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What can we learn from one-to-one trials in Instructional design? A case from module development

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Abstract: The one-to-one trial phase within the instructional design development model has frequently been neglected in prior research. This stage should provide much in-depth insight considering its nature, which is in-depth face-to-face data collection between designers and participants. In this study, we aim to analyze a particular instance of module development during the one-to-one trial phase. This study is part of the media development stage with the ADDIE model (Analyze, Design, Develop, Implement, and Evaluate) at the implementation stage. We used quantitative data collection through scoring and qualitative data through interviews with six participants involved in the one-to-one trial. The findings revealed that students provided critical feedback on two aspects of the module, particularly its design appeal and suitability for independent learning, aligning with an average participant score of 3 on a 1-5 scale. These results provide an overview that one-to-one as a foundation and initiation for a broader trial plays an essential role in providing a starting point for an implementation where quantitative and qualitative data provide holistic insight.

Keywords: ADDIE; instructional design; module; one-to-one trial

1. Introduction

Instructional design development research is highly prevalent in the context of education in Indonesia (Rahardjanto & Husamah, 2022; Rahmadi & Lavicza, 2021). The trend of this research in many systematic literature reviews (Rahardjanto & Husamah, 2022; Rahmadi & Lavicza, 2021), meta-analysis (Alimah et al., 2018; Nurhayat et al., 2023) , and bibliometric analysis (Deda & Disnawati, 2024; Supriyadi et al., 2023) shows that this trend is well-developed in Indonesia. The models used also vary from the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) model (Branch, 2009), 4-D (Define, Design, Develop, and Disseminate) model (Thiagarajan, 1974), Borg and Gall Model (Borg & Gall, 1984), Dick and Carey Model (Dick et al., 2005), Kemp model (Kemp et al., 1998) and other development models. However, in the context of instructional design development, most papers tend to discuss the development results that emphasize small-scale tests or field tests (Fahrurrozi & Mohzana, 2022; Hafizhah & Istyadji, 2022); the earlier phase, known as the one-to-one trial, is often overlooked.

One-to-one trials are one of the formative evaluations of instructional design (Boston, 2019; Branch, 2009). They generally focus on the initial steps to reduce errors in instructional design and aim to find out how clearly users can accept the content (Branch, 2009). Unlike small-scale and field tests that require a large number of participants, one-

to-one tests require at least a few people, and the trial process is carried out one by one, allowing for more personalized interaction (Branch, 2009).

Although it is an early part of formative evaluation in instructional design development, one-to-one can provide an in-depth picture of instructional design (Boston, 2019; Branch, 2009). This is because of the nature of its implementation, where the designer sits with individuals and gets feedback from participants (Branch, 2009). The data, although it can be obtained quantitatively and qualitatively, is more directed towards qualitative (Branch, 2009).

In this paper, we exemplify the results of one-to-one trials conducted during the development of an instructional design module. The trials focus on providing feedback on how readable the module is in individual use. Moreover, the results provide an overview of how important the one-to-one trial in the process of instructional design. The results highlight the strengths and weaknesses of the module to be improved through revisions in the next trial stage. In the discussion section, we also provide some insights into what we got in the one-to-one trial that can help other designers or researchers develop instructional design further. It is to help instructional designers understand the practical implications of one-to-one trials and to help avoid potential pitfalls that may occur in designing instructional designs.

Module development as one part of instructional design is based on the need for systematic and organized learning media (Kristanto et al., 2018; Nurhikmah et al., 2021). In many studies that develop modules, the main highlight of the purpose of module development is based on learning media that has a nature as enrichment and can be used independently (Nurhasnah et al., 2020; Serrat et al., 2014). On the other hand, modules are used as guidelines in the continuous and contextual teaching process (Dewi & Primayana, 2019; Uslima et al., 2018). In this study, the one-to-one trials serve as a crucial starting point, offering initial feedback that will inform and guide future development efforts. So, this study aims to present the results of a one-to-one trial conducted during the development of a learning module and to accumulate valuable insights from this trial.

2. Materials and Methods

2.1 Context of the study

This paper represents one of the broad parts of our learning module development. We adopted the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) model (Branch, 2009), and this study is part of the implementation stage that focuses on one-to-one trials. So, this study focuses on examining the participants' perspectives on the developed module.

2.2 Participants

Six elementary school students participated in the one-to-one trial. The participants were selected by purposive sampling based on considerations (Campbell et al., 2020). These considerations included how capable students are in providing input and their familiarity with the learning module media.

2.3 Context of the Learning Module

The learning module developed (Figure 1) and tested during the one-to-one trial is a STEAM (Science, Technology, Engineering, Arts, and Mathematics) based module centred on the WASAKA character (*Waja sampai Kaputing*). WASAKA, a cultural principle from South Kalimantan, translates to "striving until the end" in the Banjar language (Putra et al., 2021; Sarbaini et al., 2012). This principle encompasses several values, with five fundamental values emphasized in this module: perseverance (linked to critical thinking),

religious commitment, independence, responsibility and resilience. These values also play a crucial role in the development of the instrumentation used during the one-to-one trial.

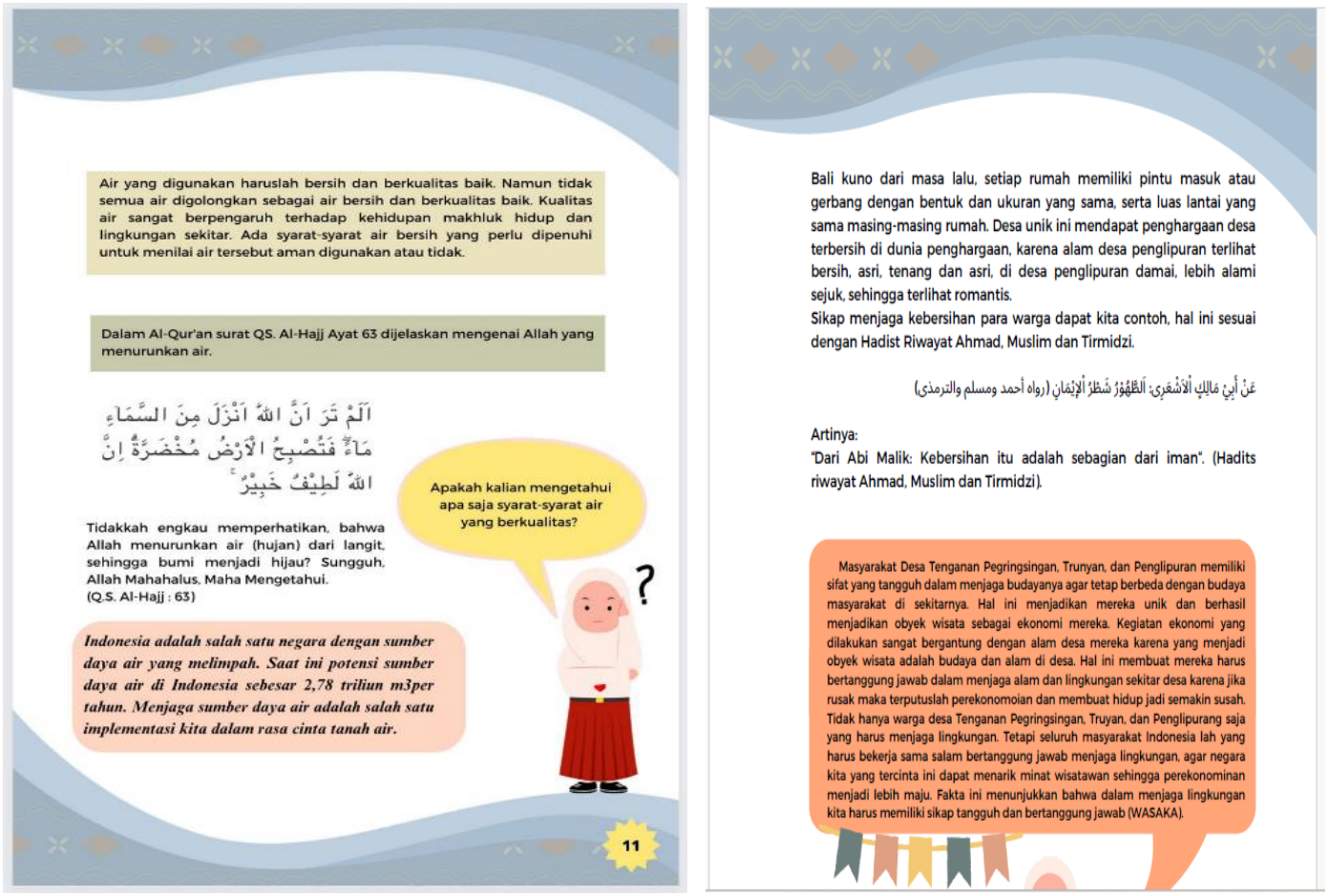

Figure 1. Example of module design and content

2.4 Instrumentation

The study employed a mixed-method approach (Schoonenboom, 2023) to gather perceptions of the developed module, combining quantitative and qualitative data collection. Students were first asked to rate statements on a 1-5 scale, which was then followed by in-depth interviews. The interview questions, detailed in Table 1, were designed to assess various indicators such as content readability, design appeal, cultural relevance, and character representation. The module integrates Indonesian culture and the WASAKA character education, which are key factors influencing the indicators used in the instrumentation.

Table 1. Indicators and interview questions in one-to-one trials

Indicators	Interview questions
Readibility content	• On a scale of 1-5, how easy do you find it to understand the content of this module? Are there any sections you find unclear?
Design appeal	• On a scale of 1-5, how appealing do you find the design of this module? What aspects of the design do you think could be improved?
Cultural relevance	• On a scale of 1-5, how relevant is the module's content to your local culture? Do you feel it accurately represents the culture around you?

Indicators	Interview questions
Character Representation	• On a scale of 1-5, how much does this module encourage critical thinking? Does the content effectively promote critical thinking? • On a scale of 1-5, how well does this module incorporate religious context? Does it effectively convey religious values? • On a scale of 1-5, how effective is this module in supporting independent learning? Do the assignments help you learn independently? • On a scale of 1-5, how well does this module encourage responsibility? Do the assignments promote a sense of responsibility? • On a scale of 1-5, how well does the module represent the values of resilience and perseverance? Does it inspire you to apply these qualities when completing the assignments?

2.5 Data Analysis

This study employs two distinct types of data analysis based on the nature of the data collected. For the quantitative data derived from students' ratings on a 1-5 scale, we conducted a quantitative descriptive analysis to examine the distribution of scores for each question (Siedlecki, 2020). The results are then presented using a stacked bar chart for clear visualization.

For the qualitative data, we utilized thematic analysis following the framework outlined by (Braun & Clarke, 2012). The process began with verbatim transcription of the interview data, followed by data familiarization through thorough reading and re-reading of the transcripts. Next, initial codes were generated and mapped from the transcripts. These codes were then grouped into potential themes, which were reviewed and refined. Finally, the themes were defined and named, culminating in a visual representation of the identified themes in the results section of this study.

3. Results

This section is divided into two parts. The first part presents a descriptive analysis of the quantitative data, while the second part focuses on the thematic analysis of the qualitative data.

3.1 Quantitative Analysis of Student Perspectives on the Learning Module

The data in this study focused on eight aspects of the four indicators mentioned earlier in the method section. Quantitatively, students gave a score of 1-5 for each aspect, and in Table 2, the frequency for each score is focused so that it can be seen how many students gave a score for each aspect. Overall, a score of 4 was dominantly chosen by students, and then a score of 3. A small number of students chose a score of 5

Figure 2 details the results for the four indicators, spread across eight aspects. Students' ratings for each aspect mostly range between 3 and 5, with point 4 being the most common score in five aspects: content readability, cultural relevance, critical thinking, religious context, and resilience. However, point 3 is the dominant score for two aspects: design appeal and independent aspect.

The scoring provided by participants for each aspect served as the initial step, guiding subsequent interviews with students to gain a deeper qualitative understanding of their perceptions and the reasons behind the scores they assigned to the module.

3.2 Qualitative Student Perspectives on the Module

Following the assessment, students were asked to explain their reasons for the scores they gave to each aspect. We then conducted a thematic analysis of the interview responses to capture how students perceived the module. For each identified sub-theme, we included representative examples from the interviews, as shown in Table 2. The overall themes were organized according to the seven aspects explored during the interviews.

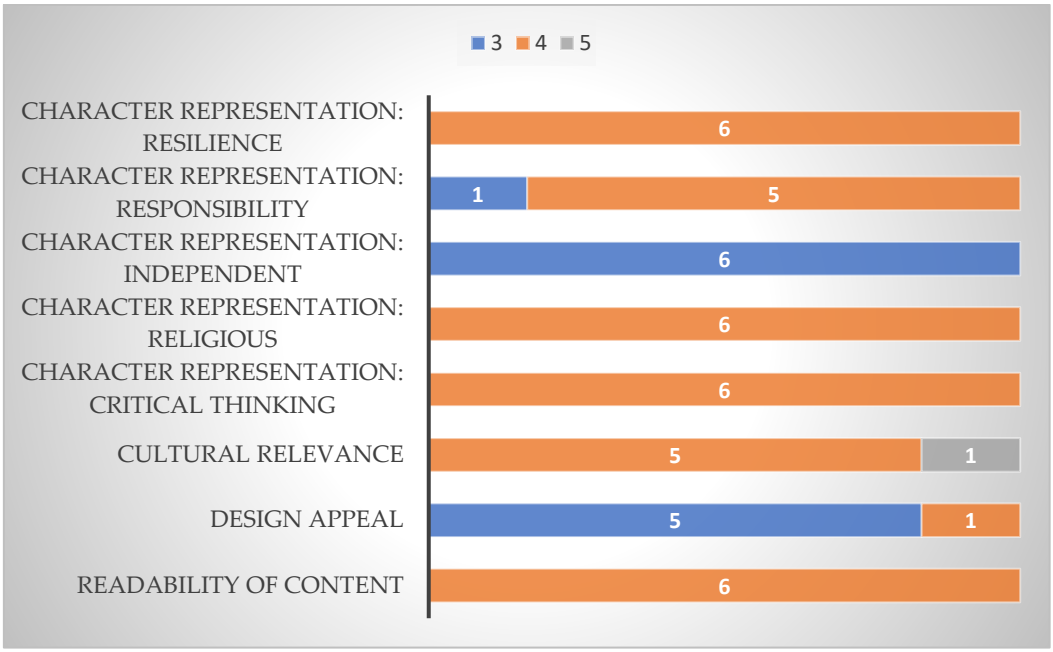

Figure 2. Distribution of score based on one-to-one trials

Table 2. Themes, sub-themes, and representational transcripts

No	Themes	Sub-Themes	Reprentational transcripts
1	Readibility	Use of clear language	*The use of language in the module is very easy to understand so that I can understand the module well -student 3*
		Organized information	*The contents of the module are easy to follow, I understand and easy to follow - student 1*
2	Design appeal	Enhancing module's elements	*The design needs to be added a little color to make it more interesting to read - student 4*
		Motivation in reading	*The appearance of the module makes me want to read it, because it is interesting - student 2*
3	Cultural relevance		*In the module there is also an introduction to culture, such as dances, and other cultures around us - student 1*
4	Critical thinking	Creating significant challenges	*The tasks in the module are quite difficult, but challenging for me to think - student 6*
		Encouraging active learning	*The task activities in the module can help students to be more active in class - student 4*
5	Religious		*There are sections such as excerpts from the Qur'an so that there are religious values in this module - student 1*

No	Themes	Sub-Themes	Reprentational transcripts
6	Independent		*I personally might have a little difficulty in using the module independently, because I still need direction from the teacher - student 2*
7	Responsibility		*The module makes me learn to be responsible for my work, this is also in the module in each task to do tasks responsibly -student 6*
8	Resilience		*Some words in the module insert messages not to give up easily - student 2*

In the thematic analysis of participant interviews, we identified specific themes by mapping relevant transcript excerpts. We highlighted certain portions of the transcripts in blue to indicate student criticisms of the module. Transcripts without these highlights generally had a neutral tone or were supportive of the module's content.

Upon further review, the themes containing criticism often corresponded with lower quantitative scores. For instance, in the "design appeal" theme, students expressed dissatisfaction with the module's design, which aligns with the quantitative data where many students rated this aspect with a score of 3. Similarly, the theme of "independent aspect" was criticized, as students found it challenging to learn independently using the module, reflected in an overall score of 3. In contrast, other themes showed positive or neutral student perceptions, consistent with higher scores, typically around 4.

4. Discussion

This discussion focuses on the critical role of one-to-one trials in the instructional design development process. First, we examine how the quantitative assessments provided by student scoring align with the qualitative data from interviews. Second, we consider the potential impact of one-to-one trials on module development.

4.1 Alignment of Quantitative and Qualitative Data in One-to-One Trials

In mixed-method research, quantitative and qualitative data are often interrelated and complementary (Dawadi et al., 2021; Schoonenboom, 2023), as observed in this study. The relationship between students' scores and their interview responses is evident. For example, in aspects like design appeal and independent learning, where most students were assigned a score of 3, their interview feedback also reflected criticisms of these aspects. Conversely, in aspects where students mostly gave a score of 4, their opinions were generally positive or neutral.

As part of the module's future development, the planned solution to enhance its design appeal involves incorporating visual elements tailored to elementary school students, such as appropriate colour schemes and icons, as highlighted in various studies (Laeeque & Akmal, 2017; Mehta & Zhu, 2009). For the independent learning context, we intend to include more detailed guidance for assignments using language that students easily understand. In several studies, it has been reported that clear guidelines in module creation are important so that the module can be used independently (Kho et al., 2014; Suryani et al., 2021). Given the module's focus on promoting independent learning, this aspect will be a key consideration in future revisions.

Studies that incorporate both quantitative and qualitative data emphasize the importance of using these complementary methods to obtain more holistic and reliable results (Hands, 2022; Love et al., 2023; Verhoef & Casebeer, 1997). In Indonesia, instructional design research has traditionally relied heavily on quantitative data from questionnaires (Anjarwati et al., 2023), which may not fully capture the complexities needed for effective instructional design revisions. On the other hand, studies focusing on qualitative data often provide richer details for refining instructional media (Abrori et al.,

2023). In this context, the integration of both types of assessments in our study is essential, as they provide mutual support and deeper insights.

The one-to-one trial stage, as implemented in practice, comes with certain constraints, which were also uncovered in this study. Key challenges we obeyed include subjectivity, bias risk, and the limited context of interaction. Similar issues have been highlighted in previous research, such as (Louto et al., 2023), who mentioned the potential for bias in educational settings. Subjectivity arises when individual experiences and preferences shape feedback, which may not fully align with the needs of a broader audience (Adeoye et al., 2024). Another challenge is the risk of bias, where participant feedback may be impacted by their perception of the designer's expectations during media introduction (Crompton et al., 2024). Lastly, the limited interaction context refers to trial conditions that are often less realistic than actual classroom environments, which can impact the relevance of participant feedback (Mutlu, 2016; Spatioti et al., 2022).

In a nutshell, the one-to-one trial phase, which emphasizes in-depth interactions between designers and participants, offers a valuable opportunity for comprehensive data collection through both quantitative and qualitative methods. Although it may seem like a small initial step in the implementation process, effective data collection at this stage can significantly enhance its overall importance and impact.

4.2 Impact of one-to-one trial in module development as instructional design

Many studies related to instructional design development (both learning design and learning media) highlight implementation in a broader context, such as small-scale tests or field tests (Fahrurrozi & Mohzana, 2022; Hafizhah & Istyadji, 2022). Very rarely do they highlight the one-to-one trial section. It is "possibly" due to the lack of input in this section to be used as a basis for the instructional design revision process (in our presumption as authors, due to the lack of data in previous studies).

Numerous scholars highlight the role of one-to-one trials in instructional design as a critical foundation for implementation, serving as a catalyst for early refinements to prototypes, whether they involve instructional models or learning media (Basu, 2018; Ozdilek & Robeck, 2009). In responding to this, we highlight this as an "opportunity" to maximize this stage so that we get a lot of valuable data from the participants involved. When associated with the results, the participants' criticism of the module that we developed, the design appeal and the context of independence became material for us to improve the module. From this, we revised the appearance of the module design based on this input, as well as reevaluated the tasks in the module so that the module was more adaptable for use as an independent learning medium.

Then, *what is the impact of the one-to-one trial?* From the context of this study, one-to-one trials provide an opportunity for authors to obtain in-depth data from participants regarding their perceptions of the module. It cannot be obtained in a broader scope in small-scale trials or field trials that have many participants. From in-depth data collection, a broader exploration can be carried out regarding things that need to be revised in the module.

So, *what are the weaknesses of one-to-one trials?* If noticed from this study, of course, has a limited number of participants, the data obtained may not be generalizable, which also allows data from one-to-one trials to be different in broader implementations. As outlined in the materials and method section, this study involved six participants. Their selection was based on specific criteria, particularly their experience with the module, ensuring that all participants were sufficiently familiar with it and demonstrated academic achievement. Choosing well-qualified participants is crucial for making the trial phase meaningful, as it allows for comprehensive feedback and constructive critique of the design (Peterson, 2003).

In brief, in the context of this study, one-to-one trials provide an initial picture for insight into the next stage. Even though there are limitations in participant limitations,

one-to-one can be used as a basis for initial revisions for modules to be implemented in broader trials.

5. Conclusion

In conclusion, this study provides an in-depth examination of the one-to-one trial stage within the instructional design process, specifically focusing on module development. The quantitative and qualitative data collected are interconnected, with participants generally expressing positive perceptions of most aspects during interviews, except for two areas: design appeal and the context of independent learning. While the one-to-one trials in this study have limitations due to their non-generalizability, the authors hope this research will inspire designers and researchers in instructional design to place greater emphasis on one-to-one trials in their work.

Authors Contribution: Muhsinah Annisa, Fadhlan Muchlas Abrori: methodology, conducting the research and writing original article, field data collection, data analysis, and revision. Dasim Budimansyah, Mupid Hidayat, Atiek Winarti: data analysis, and revision.

Conflict of Interest: The authors declare no conflict of interest.

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