. This aligns with the views of Ningsih & Herwanis (2024), who emphasise the importance of empowering learners in the digital era.

Although this study showed positive results, several limitations need to be considered. Firstly, this study is limited to drama scripts and does not cover other drama materials, such as performances. Secondly, this study involved only students of the Indonesian Language and Literature Education Study Program at Muhammadiyah University of North Sumatra, so generalisation of the Research results needs to be done carefully. Thirdly, this study has not analysed the long-term impact of using the Appsmart learning application on students' understanding and writing skills in drama scripts.

E. Implication

The results of this study make a significant contribution to the development of knowledge in language and literature education, especially in the learning of drama scripts. This Research supports strengthening the self-directed learning paradigm as an approach relevant to the demands of 21st-century learning. The findings confirm that integrating the SDL model with interactive technologies, such as Articulate Storyline, can create a more adaptive, engaging, and effective learning experience that improves understanding of concepts and drama script-writing skills.

Another implication is that the results of this study strengthen the position of digital learning as a strategy that is not only an alternative but also essential in the context of higher education, especially post-pandemic. Appsmart, as an innovative product, has been proven to encourage student learning independence –an important competency in higher education today. Therefore, this Research supports the development of theories and practices of technology-based learning in language education, while opening up space for replication and adaptation in other courses and scientific fields.

F. Limitation and Suggestion for Further

Although the results show that the Appsmart application is effective in improving students' understanding and drama script writing skills, this study has several limitations. Firstly, the scope of the material developed is limited to drama scripts and does not cover other aspects, such as drama performance or the analysis of different literary texts. Secondly, the Research subjects consisted solely of students from one study program at Universitas Muhammadiyah Sumatera Utara, so generalizing the results to a wider population must be done with caution. Thirdly, the evaluation of effectiveness was conducted only in the short term, so the long-term impact of using the application on students' learning abilities and independence remains unknown.

Based on these limitations, future Research is recommended to expand the scope of the learning materials developed, including drama performance and analysis in more detail. Research can also be conducted by involving participants from various educational institutions to increase the external validity of the study results. In addition, a longitudinal study is needed to assess the sustainability of Appsmart's effects on students' academic achievement and cognitive development over the long term. Evaluating the app's influence on different learning styles and on technology accessibility is also a potential area for further exploration.

G. Conclusion

Based on Research and data analysis, the development of the Appsmart learning application, grounded in the Self-Directed Learning (SDL) model and supported by Articulate Storyline, is deemed feasible, practical, and effective for learning drama scripts. The Appsmart application significantly improved students' understanding of drama script concepts and writing skills compared to conventional learning methods. In addition, this application encourages students' learning independence, allowing them to self-regulate their learning process according to their individual needs and preferences. The integration of the SDL model with Articulate Storyline's interactive features in Appsmart creates a more dynamic, adaptive learning experience and supports the development of critical thinking skills. Therefore, this app is recommended as an innovative learning medium for teaching drama scripts, particularly to improve the quality of Indonesian language and literature education in the digital era.

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
















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