# Development of Interactive Digital Books Based on Mendeley Tutorial Videos in Scientific Writing Learning for Hotel Operation Study Program PNB

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**Abstract.** This study was designed to enhance academic writing instruction in the Hotel Operations Study Program at Politeknik Negeri Bali (PNB). The study developed an interactive digital book incorporating Mendeley video tutorials. This initiative aimed to address common challenges faced by students in managing references and applying appropriate citation formats. The research employed a Research and Development (R&D) framework, beginning with a needs assessment and continuing through field testing, evaluation by subject-matter and media experts, and student feedback. The developed tool received a very high evaluation. Furthermore, the t-test results indicated a statistically significant improvement, with the experimental group achieving a mean post-test score of 7.5, compared with 4.9 in the control group. Therefore, the interactive digital book was considered highly feasible and effective as a self-directed learning medium. The product makes a positive contribution to facilitating students' ability to manage scholarly references systematically and accurately. The video tutorials embedded directly within the digital book were also found to assist students in understanding the technical steps involved in operating Mendeley through visual demonstrations.

**Keywords:** Development Research, Hotel Operation Study Program, Interactive Digital Books, Mendeley, Scientific Writing

## 1 Introduction

The ability to write scientific papers (scientific writing) is the main indicator of student academic success as well as a means of disseminating knowledge at the global level. In today's digital age, the writing process is no longer just about pouring ideas into text, but it also involves navigating complex literature and accurate reference management (Ariska et al., 2024). However, the transition from manual to digital methods in scientific writing still leaves various obstacles for students(Shah et al., 2009). Writing scientific papers is not only required for academic purposes in this digital age, but it is a fundamental skill that all students should possess. Writing final projects, journals, and papers requires accuracy in citations and bibliography compilation. Within ideal academic standards, any scientific paper should be based on relevant primary literature and have high integrity (Sulistyani, 2025).

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The Scientific Writing course is here to teach students how to properly prepare citations and bibliographies in order to prevent plagiarism. However, even though they are equipped with learning in the course, often final year students have difficulty citing (citing) and compiling bibliographies using the Mendeley application. The survey given to 30 final project guidance students concluded that students found it difficult to apply the Mendeley application because at the time of lectures they did not have a personal laptop so they could not practice directly individually. In addition, the survey also concluded that the courses obtained in semester 2 have a long distance in the preparation of the final project so that students forget how to apply Mendeley for citations and the preparation of references correctly. So the urgency of this research is that there is an urgent need for guidance that includes practical examples, project assignments, and easy-to-follow tutorials (Wheatley, 2024). The existing learning media is often considered less interactive and unable to provide the step-by-step assistance needed by students (Jaya & Bengkulu, 2025). Mendeley's software comes as a solution to automate citations, but many students find it difficult to operate it by simply reading a conventional textbook or taking a single socialization. Students' dependence on supervisors in terms of technical writing is very high.

The lack of self-accessible and repetitive learning media makes the process of adaptation to new technologies (such as Mendeley) slow. Interactive digital books allow for self-paced learning where students can practice reference management directly while watching visual guides, which effectively reduces manual errors and the risk of plagiarism(Ridzal, 2025; Handayani & Pamulang, 2025). Students need self-explanatory learning resources (being able to explain themselves) so that they do not constantly experience technical obstacles outside of lecture hours (Mandalika & Syahril, 2020). Static print books often fail to visualize the technical steps of software operation (Kencana et al., 2025;Mhlongo et al., 2023). Therefore, the development of Interactive Digital Books is needed. This medium combines instructional text with a Video Tutorial that integrates directly. With digital format, students can learn anytime and anywhere (mobile learning), as well as directly practice the tutorials they see.

## 2 Methodology

The ADDIE (Analysis, Design, Development, Implementation, Evaluation) development approach is used in this study (Rustandi, 2021) which is oriented towards the development of valid, practical, and effective learning products. Four stages are used in this study: the define stage, which aims to obtain an empirical overview; the design stage, which intends to create a first draft of an interactive digital book with Mendeley video tutorials based on professional and academic contexts; the develop stage, which aims to ensure the validity, practicality, and feasibility of the digital book; and the disseminate stage, which distributes the research findings while guaranteeing the product's continued use. This paradigm was selected because it is methodical, effective, and consistent with the research nature of interactive digital book production. (Syamsul & Kuliahsari, 2026).

a. Define stage this aims to obtain an empirical picture of the needs of students in studying Mendeley applications to conduct citations and preparation of references. At the needs analysis stage, this research began with data collection

through questionnaires and interviews with 29 final year students who were preparing their final projects, scientific writing teachers, and students who were programming scientific writing courses. In addition, an analysis of scientific writing curriculum documents was carried out to identify the core competencies needed in the Mendeley application to prepare the final project. At this stage, the survey questionnaire already has a reliability value with validity and reliability tests. The table 1 displays the validity and reliability test results:

**Table 1.** Questionnaire Validity and Reliability Test

| Cronbach's Alpha | N-of Items |
|---|---|
| 0.749 | 5 |

Cronbach's Alpha = 0.749 was determined from the output of the validity and reliability test results. Because the Cronbach's Alpha score is greater than 0.6, it may be concluded that the five survey questions are dependable. Reliable value means that the questions in the questionnaire can be relied upon to be used as a conclusion in the needs analysis stage.

b. Design Stage (Designing Interactive Digital Books with Mendeley Video Tutorials). The Design stage aims to produce an initial draft of an Interactive Digital Book with Mendeley Video Tutorials based on academic and professional contexts. In this process, a module structure was prepared that included learning objectives, and text materials using the Mendeley application.

c. Develop Stage, this stage aims to ensure the validity, practicality, and feasibility of digital books. The process begins with expert validation involving material experts, namely lecturers in scientific writing courses, media experts, lecturers in charge of information technology to assess aspects of UI/UX, interactivity, and video/audio quality. The aspects assessed include: the suitability of the material at the level of digital books with the learning of Mendeley material in the scientific writing course; readability of the material in the assessment of UI/UX aspects; as well as the quality of video and audio in embedded videos. According to the findings of expert evaluations, digital books are deemed highly valid if they receive a score in the extremely valid category. The next step is to put a group of students from two classes in the scientific writing course via a trial. The first class is referred to as a control class, which is a group class or class in experimental research that either employs a traditional approach with 30 students or is not given special treatment (independent variables). Additionally, the second class is the experimental class, which is the research sample group class that is given extra attention and a novel teaching strategy that is, the use of digital books with interactive videos. The efficacy of interactive digital books with Mendeley video lectures was then assessed by comparing the learning outcomes of the two classes.

d. The Disseminate stage is the final stage that aims to disseminate research results while ensuring the sustainability of product utilization. At this point, the trial's outcomes and validator input are used to carry out the module's final change. Socialization of interactive digital books to teachers of scientific writing courses so that the product can be implemented more widely.

The method used in this study can be shown in the Figure 1.

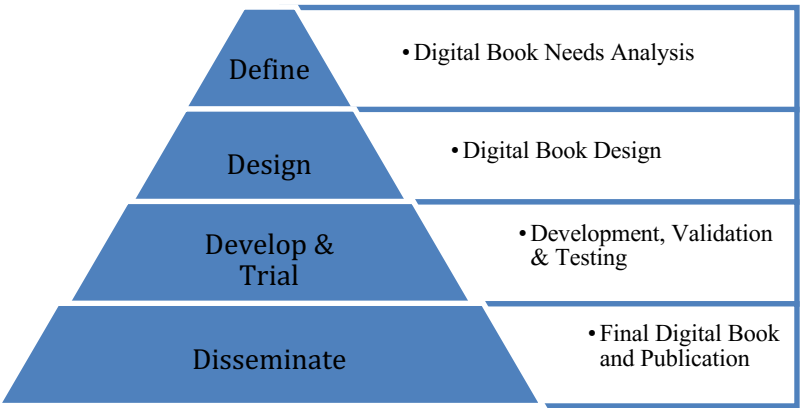



**Figure 1.** Research Flow Diagram

## 3 Result and Discussion

### 3.1 Result

At the definition stage (needs analysis), the results of a student survey on book needs were obtained. This stage has identified 3 needs that must be present in a digital book, where these 3 needs are depicted in the Figure 2, Figure 3 and Figure 4.

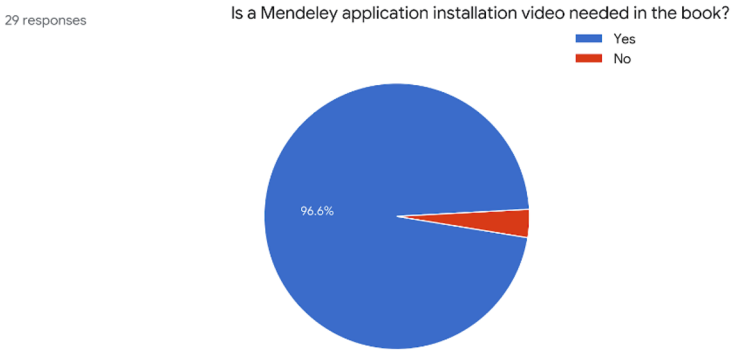



**Figure 2.** Mendeley installation respondent answer chart

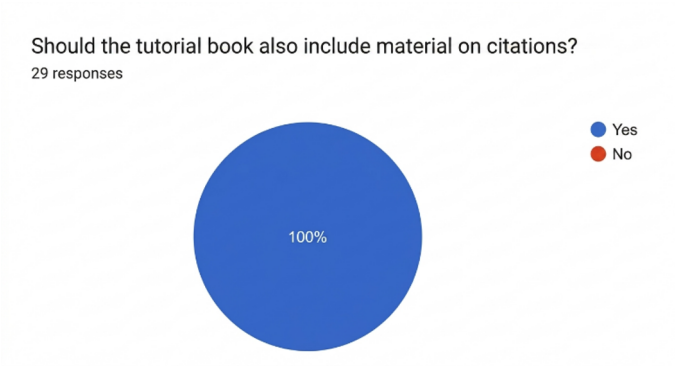



**Figure 3.** Answer chart of the respondent quoted material

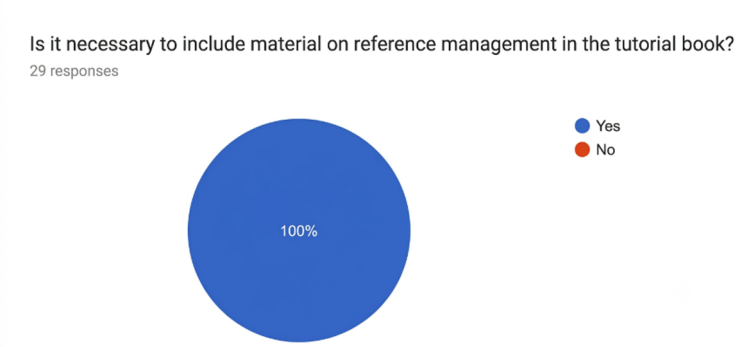



**Figure 4.** Reference management respondent answer chart

Three essential requirements for the digital book were determined based on the outcomes of the needs analysis phase: Mendeley installation steps with embedded explanatory videos, materials and videos on citations, and reference management procedures.

Furthermore, in the design stage, the researcher conducted an Interactive Digital Book Design with Mendeley Video Tutorial. In this process, a module structure was prepared which includes: Learning objectives, text materials using the Mendeley application and embed video materials in digital books. The result of this stage is a digital book that has been compiled by the team that can be accessed by the user interface of the book in Figure 5.

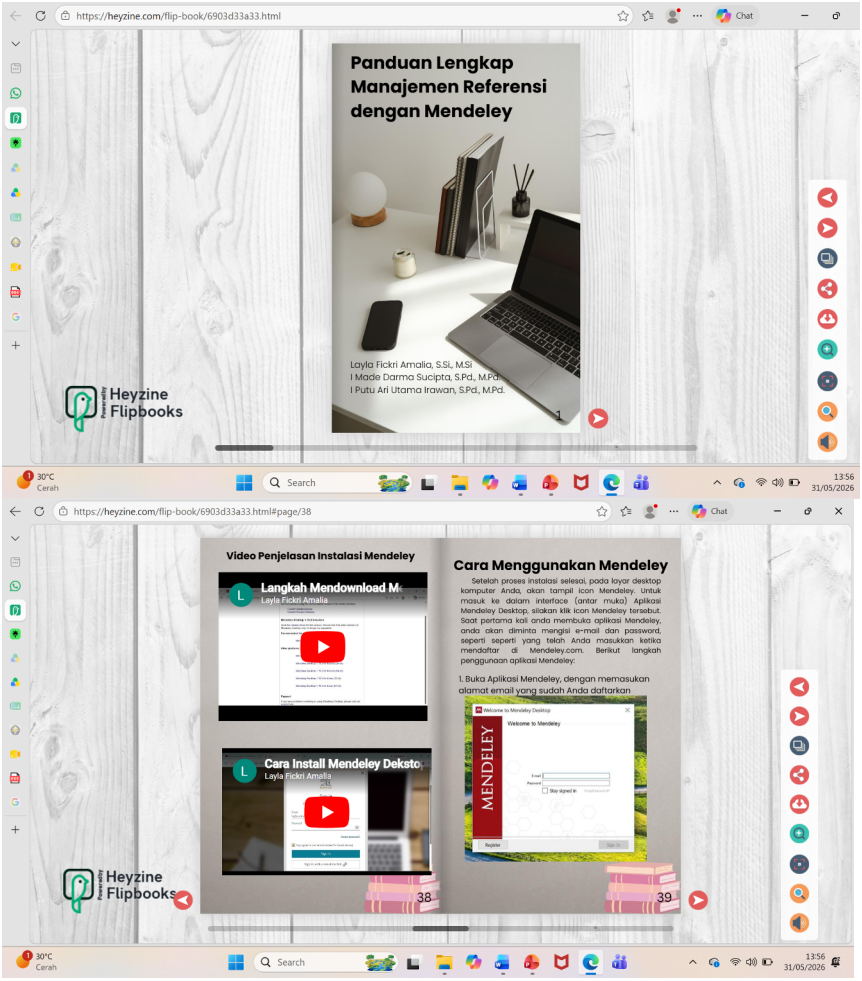
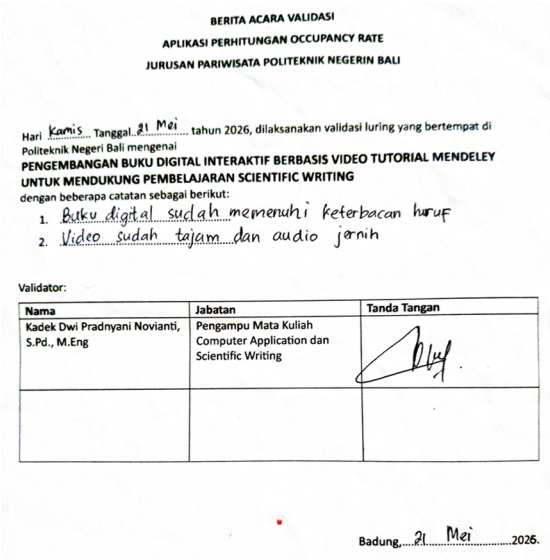



**Figure 5**. Digital Book User Interface

Additionally, the third stage the development and trial stage is carried out by the researcher following the needs analysis stage. In the development and testing phase, the first step starts with expert validation involving one content expert, who is the lecturer in charge of the scientific writing course, and a media expert, who is a lecturer specializing in information technology to assess UI/UX aspects, interactivity, and video/audio quality. The aspects assessed include: the suitability of the material at the level of digital books with the learning of Mendeley material in the scientific writing course; readability of the material in the assessment of UI/UX aspects; and video and audio quality in embedded video embeds. This aspect is assessed through discussion and direct evaluation of the digital book by the validator. In the assessment of the validator the assessment of this book obtained notes such as the Figure 6.



BERITA ACARA VALIDASI

APLIKASI PERHITUNGAN OCCUPANCY RATE

JURUSAN PARIWISATA POLITEKNIK NEGERIN BALI

Hari Kamis Tanggal 21 Mei tahun 2026, dilaksanakan validasi luring yang bertempat di Politeknik Negeri Bali mengenai

**PENGEMBANGAN BUKU DIGITAL INTERAKTIF BERBASIS VIDEO TUTORIAL MENDELEY UNTUK MENDUKUNG PEMBELAJARAN SCIENTIFIC WRITING**

dengan beberapa catatan sebagai berikut:

1. Buku digital sudah memenuhi keterbacan huruf
2. Video sudah tajam dan audio jernih

Validator:

| Nama | Jabatan | Tanda Tangan |
|---|---|---|
| Kadek Dwi Pradnyani Novianti, S.Pd., M.Eng | Pengampu Mata Kuliah Computer Application dan Scientific Writing | |
| | | |

Badung, 21 Mei 2026.

**Figure 6.** Validation Minutes from the Expert Team

Based on the validation results by Kadek Dwi Pradnyani Novianti, S.Pd., M.Eng., who is the lecturer for the Computer Application and Scientific Writing course, this interactive digital book based on Mendeley tutorial videos is considered very good and worthy of use. In terms of appearance, this digital book already meets the criteria for readable fonts that are comfortable for readers. In addition, the learning media support within it has also proven to be of high quality, shown through sharp visual videos and clear audio, making it very effective in helping students understand Scientific Writing. From the opinion of the expert it can be concluded that the digital book prepared is suitable to be used as a learning medium in scientific writing courses.

The group also studied how digital books affect scientific writing courses. To ascertain the impact of the learning resources, the researcher split the classes into two groups: the experimental group and the control group. The control group refuses to learn how to use Mendeley thru digital books. The presenters in this session use PowerPoint to teach the Mendeley program in a traditional manner. The class that receives treatment using digital book learning materials is known as the experimental class. Independent t-tests were used to compare the learning evaluation results of the experimental and control groups. Before comparing the values, in the t-test the data must meet several conditions, namely normal distribution, the data variant between the two groups must be the same (homogeneous), and free of outliers or no outlier data from both groups. The results of the Normality Test obtained the following outputs shown in Table 2.

**Table 2**. Normality Test

| Classes | Shapiro-Wilk | | |
|---|---|---|---|
| | Statistics | df | Sig. |
| Experiments | 0.851 | 30 | 0.07 |
| Controls | 0.873 | 30 | 0.08 |

Table 2 makes it evident that the sig values for both the experimental and control groups are greater than 0.05, suggesting that their data are regularly distributed. In order to determine if the data was homogenous or not, the variance homogeneity test was also used to the data. Table 3 displays the variance homogeneity test findings.

**Table 3.** Variance Homogeneity Test

| Value | Lavene Statistics | df1 | df2 | Sig |
|---|---|---|---|---|
| Based on Mean | 2.614 | 1 | 58 | 0.111 |
| Based on Median | 2.703 | 1 | 58 | 0.106 |
| Base on trimmed mean | 2.604 | 1 | 58 | 0.112 |

Table 3 shows that the two data are homogeneous based on the results of the homogeneity test of the variance of the sig value > 0.05. Additionally, the third test determines whether outliers or outlier data are present in the data. The boxplot diagram, which displays the results of the third test, is shown in Figure 7.

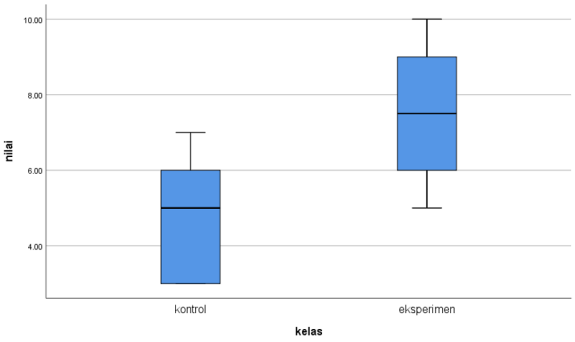



**Figure 7.** Digram Boxplot Experiment Class and Control Class

The assumption of normality is satisfied because there are no data points or asterisks outside the whisker lines in Figure 7. As a result, all requirements for an independent samples t-test were satisfied by the evaluation results from both the experimental and control groups. The following theories were then tested by the analysis:

$H_0: \mu_1 = \mu_2$ if the experimental group's mean score equals the control group's mean score.

$H_1: \mu_1 \neq \mu_2$ if the experimental group's mean score differs from the control group's mean score.

SPSS was used to test the data from the evaluation of the experimental class and the control class, producing the following results shown in Table 4.

**Table 4.** Independent T Test Output

| Value | F | Sig | T | df | Sig (2-tailed) |
|---|---|---|---|---|---|
| Equal variances assumed | 2.614 | 0.11 | -5.791 | 58 | 0.000 |
| Equal variances not assumed | | | -5.791 | 56.767 | 0.000 |

The null hypothesis ($H_0$) was rejected based on table 4's two-tailed significance value ($p = 0.000 < 0.05$), indicating a statistically significant difference between the experimental and control groups' mean scores. The average scores of both classes were compared in order to determine which group performed better, as shown in the Table 5.

**Table 5.** Output of Mean Values between groups

| Classes | N | Red | Std. Deviation |
|---|---|---|---|
| Controls | 30 | 4.9 | 1.564 |
| Experiments | 30 | 7.5 | 1.814 |

The experimental class's much higher mean score of 7.5 compared to the control class's 4.9 is shown in Table 5, indicating the beneficial effect of the digital book on student learning results. Additionally, the findings of the survey showed that all students agreed that the digital book is a useful learning tool for the scientific writing course and that it effectively improves comprehension.

### 3.2 Discussion

While the Mendeley application offers high efficiency in reference management, its effective use requires a certain level of technical digital literacy. Common issues such as Microsoft Word plugin synchronization failures, errors in automatic document metadata entry, and confusion regarding citation style formats (e.g., APA, MLA, or IEEE) often lead to technical frustrations that hinder the completion of scholarly work (Jaya, 2025). An interactive digital book featuring video tutorials has been specifically designed to bridge this digital literacy gap by providing contextual support, as highlighted by previous researchers (Amalia et al., 2026). This flexible, self-paced learning approach gradually builds students' confidence in managing scholarly documents (Rohman, 2023). The implementation of this interactive digital book has brought about a transformative shift in the study habits of students at the Bali State Polytechnic. The interactive medium fosters self-regulated learning, allowing vocational students to review and practice technical instructions for using Mendeley at their own pace, without being constrained by the time limits of face-to-face guidance sessions.

Furthermore, the use of this medium directly contributes to standardizing the quality of scholarly references used by students (Rakhman, 2021). Through structured video tutorial guidance, students are trained to conduct literature searches in reputable databases such as Google Scholar, SINTA, or ScienceDirect and systematically import

the resulting metadata into their Mendeley digital libraries (Amalia et al., 2026). This process fundamentally enhances the credibility and citation accuracy of the resulting scholarly papers. For course instructors and final project supervisors, students' independent mastery of Mendeley improves the efficiency of academic guidance; this allows consultation sessions to focus on strengthening the research's substance, methodology, and novelty, rather than on correcting technical errors in bibliography formatting. This supports previous research conducted by (Rohman, 2023), in which digital books were able to help students develop a deeper understanding of the material being taught, making digital books very effective as a learning medium. The final stage of this research is socialization and discussion about the application of digital books into the lecture class of scientific writing courses.

## 4 Conclusion

The interactive digital book based on Mendeley's video tutorials for learning scientific writing at the Bali State Polytechnic (PNB) Hotel Operation Study Program has been successfully developed using an appropriate development model and thru the validation test stage, according to the findings of the research and development that has been conducted. Due to positive feedback from students and positive evaluations from media and material specialists, the final product is deemed appropriate for use as a teaching tool. Furthermore, it has been demonstrated that this interactive digital book can improve students' comprehension of how to utilize the Mendeley tool for writing scientific papers, particularly with regard to managing references and citations. Thus, this learning media is effectively used to support the scientific writing learning process and can be an alternative source of independent learning for PNB Hotel Operation Study Program students.

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