Designing Interactive E-Modules Through Journal Writing to Enhance Mathematics Pre-Service Teachers' Questioning Skill

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ABSTRAK

Permasalahan dalam penelitian ini didasari oleh kurangnya keterampilan bertanya mahasiswa calon guru. Mahasiswa calon guru cenderung belum memiliki pengetahuan dan keterampilan yang komprehensif dalam mengajukan pertanyaan yang efektif. Hal ini dapat diketahui dari kecenderungan mahasiswa dalam mengajukan pertanyaan tertutup, yang mengindikasikan rendahnya kualitas keterampilan bertanya. Oleh karena itu, perlu dikembangkan suatu e-modul interaktif yang terintegrasi dengan kegiatan *journal writing* untuk meningkatkan keterampilan bertanya mahasiswa. Penelitian ini bertujuan untuk mengembangkan e-modul interaktif berbasis *journal writing* untuk meningkatkan kualitas keterampilan bertanya mahasiswa serta mengetahui kualitas dari e-modul tersebut dengan mempertimbangkan tiga aspek yaitu kevalidan, kepraktisan, dan keefektifan. Jenis penelitian ini adalah Research *and Development* (R & D) dengan menggunakan model 4D (*Define, Design, Develop, Dessiminate*). Adapun rata-rata skor kevalidan dari dua ahli materi dan dua ahli media secara berturut-turut ialah 4,78 dan 4,65 yang termasuk kategori sangat baik. Selanjutnya, kepraktisan dan keefektifan e-modul berdasarkan hasil angket respons mahasiswa secara berturut-turut memiliki rata-rata 84% (praktis) dan 85% (sangat efektif). Hasil dari ketrampilan bertanya menunjukkan adanya peningkatan jumlah pertanyaan terbuka yang diajukan oleh mahasiswa seiring dengan semakin berkurangnya jumlah pertanyaan tertutup yang diajukan oleh mahasiswa. Dengan demikian, e-modul interaktif berbasis *journal writing* telah memenuhi kriteria valid, praktis, dan efektif untuk digunakan dalam kegiatan pembelajaran Telaah Matematika SMP pada konten bilangan dan himpunan dan dapat meningkatkan keterampilan bertanya mahasiswa.

Kata kunci: E-Modul, *Journal Writing*, Keterampilan Bertanya.

ABSTRACT

This research was driven by the lack of questioning skills among pre-service teachers. Pre-service teachers tend to lack comprehensive knowledge and skills in asking effective questions. This can be seen from their tendency to ask closed-ended questions, indicating a low quality of questioning skills. Therefore, it is necessary to develop an interactive e-module integrated with journal-writing activities to improve students' questioning skills. This study aims to develop an interactive e-module based on journal writing to improve the quality of pre-service teachers' questioning skills and to determine the quality of the e-module by considering three aspects: validity, practicality, and effectiveness. This research is a Research and Development (R&D) study using the 4D model (Define, Design, Develop, Disseminate). The average validity scores from two material experts and two media experts were 4.78 and 4.65, respectively, which fall into the very good category. Furthermore, the practicality and effectiveness of the e-module based on the results of student response questionnaires were 84% (practical) and 85% (very effective), respectively. The results of questioning skills showed an increase in the number of open-ended questions asked by students, along with a decrease in the number of closed-ended questions asked by students. Thus, the interactive e-module based on journal writing has met the criteria of being valid, practical, and effective for use in learning activities of Junior High School Mathematics Studies on the content of numbers and sets and can improve students' questioning skills.

Keywords: E-Modul, Journal Writing, Questioning Skill.

INTRODUCTION

A frequent challenge pre-service mathematics teachers encounter is their restricted capacity to pose questions. These students often exhibit an incomplete grasp of questioning techniques. This limitation arises from the fact that, prior to student teaching, their experience in instruction and inquiry is rooted in their personal experiences as classroom learners (Lortie, 2020; Kaunang et al., 2023). Consequently, some pre-service teachers have yet to acquire the requisite knowledge and abilities to pose meaningful questions and cultivate a supportive learning atmosphere for their pupils.

The ability to ask questions is a cornerstone of effective teaching. Teachers spend nearly half of their classroom time engaged in questioning (Cotton, 1988). Hence, it is common for teachers to pose over 300 questions in a single school day (Floyd, 1960; Levin & Long, 1981). This indicates that questioning is one of the most frequently used teaching strategies in the classroom (Ainscow, 2000; Hamidah et al., 2022). Teachers' questioning techniques and responses impact the learning process, learning outcomes, and the development of students' thinking skills (Mauigoa, 2006). In other words, the strategies employed by teachers in asking and answering questions can significantly influence students' cognitive development, academic achievement, and critical thinking skills.

Although questioning skills are a crucial component of teaching and learning, previous studies have revealed that most pre-service teachers tend to ask closed-ended questions rather than open-ended ones, suggesting that they possess a relatively low level of questioning skills (Coutinho & Almeida, 2014; Nurramadhani, 2019). The results of this study align with the research of Aminah et al. (2017), which stated that pre-service mathematics teachers tend to pose more basic-level questions than higher-level ones. This indicates that pre-service teachers have not yet maximized their cognitive abilities in constructing questions. Therefore, an activity is needed to enhance students' questioning skills.

A potential strategy to enhance students' questioning abilities is journal writing. This involves students expressing their thoughts about a given topic spontaneously or in response to specific prompts. A journal is a personal record where students can reflect on their mathematical learning experiences (Borasi & Rose, 1989). Regarding the term 'journal writing', this study will focus on developing it as a reflective tool for students to explore their questions rather than as a general platform for expressing thoughts.

In the Junior High School Mathematics Review course, journal writing serves as a bridge between the taught material and student understanding. By writing questions and reflections about mathematical concepts, students can improve their questioning skills, which are essential in learning. This activity also creates an inclusive environment where students can freely express their thoughts and questions without pressure. Additionally, journal writing helps instructors identify students' needs and challenges by understanding everyone's perspective and level of understanding. This information is useful in tailoring teaching approaches to suit students' needs and interests better. In conclusion, journal writing is a powerful tool for enhancing mathematics learning and preparing future mathematics educators. An interactive e-module will be developed to facilitate this process, specifically designed to guide students in refining their questioning abilities. This e-module will incorporate a core topic from the Junior High School Mathematics Review course: Numbers and Sets. The rationale behind choosing this topic lies in its foundational role for other mathematical concepts that pre-service teachers must grasp to teach at the secondary level effectively.

An e-module is an electronic document formatted to offer a variety of advantages (Solikin, 2018; Sugihartini et al., 2017). An interactive e-module, on the other hand, is a learning resource that presents content, methodologies, boundaries, and assessment strategies systematically and engagingly to facilitate the attainment of specific competencies (Imansari & Sunaryantiningsih, 2017). This interactive e-module will be developed using the book creator website, which offers a variety of attractive features that can facilitate the creation of e-modules. Given the problem described the research problem is to investigate the process and outcomes of developing an interactive e-module that incorporates journal writing for the junior high school mathematics review course.

Recent research on journal writing has shown that journal writing provides various positive outcomes for pre-service teachers. Journal writing can help students engage in reflective thinking, thereby fostering a positive attitude toward mathematics (McNaught, 2010). Journal writing offers students a valuable tool for assessing their mathematical understanding (Kenney et al., 2014). Students who have engaged in journal writing are more likely to develop reflective practices in their learning (Cavanagh & Garvey, 2012). Journal writing can reveal students' ideas and perspectives, linking them to prior knowledge and experiences, thus fostering self-questioning (Guce, 2017). Given the presence of self-questioning in journal writing, it can be inferred that this activity effectively develops questioning skills. Since there are no existing studies on developing modules based on journal writing, this research aims to fill this gap by creating an interactive e-module that leverages journal writing to improve students' questioning abilities.

This study seeks to develop and evaluate an interactive e-module that integrates journal writing for teaching numbers and sets in the Junior High School Mathematics Review course. The e-module will be assessed based on its validity, practicality, and effectiveness. Canva will be utilized to create visual elements, and the book creator website will serve as the development platform. This study aimed to address two primary research questions. First, it explored the process of developing an interactive e-module that integrated journal writing for teaching numbers and sets in a junior high school mathematics review course. Second, it sought to assess the quality of the developed e-module regarding its validity, practicality, and effectiveness.

METHOD

This research is a Research and Development (R&D) study aimed at developing an interactive e-module based on journal writing for the content of numbers and sets in the Junior High School Mathematics Review course. The R&D method will be employed to produce the e-module and evaluate its effectiveness (Sugiyono, 2019). This study adopts the 4D model, a developmental framework proposed by Thiagarajan and Semmel in 1974. This model comprises four phases: definition, design, development, and dissemination. The initial phase, definition, involves conducting analyses such as examining questioning skills, student characteristics, junior high school mathematics review content, and identifying reflections on questioning skills. Additionally, task and concept analyses are conducted to establish specific learning objectives. The design phase entails establishing criteria, selecting media, determining the format and layout of the e-module, and developing pre-trial materials such as lesson plans and assessment instruments. Subsequently, the development phase involves creating the interactive e-module and obtaining expert validation. Finally, the dissemination phase will focus on conducting a larger-scale trial to evaluate the e-module's effectiveness.

RESULT AND DISCUSSION

The outcome of this development research is an interactive e-module on numbers and sets for junior high school mathematics review courses based on journal writing. Through this e-module, students are expected to enhance one of their pedagogical competencies, namely questioning skills. This development research employed the 4D model, consisting of four stages: define, design, develop, and disseminate.

1. Define

In this phase, an analysis was conducted concerning the problems encountered in the Junior High School Mathematics Review course. One identified problem was pre-service mathematics teachers' lack of questioning skills during lectures. Consequently, an analysis was conducted on the students' questioning skills. The analysis results revealed that students tended to pose closed-ended questions, which are categorized as low-level questioning skills (based on students' responses). Closed-ended questions are those that elicit a single, specific correct answer (Pate, 2012). These questions tend to focus on factual or procedural knowledge. According to Coutinho

& Almeida (2014), closed-ended questions often begin with words like "what," "where," and "which." In the observed classroom setting, students frequently initiated their questions with terms such as "what," "determine," and "find," indicating a preference for questions demanding a specific, singular answer. Based on the analysis of the problem, it can be inferred that students' tendency to ask closed-ended questions aligns with their characteristic of having relatively low critical thinking abilities. Previous studies have shown a strong correlation between critical thinking and communication skills (Choi & Kim, 2007; Noor & Ranti, 2019), suggesting that individuals with strong communication skills tend to possess higher levels of critical thinking. Therefore, students' written communication can be enhanced through journal writing to improve their oral communication, particularly questioning skills. Subsequently, the content of the Junior High School Mathematics Review course was identified to determine the appropriate material for developing a journal-writing-based e-module. Based on the content identification, it was decided that the e-module would be developed on the content of numbers and sets, considering that this is a fundamental topic studied by students in the Junior High School Mathematics Review course. Subsequently, the desired learning outcomes for the module were defined. Students are expected to develop a profound understanding of number concepts, demonstrate the ability to effectively teach these concepts to junior high school students, and enhance their questioning skills within the context of mathematics instruction. To achieve these outcomes, the e-module was designed to incorporate tasks that promote the expression of opinions, perceptions, and reflections, as well as activities that foster exploration, problem-solving, and question formulation.

2. Design

At this stage, various essential elements were assembled to ensure the effectiveness and efficiency of the learning process. The e-module criteria were developed based on the desired end competencies, student characteristics, and content material obtained from the defining stage. The selected medium for designing the interactive e-module was a digital multimedia book creation website application, namely Book Creator. The selection of this application was based on the advantages offered by Book Creator's features, such as integrating text, audio, video, images, forms, and other content into a digital book. Previous studies have also demonstrated the role and effectiveness of this application in enhancing one's writing abilities (Afiyattena & Pravitasari, 2022; Evi, 2022; Kusumawati, 2022; Maharani & Santosa, 2021). Subsequently, illustrations were designed using Canva and integrated into the e-module's format and layout. Canva is a graphic design platform that assists users in creating visually appealing and creative designs (Dadi, 2023; Kharissidqi & Firmansyah, 2022; Rahmawati & Atmojo, 2021). The selection of Canva to support the illustrations in the e-module layout was based on considering the diverse features available on Canva that can facilitate users in creating graphic designs and customizing templates with various fonts and visual effects. Furthermore, before the trial, preparatory activities were arranged, including developing a Semester Learning Plan (SLP) and research instruments. The Semester Learning Plan (SLP) was developed to guide the learning process and establish indicators to measure the achievement of the planned end competencies. Research instruments were designed to collect data for the study. These instruments play a crucial role in determining the quality of a study, as the validity or accuracy of the data obtained will be highly dependent on the quality of the instruments used, in addition to the data collection procedures. All these designs were implemented to ensure consistency and coherence between the development elements, thereby effectively achieving the planned end competencies.

3. Develop

The current research phase focuses on developing an interactive e-module incorporating journal writing as a pedagogical tool. As depicted in **Figure 1**, the implementation team is actively engaged in creating this module. The initial step in this process involved the development of a printed module that adheres to the journal writing framework outlined in the 2021 teaching materials guidelines of the Muhammadiyah University of Jember. The printed module was then transformed into an interactive, journal-writing-based e-module using the versatile platforms of Book Creator and Canva. This digital format ensures that the module is accessible from any location. Upon completion, the e-module will be subjected to expert validation to ascertain its quality and suitability for instructional purposes.
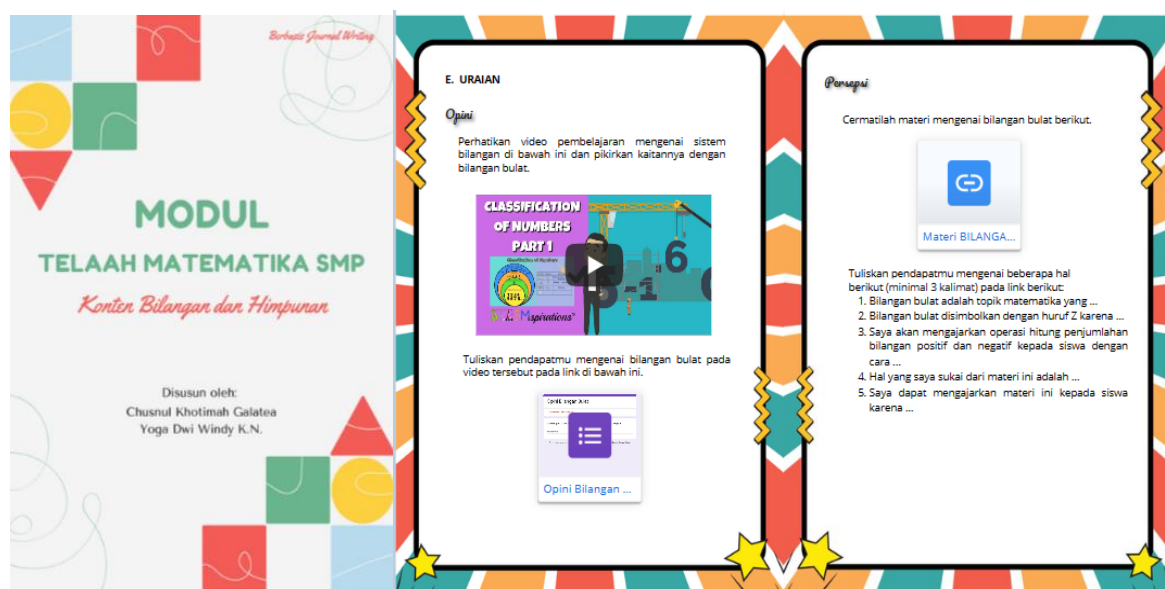
Figure 1. Junior High School Mathematics Review Course E-Modul Based on Journal Writing

The validation process was implemented to verify that the module's content and materials were consistent with the established learning objectives and criteria. Two mathematics education experts assessed the content to ensure a comprehensive evaluation, while two others with expertise in educational media evaluated the module's design. The validation instrument for the content experts included criteria such as self-instruction, self-contained, stand-alone, adaptive, dan user-friendly. Each aspect was evaluated based on several related statements, each receiving a score between 4 and 5. This indicates a high level of validation from the experts. The results of the content expert validation showed that the total average score for all aspects was 4.78, which is categorized as valid. This demonstrates that the material has been comprehensively validated and is suitable for use based on the expert assessment.

Furthermore, the media expert validation sheet included module size, cover design, content design, and application indicators. The criteria for determining the validity of the materials and media in the developed e-module consisted of a five-point Likert scale: 1 = not valid, 2 = less valid, 3 = fairly valid, 4 = valid, and 5 = very valid. The validation results culminated in a conclusion regarding the validity of the developed e-module for pilot testing with students and as a basis for revisions or improvements. The media experts' validation yielded a score of 4.65, falling within the 'valid' category. Consequently, based on both the content and media validation results, the junior high school mathematics e-module on numbers and sets incorporating journal writing was deemed valid for use. Furthermore, the content experts suggested minor revisions to the module, while the media experts deemed it suitable for use without any modifications. The suggested revisions by the content experts and their subsequent implementations are presented in **Table 1**.

Table 1. Revision of a Journal Writing-Based E-Module

No	Component Revised	Before Revision	Suggested Revision	After Revision
1.	Subheading		There is a mismatch between the subheading and the linked content, specifically in prompt question 12.	
2.	Subheading		There is a subheading that is not yet specific according to the linked content.	

4. Disseminate

This stage involved disseminating or implementing the interactive e-module in a real-world learning environment. All mathematics education students at the Muhammadiyah University of Jember enrolled in the Junior High School Mathematics Review course and served as research subjects. The study involved 13 students who took the course during the odd semester. In this phase, students were required to engage in a stepwise journal writing process, beginning with exploration activities, thought-provoking questions, and formulating their own inquiries. Following these activities, an evaluation was conducted through several stages: problem presentation, problem-solving, question formulation, and reflection. The results of the evaluation of students' questioning skills revealed a significant improvement compared to the learner analysis conducted during the define stage. **Figure 2** presents the results of students' questioning skills.
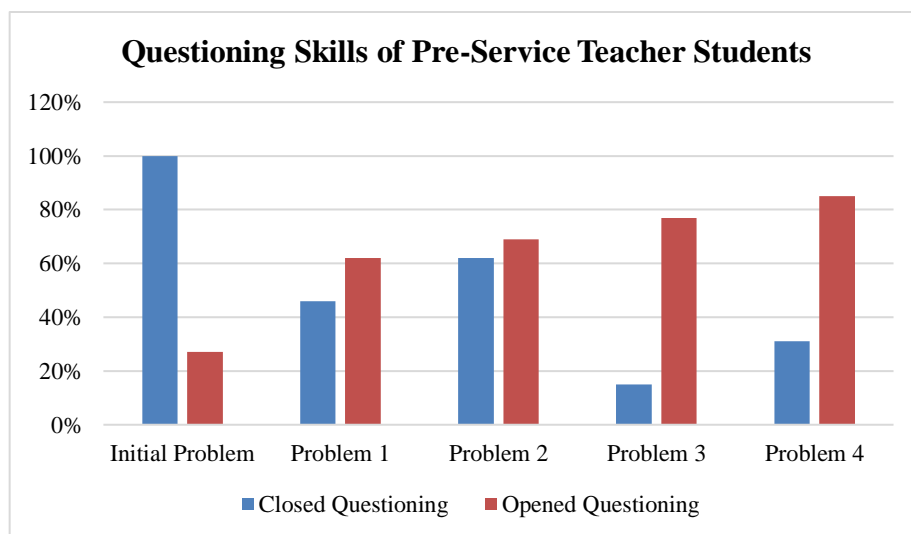
Figure 2. Bar Chart of Students' Questioning Skills

Figure 2 presents a bar graph depicting students' questioning skills categorized into closed and open questioning across several problems, ranging from the initial problem to problem 4. In the initial problem, all students posed closed-ended questions. Conversely, the proportion of open-ended questions was below 30%. For the first problem, a notable increase of approximately 60% was observed in the frequency of open-ended questions, signifying a significant shift towards a more exploratory inquiry approach among the students. Conversely, the proportion of closed-ended questions decreased by approximately 50%, indicating a reduction in the prevalence of questions seeking simple, direct answers. In the second problem, a balance was observed between closed-ended and open-ended questions, with both categories accounting for approximately 60% of the questions. This indicates a growing diversity in the types of questions posed by the students.

For Problem 3, students exhibited a strong preference for open-ended questions, with nearly 80% of students posing such inquiries. Conversely, closed-ended questions decreased significantly to approximately 10%, indicating a shift toward a more exploratory and critical thinking approach. In the final problem, Problem 4, the prevalence of open-ended questions remained high at around 80%, while closed-ended questions slightly increased to about 30%. This suggests that students had established a consistent pattern of using open-ended questions, promoting critical and exploratory thinking. The results indicate that students were increasingly inclined to ask open-ended questions, demonstrating a shift toward a deeper understanding of the subject matter. As the problem's complexity increased, a shift in questioning patterns was observed, with students increasingly posing open-ended questions. This reflects an enhancement in their critical thinking and exploratory abilities. Specifically, the dominance of open-ended questions in Problems 3 and 4 indicates that students had developed the capacity to ask questions that facilitate broader and deeper discussions. Students demonstrated an enhanced ability to identify areas requiring deeper understanding and tended to delve into more complex information. Upon completing the e-module, they exhibited a propensity for posing open-ended questions. Consequently, the findings of this research indicate an improvement in the quality of students' questions, shifting from a lower to a higher level. Additionally, the data showed a negative correlation between the number of open-ended and closed-ended questions asked by students.

After completing the module and the questioning skills assessment, a questionnaire was administered to gather students' feedback on the practicality and effectiveness of the journal-writing-based e-module. The questionnaire consisted of 14 indicators, of which 8 assessed the module's practicality, and 6 evaluated its effectiveness. The average rating for practicality ranged from 3.1 to 3.5, resulting in an overall average practicality rating of 84%, which is categorized as good. The average rating for effectiveness ranged from 3.1 to 3.5, resulting in an overall average effectiveness rating of 85%, also categorized as good. These results indicate that the e-module was perceived as being of good quality regarding both practicality and effectiveness. However, there may be some aspects that could be improved to achieve a higher percentage. Therefore, these evaluation results can be considered when making decisions about the further use or development of this e-module.

CONCLUSION

This study demonstrates that developing an interactive journal-writing-based e-module effectively enhances pre-service teachers' questioning skills, particularly in posing open-ended questions. The e-module has met the validity, practicality, and effectiveness criteria based on expert evaluations and student feedback. The average validity score from both content and media experts was categorized as excellent, while the practicality and effectiveness of the e-module received scores of 84% and 85%, respectively. The increased use of open-ended questions and the decreased use of closed-ended questions demonstrate an improvement in students' questioning skills. Consequently, the e-module can be effectively implemented in Junior High School Mathematics instruction, particularly for the topics of numbers and sets.

Further research could focus on the advanced development of journal-writing-based e-modules, particularly by incorporating innovative features such as automated feedback that provides instant evaluation of students' journal quality. The development of this product could also include journal personalization tailored to the abilities and needs of each student, as well as the integration of data visualization to monitor the progression of their questioning skills. Furthermore, the e-module could be enhanced by incorporating gamification elements into journal writing, such as reward systems or badges, to boost motivation and increase student engagement in the reflective process and skill development. Implementing these features requires further testing to assess their impact on improving questioning skills and the module's effectiveness in various relevant contexts.

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REFERENCES

Afiyattena, N., & Pravitasari, H. (2022). Development of Grammar in Written Discourse E-Book with Multimodal Approach Using Book-Creator Application. *Wiralodra English Journal*, *6*(2), 64–81. https://doi.org/10.31943/wej.v612.183

Ainscow, M. (2000). The Next Step for Special Education: Supporting The Development Of Inclusive Practices. *British Journal of Special Education*, *27*, 76–80. https://doi.org/https://doi.org/10.1111/1467-8527.00164

Aminah, N., Kusuma Dewi, I. L., Pratiwi, D., & Santi, D. (2017). Keterampilan Bertanya dan Self Confidence Mahasiswa Pendidikan Matematika pada Mata Kuliah Pembelajaran Mikro. *Jurnal Nasional Pendidikan Matematika)*, *1*(1), 109–117. https://jurnal.ugj.ac.id/index.php/JNPM/article/view/258/193

Borasi, R., & Rose, B. J. (1989). Journal writing and mathematics instruction. *Educational Studies in Mathematics*, *20*(4), 347–365. https://doi.org/10.1007/BF00315606

Cavanagh, M. S., & Garvey, T. (2012). A Professional Experience Learning Community for Pre-service Secondary Mathematics Teachers. In *Australian Journal of Teacher Education* (Vol. 37). http://ro.ecu.au/ajte/vol37/iss12/7http://ro.ecu.au/ajte/vol37/iss12/7

Choi, E.-Y., & Kim, J.-Y. (2007). The Relationship of Core Competencies (Problem Solving Ability, Communication Ability, Self-Directed Learning Ability) to Critical Thinking. *Journal of Korean Academy of Fundamentals of Nursing*, *14*(4), 412–419. https://j.kafn.or.kr/m/journal/view.php?number=476

Cotton, K. (1988). *Monitoring Student Learning in The Classroom. School Improvement Research Series Close-Up #4.* https://eric.ed.gov/?id=ED298085

Coutinho, M. J., & Almeida, P. A. (2014). Promoting Student Questioning in the Learning of Natural Sciences. *Procedia - Social and Behavioral Sciences*, *116*, 3781–3785. https://doi.org/10.1016/j.sbspro.2014.01.841

Dadi. (2023). Pembelajaran Berbasis Visual dengan Quizizz dan Desain Grafis Canva. *Indonesian Journal of Innovation Multidisipliner Research*, *1*(4), 446–452. https://doi.org/https://doi.org/10.31004/ijim.v1i4.51

Evi, H. (2022). *The Influence Of Using Book Creator Application Toward Students' Writing Ability In Procedure Text* [UIN Raden Intan Lampung]. http://repository.radenintan.ac.id/id/eprint/21352

Floyd, W. D. (1960). *An Analysis of The Oral Questioning Activity in Selected Colorado Primary Classrooms*. University Microfilms.

Guce, I. K. (2017). Investigating College Students' Views on Mathematics Learning Through Reflective Journal Writing. *International Journal of Evaluation and Research in Education (IJERE)*, *6*(1), 38–44.

Hamidah, D., Gunawan, N. E., Widayati, W., & Hasanah, D. R. (2022). Peranan Watermelon Juice Cone dalam Memahami Konsep Matematis Materi Volume Bola dan Kerucut Melalui

Pendekatan PMRI. *MARISEKOLA: Jurnal Matematika Riset Edukasi dan Kolaborasi*, 3(2), 114-122. https://doi.org/10.53682/marisekola.v3i2.5353

Imansari, N., & Sunaryantiningsih, I. (2017). Pengaruh Penggunaan E-Modul Interaktif Terhadap Hasil Belajar Mahasiswa pada Materi Kesehatan dan Keselamatan Kerja. *VOLT : Jurnal Ilmiah Pendidikan Teknik Elektro*, 2(1), 11. https://doi.org/10.30870/volt.v2i1.1478

Kaunang, D. F., Sulangi, V. R., & Kamu, M. C. (2023). Development Learning Design of Linear Inequality of Two Variables with GeoGebra Classroom Assisted Discovery Learning Model. *MARISEKOLA: Jurnal Matematika Riset Edukasi dan Kolaborasi*, 4(2). https://doi.org/10.53682/marisekola.v4i2.8616

Kenney, R., Shoffner, M., & Norris, D. (2014). Reflecting on the Use of Writing to Promote Mathematical Learning: An Examination of Preservice Mathematics Teachers' Perspectives. *The Teacher Educator*, 49(1), 28–43. https://doi.org/10.1080/08878730.2013.848002

Kharissidqi, M. T., & Firmansyah, V. W. (2022). Aplikasi Canva Sebagai Media Pembelajaran Yang Efektif. *Indonesian Journal Of Education And Humanity*, 2(4), 108–113. http://ijoehm.rcipublisher.org/index.php/ijoehm/article/view/34

Kusumawati, N. A. (2022). Penggunaan Media E-Book Creator Untuk Meningkatkan Kemampuan Menulis Cerita Inspiratif Peserta Didik Kelas IX F SMP Negeri 1 Dayeuhkolot Kabupaten Bandung Semester Genap Tahun Pelajaran 2021-2022. *Continuous Education: Journal of Science and Research*, 3(3), 30–38. https://doi.org/10.51178/ce.v3i3.991

Levin, T., & Long, R. (1981). *Effective Instruction.* . Association for Supervision and Curriculum Development. https://eric.ed.gov/?id=ED200572

Lortie, D. C. (2020). *Schoolteacher: A Sociological Study*. University of Chicago Press.

Maharani, A. A. P., & Santosa, M. H. (2021). The Implementation Of Process Approach Combined With Screencast-O-Matic And Bookcreator To Improve Students' Argumentative Writing. *LLT Journal: Journal on Language and Language Teaching*, 24(1), 12–22. https://doi.org/10.24071/llt.v24i1.2516

Mauigoa, L. (2006). Enhancing Teachers' Questioning Skills to Improve Children's Learning and Thinking in Pacific Island Early Childhood Centres. *New Zealand Journal of Teachers' Work*, 3(1), 12–23. https://doi.org/https://doi.org/10.24135/teacherswork.v20i1.439

McNaught, K. (2010). Reflective writing in mathematics education programmes. *Reflective Practice*, 11(3), 369–379. https://doi.org/10.1080/14623943.2010.487373

Noor, F., & Ranti, M. G. (2019). Hubungan Antara Kemampuan Berpikir Kritis dengan Kemampuan Komunikasi Matematis Siswa SMP pada Pembelajaran Matematika. *Math Didactic: Jurnal Pendidikan Matematika*, 5(1), 75–82. https://doi.org/10.33654/math.v5i1.470

Nurramadhani, A. (2019). PROFIL KUALITAS KETERAMPILAN BERTANYA MAHASISWA CALON GURU DALAM PEMBELAJARAN SAINS. *Pedagonal : Jurnal Ilmiah Pendidikan*, 3(2), 1–9. https://doi.org/10.33751/pedagog.v3i2.1302

Pate, R. S. (2012). *Open Versus Closed Questions: What Constitutes a Good Question* (E. Ortlieb & R. Bowden, Eds.). Ceder. https://hdl.handle.net/1969.6/97734

Rahmawati, F., & Atmojo, I. R. W. (2021). Analisis Media Digital Video Pembelajaran Abad 21 Menggunakan Aplikasi Canva Pada Pembelajaran IPA. *Jurnal Basicedu*, 5(6), 6271–6279. https://doi.org/10.31004/basicedu.v5i6.1717

Solikin, I. (2018). Implementasi E-Modul pada Program Studi Manajemen Informatika Universitas Bina Darma Berbasis Web Mobile. *Jurnal RESTI (Rekayasa Sistem Dan Teknologi Informasi)*, 2(2), 492–497. https://doi.org/10.29207/resti.v2i2.393

Sugihartini, N., Laba Jayanta, N., Pendidikan, J., Informatika, T., Pendidikan Guru, J., & Dasar, S. (2017). Pengembangan E-Modul Mata Kuliah Strategi Pembelajaran. *Jurnal Pendidikan Teknologi Dan Kejuruan*, 14(2), 221. https://ejournal.undiksha.ac.id/index.php/JPTK/issue/view/716

Sugiyono. (2019). *Metodologi Penelitian Kuantitatif dan Kualitatif dan R&D*. ALFABETA.