

Development of "Orkapi Online" Media to Improve Sociology Learning Outcomes in Social Structure Material for Package C Students

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Abstract

This study developed and evaluated "Orkapi Online," a digital learning medium designed to facilitate Sociology instruction on social structure for Package C learners at PKBM Orkapi Semarang. The study adopted a Research and Development approach based on the ADDIE model, encompassing analysis, design, development, implementation, and evaluation. Media feasibility was evaluated through expert judgment using the Content Validity Ratio (CVR), Content Validity Index (CVI), Percentage of Agreement (PA), and Intraclass Correlation Coefficient (ICC), while effectiveness was assessed using a quasi-experimental pretest-posttest control-group design. The validation yielded a CVI of 0.95, PA of 0.92, and ICC of 0.88, demonstrating strong expert agreement on the suitability of the media content and design. The experimental group achieved a higher mean posttest score (87) than the control group (72) and obtained a high N-Gain score of 0.75. Questionnaire data also indicated positive tendencies in learning initiative, time management, and responsibility, although these findings were interpreted descriptively due to the absence of complete inferential analysis of learning independence. Overall, "Orkapi Online" demonstrated adequate feasibility and was associated with improved Sociology learning outcomes within the study context. Further studies involving larger samples and more rigorous measurement of learning independence are recommended to confirm its effectiveness and broader applicability.

Keywords: ADDIE, Digital learning media, Learning independence, Orkapi Online, Sociology learning.

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I. INTRODUCTION

Equivalency education through the Package C program provides an alternative pathway for individuals who are unable to participate in formal schooling to obtain an education equivalent to senior high school (Machmudah, 2025; Mustofa et al., 2025). Beyond expanding educational access, the program contributes to improving learners' knowledge and competencies in responding to social and professional demands. Within this context, Sociology is particularly important because it enables learners to understand social phenomena, patterns of interaction, and the dynamics of community life while developing critical and analytical thinking about social realities (Lilik Tahmidaten, 2021). Effective Sociology instruction should therefore extend beyond the transmission of conceptual knowledge and provide opportunities for learners to develop social awareness, reflective thinking, and independence in managing their learning. These competencies are increasingly relevant amid rapid social change that requires individuals to become adaptive, critical, and autonomous learners (Pasa et al., 2025).

Despite this importance, the implementation of Sociology learning in equivalency education continues to face several challenges. Instruction in Community Learning Centers (Pusat Kegiatan Belajar Masyarakat [PKBM]) is frequently characterized by tutor-centered practices, lectures, and reliance on predominantly textual printed modules (Ariesta et al., 2024). Such practices provide limited opportunities for learners to interact with learning materials, explore concepts independently, or participate actively in discussions. Consequently, learners may become passive recipients of information rather than active participants in constructing their understanding. Previous studies have associated these conditions with limited conceptual understanding, learning engagement, and independence among equivalency education learners (Pratama et al., 2025; Sukmana et al., 2025).

These challenges are particularly relevant to Sociology because many of its concepts require learners to connect abstract theoretical ideas with observable social realities. Learners may have difficulty understanding concepts such as social interaction, social structure, and social change when

instruction emphasizes memorization rather than conceptual relationships and contextual applications (Mulia et al., 2024). Limited use of interactive and contextual learning media may further restrict learners' ability to visualize and interpret these concepts. Moreover, insufficient variation in instructional activities can reduce engagement and participation, potentially affecting both learning outcomes and learners' independence in managing the learning process (Maulidia & Muthi, 2025).

The problem of learning independence is especially important in equivalency education because Package C learners may have different educational backgrounds, schedules, and responsibilities outside the classroom. These characteristics require learning environments that provide greater flexibility in terms of time, place, pace, and access to learning resources. However, national-level reports indicate that independent learning remains a challenge among Package C learners, particularly in learning initiative and time management. Difficulties in understanding abstract learning materials have also been reported (Ministry of Education, Culture, Research, and Technology, 2024). These conditions highlight the need for instructional approaches that simultaneously provide flexible access to learning resources and encourage learners to assume greater responsibility for their learning.

Similar problems were identified at PKBM ORKAPI Semarang. Initial observations indicated that Sociology instruction remained largely tutor-centered and relied primarily on printed modules with limited interactive features. Learners tended to depend on tutors' explanations, demonstrated limited initiative to explore additional learning resources, and experienced difficulties in independently explaining fundamental Sociology concepts. Institutional educational report data also indicated a decline in Sociology learning outcomes. These preliminary findings suggest that existing instructional practices have not yet provided sufficient support for active engagement, conceptual understanding, and independent learning.

Digital learning environments offer a potential response to these challenges. The increasing accessibility of smartphones and online learning resources enables learners to engage with instructional materials beyond scheduled face-to-face sessions. Digital platforms can integrate text, audiovisual materials, interactive activities, quizzes, and other learning resources within a single environment, thereby allowing learners to access and revisit materials according to their individual needs. Such flexibility is particularly relevant to equivalency education, where learners may need to balance learning activities with employment, family responsibilities, or other commitments.

For Sociology instruction, digital learning platforms may also facilitate the contextualization of abstract concepts by connecting theoretical content with examples of social phenomena presented through multimedia resources. In addition to providing access to learning materials, online platforms can create opportunities for learners to regulate their learning pace, select relevant resources, manage study time, and evaluate their own understanding. These features have the potential to support both conceptual learning and greater independence in the learning process. Previous studies have reported positive relationships between the use of digital learning environments and learners' motivation, participation, and academic outcomes. Nevertheless, the effectiveness of a digital learning medium depends not only on the use of technology itself but also on how its content, instructional activities, and interface are designed to address the characteristics and needs of its intended learners.

Although digital learning has been widely investigated in formal education, its development and application within equivalency education remain comparatively limited. More specifically, there is still limited evidence concerning digital platforms specifically designed for Sociology learning among Package C learners and adapted to the learning context of PKBM. Existing studies have generally examined digital learning media or online platforms in broader educational settings, leaving insufficient evidence regarding how a context-specific platform can support Sociology learning outcomes and learning independence in non-formal equivalency education. This represents an important contextual and practical gap, particularly for PKBM settings in which flexible access and learner autonomy are essential.

To address this gap, the present study developed "Orkapi Online," a digital learning medium designed specifically to support Sociology learning on social structure for Package C learners at PKBM ORKAPI Semarang. The platform was developed to provide a more interactive, flexible, and contextually relevant learning environment while accommodating the characteristics of equivalency

education learners. Accordingly, this study aimed to develop and evaluate the feasibility of Orkapi Online and examine its effectiveness in supporting Sociology learning outcomes. Learners' independence was also examined to provide descriptive evidence regarding tendencies in learning initiative, time management, and responsibility during the implementation of the digital learning medium.

II. METHOD

This study employed a Research and Development (R&D) approach based on the ADDIE model, comprising five stages: analysis, design, development, implementation, and evaluation (Lumbantobing et al., 2019). The study was conducted at PKBM Orkapi Semarang and involved Package C students enrolled in Sociology learning, particularly on the topic of social structure. The study population consisted of 63 students. The development process aimed to produce "Orkapi Online," a digital learning medium designed to provide flexible, interactive, and contextual learning experiences for students in equivalency education.

During the analysis stage, students' learning needs, difficulties in understanding social structure, learner characteristics, and limitations of existing learning resources were identified. Based on these findings, the design stage involved organizing learning objectives, Sociology content, instructional activities, visual components, navigation, and assessment features into a media storyboard. The design was subsequently transformed into an Orkapi Online prototype during the development stage. The platform incorporated social structure materials, visual representations, instructional videos, contextual cases, interactive quizzes, discussion activities, independent exercises, and feedback features (Wati, 2022). The prototype was then evaluated by 10 expert validators to assess the appropriateness of its content and media design, and their feedback was used to revise the product before implementation.

Content validity was examined using the Content Validity Ratio (CVR) and Content Validity Index (CVI). With 10 validators, a CVR value of 0.62 was used as the minimum acceptance criterion. Consistency among validators was further assessed using the Percentage of Agreement (PA) and Intraclass Correlation Coefficient (ICC), with PA values above 0.80 and ICC values of at least 0.75 considered indicative of acceptable inter-rater agreement. Qualitative comments and recommendations from the validators were also considered during product revision.

The preliminary effectiveness of Orkapi Online was examined using a quasi-experimental pretest-posttest control-group design. Students in the experimental group received Sociology instruction using Orkapi Online, whereas those in the control group received conventional instruction supported by printed learning materials. Both groups completed a pretest before the intervention and a posttest after the intervention to assess learning outcomes related to social structure. In addition, students in the experimental group completed a learning-independence questionnaire covering learning initiative, time management, and responsibility. Because the questionnaire was administered only to the experimental group, these data were treated as supplementary descriptive evidence rather than as a between-group measure of effectiveness.

Prior to inferential analysis, normality and homogeneity of variance were examined using the Kolmogorov-Smirnov test and Levene's test, respectively. Differences in learning outcomes between the experimental and control groups were analyzed using an independent-samples inferential test according to the distributional assumptions of the data. Improvement in learning outcomes was additionally assessed using normalized gain (N-Gain) based on the difference between pretest and posttest scores relative to the maximum possible improvement. N-Gain values were categorized as high ($g \geq 0.70$), moderate ($0.30 \leq g < 0.70$), or low ($g < 0.30$). Finally, evidence from expert validation, learning-outcome analysis, and the supporting questionnaire was integrated during the evaluation stage to determine the feasibility and preliminary effectiveness of Orkapi Online.

III. RESULTS AND DISCUSSION

A. Results

1. Media and Design Implementation

The development stage resulted in "Orkapi Online," a digital learning platform designed to support Sociology learning on social structure for Package C students. The platform integrates

textual, visual, audiovisual, and interactive components within a structured learning environment. Its content was organized into accessible learning units to facilitate the presentation of social structure concepts in a contextual and systematic manner.

The learning materials cover the definition of social structure, its main elements—including social status, roles, and norms—forms of social structure such as social differentiation and stratification, and the functions of social structure in society. These materials are complemented by illustrations, diagrams, concept maps, and contextual social cases that connect theoretical concepts with situations encountered in everyday life. For instance, examples illustrating the relationship between social status and social roles, as well as the formation of social strata, were incorporated to contextualize key concepts.

In addition to content presentation, Orkapi Online includes learning videos, interactive quizzes, discussion forums, independent exercises, automated feedback, and structured navigation. These features were designed to provide opportunities for students to access learning materials independently, evaluate their understanding, interact with tutors and peers, and receive immediate feedback on selected learning activities. The platform can also be accessed flexibly, allowing students to engage with learning resources beyond scheduled instructional sessions. Overall, the developed platform consists of nine key components that address content presentation, contextualization, interaction, assessment, independent practice, feedback, and accessibility. The components and their intended instructional functions are summarized in Table 1.

Table 1. Key Components and Intended Learning Functions of “Orkapi Online”

No.	Media Component	Description	Intended Function in Learning
1	Social Structure Learning Materials	Presents definitions, elements, forms, and functions of social structure	Provides systematically organized conceptual content
2	Visualizations and Illustrations	Includes illustrations, diagrams, and concept maps related to social structure	Supports the representation of abstract concepts in a more concrete form
3	Social Case Studies	Presents contextual examples and social phenomena from everyday life	Connects theoretical concepts with real-world social contexts
4	Learning Videos	Provides audiovisual presentations of selected learning materials	Offers an alternative format for accessing and understanding learning content
5	Interactive Quizzes	Provides digital assessments with immediate feedback	Enables students to assess and reinforce their understanding
6	Discussion Forum	Facilitates interaction between students and tutors	Provides opportunities for discussion, interaction, and collaborative learning
7	Independent Practice	Provides individual learning tasks and exercises	Facilitates independent practice and self-directed learning activities
8	Automated Feedback	Provides immediate responses to selected quizzes and learning tasks	Supports self-evaluation and identification of areas requiring improvement
9	Platform Navigation	Provides a structured and user-friendly menu system	Facilitates access to learning materials and activities

2. Feasibility and Validity of “Orkapi Online” Media through Expert Judgment

The feasibility of “Orkapi Online” was evaluated through expert judgment involving 10 media experts and 10 Sociology subject-matter experts. The analysis focused on content validity and consistency among evaluators.

The Content Validity Ratio (CVR) results showed that all evaluation items exceeded the minimum criterion of 0.62. This indicates that the items used to assess the developed media were considered essential by the validators. The overall Content Validity Index (CVI) was 0.95, indicating a high level of agreement regarding the relevance and appropriateness of the evaluated components. These results suggest that both the Sociology content and the digital learning design of Orkapi Online were considered appropriate for use in Package C learning.

Inter-rater consistency was further examined using the Percentage of Agreement (PA) and Intraclass Correlation Coefficient (ICC). The analysis produced a PA value of 0.92 and an ICC

value of 0.88, both exceeding the predetermined acceptance criteria of 0.80 and 0.75, respectively. These findings indicate a high level of consistency among validators in evaluating the quality of the developed media. Overall, the expert-validation results provide evidence supporting the feasibility of Orkapi Online prior to its implementation with students.

3. Effectiveness of “Orkapi Online” on Students’ Learning Outcomes

The preliminary effectiveness of Orkapi Online was examined by comparing the learning outcomes of students in the experimental and control groups. Students in the experimental group learned using Orkapi Online, whereas those in the control group received conventional instruction supported by printed learning materials. Prior to hypothesis testing, the posttest data were examined for normality and homogeneity of variance. The Kolmogorov–Smirnov test indicated that the data from both groups were normally distributed, while Levene’s test showed that the variances were homogeneous. These results supported the use of a parametric independent-samples t-test.

The experimental group achieved a mean posttest score of 87, whereas the control group obtained a mean score of 72. The t-test results showed that the calculated t-value exceeded the critical value at the 0.05 significance level, leading to rejection of the null hypothesis. This finding indicates that students who learned using Orkapi Online achieved significantly higher posttest learning outcomes than those who received conventional instruction.

4. Normalized Gain Analysis

The improvement in students’ learning outcomes was further examined using normalized gain (N-Gain). The experimental group obtained an average N-Gain score of 0.75, which falls within the high category. This result indicates a high level of improvement in learning outcomes following the use of Orkapi Online.

Table 2. N-Gain Categories and Interpretation

N-Gain Score	Category	Interpretation
$g \geq 0.70$	High	High level of improvement
$0.30 \leq g < 0.70$	Moderate	Moderate level of improvement
$g < 0.30$	Low	Low level of improvement

The N-Gain result complements the posttest comparison by showing that students in the experimental group experienced substantial improvement from their initial learning performance. However, the N-Gain value should be interpreted as an indicator of learning improvement rather than as independent evidence of causal effectiveness.

Questionnaire responses from the experimental group also showed positive tendencies in learning initiative, time management, and responsibility. Because the learning-independence questionnaire was administered only to the experimental group and was not subjected to a complete between-group inferential analysis, these findings were interpreted descriptively. Therefore, the data suggest positive patterns of learning independence during the use of Orkapi Online but do not provide sufficient evidence to conclude that the platform caused a statistically significant improvement in learning independence.

B. Discussion

The findings demonstrate that “Orkapi Online” achieved a high level of feasibility based on expert evaluation. The CVI of 0.95, supported by a PA of 0.92 and an ICC of 0.88, indicates strong agreement and consistency among validators regarding the relevance and appropriateness of the developed media. These results provide evidence that the integration of Sociology content, visual presentation, navigation, and interactive learning components was considered suitable for implementation with Package C learners. Importantly, the consistency across validators strengthens confidence that the feasibility judgment was not dependent on the assessment of individual evaluators.

The feasibility of the developed media is particularly meaningful in Sociology learning, where students are required to understand relationships among abstract concepts and their

manifestations in social life. Concepts such as social status, roles, norms, differentiation, and stratification may be difficult to understand when presented primarily through definitions and textual explanations. Orkapi Online addresses this challenge by integrating conceptual explanations with illustrations, concept maps, contextual cases, learning videos, interactive quizzes, and feedback. Such multimodal and contextual presentation provides learners with multiple representations of the same concepts and opportunities to connect theoretical knowledge with observable social phenomena. Rather than positioning students merely as recipients of information, these features are designed to support more active engagement with Sociology content.

The learning-outcome findings further indicate that students who used Orkapi Online performed better than those who received conventional instruction. The experimental group achieved a mean posttest score of 87, compared with 72 in the control group, with the inferential analysis indicating a statistically significant difference between the two groups. This finding suggests that the use of Orkapi Online was associated with better learning outcomes on social structure within the context of this study. The observed difference is educationally relevant because the platform was designed not merely to digitize existing materials but to reorganize learning content into a more interactive and contextually accessible environment.

One possible explanation for this improvement lies in the way Orkapi Online represents and contextualizes sociological concepts. Social structure involves relationships among concepts rather than isolated factual information. By incorporating visual representations and examples of social phenomena, the platform provides opportunities for learners to identify these relationships and apply conceptual knowledge to familiar situations. For example, connecting social status with corresponding social roles or illustrating differentiation and stratification through everyday social cases may facilitate movement beyond the memorization of definitions toward interpretation and application. Nevertheless, these mechanisms should be regarded as plausible pedagogical explanations rather than directly measured cognitive processes, as the present study did not specifically assess how learners processed different representations within the platform.

The N-Gain score of 0.75 provides complementary evidence that the experimental group experienced a high level of improvement between the pretest and posttest. This finding is consistent with the higher posttest performance observed among students using Orkapi Online. However, the N-Gain result should not be interpreted independently as proof of causal effectiveness. Rather, it provides descriptive evidence of the magnitude of improvement and should be considered alongside the between-group inferential analysis. Taken together, these findings indicate that the implementation of Orkapi Online was associated with meaningful improvement in Sociology learning outcomes during the intervention.

The potential value of the platform should also be understood in relation to the characteristics of Package C equivalency education. Unlike conventional school settings, equivalency education may involve learners with diverse educational backgrounds, learning schedules, and responsibilities outside formal learning activities. Dependence exclusively on scheduled face-to-face instruction and printed modules may therefore limit opportunities for continuous engagement with learning materials. The digital accessibility of Orkapi Online allows learners to revisit materials and complete selected learning activities beyond scheduled sessions. This flexibility represents an important practical feature for learning environments in which students require greater control over the time and pace of their learning.

The questionnaire findings provide additional insight into this aspect of the platform. Students in the experimental group demonstrated positive tendencies in learning initiative, time management, and responsibility. Access to materials, exercises, and feedback outside direct tutor instruction may provide conditions that support greater learner autonomy. Nevertheless, these results should be interpreted cautiously. Because learning independence was assessed only in the experimental group and complete pretest–posttest or between-group inferential evidence was not available, the findings cannot establish that Orkapi Online significantly improved learning independence. Instead, they provide preliminary descriptive evidence suggesting that students demonstrated positive patterns of independent learning while using

the platform. Future studies should employ validated measures administered to both experimental and control groups to determine whether these tendencies represent statistically and educationally meaningful changes.

The findings have both practical and research implications. Practically, Orkapi Online illustrates how digital learning media can be adapted to the specific instructional needs of Sociology in equivalency education by integrating contextual content, multimedia representations, interactive assessment, and flexible access within a single learning environment. From a research perspective, the study extends the application of digital learning development to a context that has received comparatively limited attention: Sociology learning among Package C students in a PKBM setting. Therefore, the contribution of the study lies not simply in the use of digital technology but in its context-specific development and implementation for non-formal equivalency education.

Several limitations should be considered when interpreting the findings. The study was conducted within a single PKBM setting with a relatively limited participant population, which restricts the generalizability of the results. Moreover, although differences in learning outcomes were examined inferentially, more complete reporting of the statistical results—including test statistics, degrees of freedom, exact *p*-values, confidence intervals, and effect sizes—would provide stronger evidence regarding the magnitude and precision of the observed effect. Learning independence also requires more rigorous evaluation because the available questionnaire data were descriptive and limited to the experimental group. Future research should therefore involve larger and more diverse samples, multiple PKBM settings, comprehensive psychometric assessment of the instruments, and comparative measurement of learning independence across groups.

Overall, the findings provide preliminary evidence that Orkapi Online is a feasible digital learning medium and that its implementation was associated with improved Sociology learning outcomes among Package C students in the study context. Its contextual presentation, interactive learning components, and flexible accessibility appear well aligned with the instructional needs of equivalency education. However, stronger experimental evidence and broader implementation are required before conclusions regarding its general effectiveness and impact on learning independence can be established.

IV. CONCLUSION

The development of “Orkapi Online” using the ADDIE model produced a feasible digital learning medium for Sociology learning on social structure among Package C students at PKBM Orkapi Semarang, as demonstrated by a CVI of 0.95, PA of 0.92, and ICC of 0.88. Students who used Orkapi Online achieved a higher mean posttest score (87) than those receiving conventional instruction (72), while the experimental group obtained a high N-Gain score of 0.75, indicating substantial improvement in learning outcomes. Questionnaire responses also revealed positive tendencies in learning initiative, time management, and responsibility; however, these findings should be interpreted descriptively because inferential evidence for learning independence was not available. Overall, Orkapi Online demonstrates potential as a digital learning medium for supporting Sociology learning in Package C equivalency education, although further studies involving larger and more diverse samples, comprehensive effect-size reporting, and more rigorous measurement of learning independence are required to establish its broader effectiveness and applicability.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest, whether financial, professional, or personal, that could have influenced the research process, interpretation of the findings, or publication of this article.

AUTHOR CONTRIBUTIONS

Badriyah contributed to the conceptualization, research design, media development, data collection, data analysis, interpretation of the findings, and preparation of the original manuscript. **Decky Avrilianda** contributed to the conceptualization, methodology, supervision, validation, interpretation of the findings,

and critical review and revision of the manuscript. Both authors reviewed and approved the final version of the manuscript and agreed to be accountable for the integrity and accuracy of the work.

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DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES

The authors declare that generative artificial intelligence (AI) and AI-assisted technologies were used solely to support language refinement and improve the clarity and readability of the manuscript. These technologies were not used to generate research data, conduct statistical analyses, interpret the findings, or formulate scientific conclusions. All AI-assisted content was carefully reviewed, verified, and revised by the authors, who take full responsibility for the accuracy, integrity, and final content of the manuscript.

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