Systematics Litrature Review: Development Of Ispring-Assisted Mathematics Learning Media to Develop Students' Numeracy and Digital Literacy Skills

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Abstrak

Kemampuan literasi numerasi dan literasi digital merupakan dua kompetensi esensial yang perlu dikembangkan dalam pembelajaran matematika di era digital. Namun, fakta di lapangan menunjukkan bahwa kedua kemampuan tersebut masih tergolong rendah di kalangan siswa Indonesia. Sementara berbagai penelitian telah mengkaji pengembangan media pembelajaran digital untuk meningkatkan salah satu dari kedua aspek tersebut, masih terbatas kajian yang secara khusus mengintegrasikan keduanya dalam satu media pembelajaran berbantuan *platform* interaktif seperti iSpring. Penelitian ini bertujuan untuk mengkaji hasil-hasil penelitian sebelumya melalui metode *Systematic Literature Review* (SLR) terhadap pengembangan media pembelajaran matematika berbantuan iSpring dalam meningkatkan kemamapuan literasi numerasi dan literasi digital siswa. Data dikumpulkan dari 24 artikel terpilih yang relevan dan dipublikasikan pada rentang waktu 2018-2024. Mengingat minimnya temuan yang secara langsung membahas penggunaan iSpring dalam konteks peningkatan guna meidentifikasi sejauh mana validitas dan proses efektivitas media pembelajaran berbasis iSpring dalam mendukung penguatan literasi numerasi dan literasi digital.

Kata kunci: Media Pembelajaran, iSpring, literasi numerasi, literasi digital

Abstract

Numeracy literacy and digital literacy are two essential competencies that need to be developed in mathematics learning in the digital era. However, field evidence shows that both skills remain relatively low among Indonesian students. While various studies have explored the development of digital learning media to enhance one of these two aspects, there is still a limited number of studies that specifically integrate both into a single learning medium supported by interactive platforms such as iSpring. This study aims to review previous research findings through the Systematic Literature Review (SLR) method on the development of iSpring-assisted mathematics learning media in improving students' numeracy and digital literacy skills. Data were collected from 24 selected relevant articles published between 2018 and 2024. Considering the limited findings that directly address the use of iSpring in this context, the study seeks to identify the extent to which iSpring-based learning media is valid and effective in supporting the enhancement of numeracy and digital literacy.

Keywords: Learning Media, iSpring, Numeracy Literacy, Digital Literacy

INTRODUCTION

The challenges in the field of Education today focus not only on mastery of academic material, but also on how well students understand and use numerical information and their ability to utilize digital technology effectively. In Indonesia, the low achievement of students in numeracy literacy is a serious concern. This is supported by international research that shows that the performance of Indonesian students in doing numeracy questions is still far from expectations. Education researchers in Australia believe that numeracy literacy encompasses the knowledge, skills, behaviors, and dispositions that students need to apply in a variety of situations (Gal et al., 2020). Furthermore, numeracy literacy has been considered to be a basic social and cognitive skill that is integrated in social interaction so that it has a significant effect on daily life (Tett et al., 2006). Therefore, it can be said that numeracy literacy is a bridge between mathematics and the real world (Sabidin et al., 2017).

The Ministry of Education, Culture, Research, and Technology noted that many students still experience challenges in doing numeracy problems related to daily life, and they are also not used to using digital tools to learn effectively. The facts show that the numeracy literacy ability of students in Indonesia is still relatively low, namely: 1) the results of the *Indonesia National Assessment Programme* (INAP) score which measures literacy, mathematics, and science skills for students, national data

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shows that the scores of mathematics (77.13%) and science (73.61%) students are categorized as quite good, but the literacy scores of students (46.83%) are categorized as still low (GLN Team, 2017a), 2) PISA 2015, Indonesian students' score in mathematics is 387 out of an average score of 490, while TIMSS 2016 Indonesian students' mathematics score is 395 out of an average score of 500 and puts Indonesia at the bottom and behind Vietnam (GLN Team, 2017b), and 3) PISA 2018 also shows a decline in the numeracy literacy ability of Indonesian students from PISA 2015, namely Indonesia is ranked 74th out of 79 countries (OECD, 2019). On the other hand, a number of studies show that the use of digital media can improve one of these aspects of literacy. However, research that comprehensively combines the development of numeracy and digital literacy in one complete learning platform is still very limited.

Learning media that have been developed previously often only focus on delivering content in one direction, without maximizing the interactive potential that can improve students' numerical thinking skills and digital skills. There have not been many studies that specifically create math learning applications using the iSpring platform, even though iSpring offers interactive features that allow the presentation of visual materials, exercises, and thorough evaluations. This situation indicates that there is a need for new innovations in the creation of mathematics learning media. This medium not only needs to present the material in an engaging way, but it should also help students develop numeracy and digital literacy skills. Without these innovations, students are likely to find it increasingly difficult to face the technological challenges and demands of the 21st century.

Responding to these problems, this study aims to analyze various problems faced in the implementation of numeracy literacy learning in schools, especially those related to the integration between numeracy literacy and digital literacy. In today's digital age, it is important for students to not only understand basic mathematical concepts, but also be able to apply them through technology-based media. Therefore, this study examines the potential use of iSpring as a mathematics learning medium that not only conveys material, but also simultaneously grows students' numerical abilities and digital skills through contextual, interactive, and technology-based content.

METHOD

This study uses *the Systematic Literature Review* (SLR) method. The SLR research method focuses on the identification, evaluation, and synthesis of literature relevant to a particular research topic in a systematic and structured manner. The purpose of SLR is to present an objective and comprehensive summary of the evidence in the literature related to a topic. The SLR approach can be used to build a strong and comprehensive theoretical foundation. In collecting data, the researcher used 24 article sources. This number contains 5 articles on mathematics learning applications to develop numeracy literacy skills, 5 articles on mathematics learning applications to develop students' digital literacy, and 14 articles on iSpring-Assisted Mathematics Learning Application Innovations. The source of related articles is obtained from Google Scholar and Semantic Scholar with a range between 2018 and 2024. The study obtained is about the innovation of the iSpring-assisted mathematics learning application to develop students' numeracy and digital literacy skills, the articles that have been identified are then presented in the form of a table including journal names, titles and years, author names and research results. The study obtained from these findings can be the basis in the field of education to modify and develop interactive android-based learning media.

RESULTS AND DISCUSSION

The results of the literature *review* obtained from 24 articles are divided into 3 parts, namely the section on mathematics learning applications to develop numeracy literacy, the section on mathematics learning applications to develop digital literacy, and the iSpring-assisted mathematics learning application section. The explanation of the literature review is explained in the following section:

1. Mathematics learning apps to develop numeracy literacy skills.
   The following are some research articles on the development of mathematics learning applications to develop numeracy literacy skills.

Table 1. Mathematics learning apps to develop numeracy literacy skills

Journal Name	Research Title	Author	Research Results

Jurnal Kualita Pendidikan, 4(1), 72-81	Pengembangan Game Edukasi Matematika Berbasis Aplikasi Android untuk Meningkatkan Kemampuan Literasi Numerasi Siswa SMP	Adrillian et al., (2023)	The results of this study show that mathematics education games to improve numeracy literacy skills in statistical materials are valid and practical to be used based on validation assessments by media experts, material experts, and student response questionnaires.
Math Didactic: Jurnal Pendidikan Matematika, 9(3), 446-461	Pengembangan Instrumen Penilaian Matematika Berbasis Literasi Numerasi Menggunakan Aplikasi Quizizz Di Man 2 Medan	Narpila, (2023)	From the results of the study, it can be concluded that the assessment instrument of mathematical assessment instruments is based on numeracy literacy using the Quizizz application has met valid, practical and effective criteria.
Jurnal Program Studi Pendidikan Matematika, 0(2), 574-583	Efektivitas Video Pembelajaran Matematika Untuk Mendukung Kemampuan Literasi Numerasi Dan Digital Siswa	Winarni et al., (2021)	Thus, it can be concluded that the numeracy and digital literacy skills of students in the experimental class were better than in the control class. This means that the use of learning videos in classroom learning is effective from the point of view of the ability to Numeracy Literacy and Digital Literacy Skills of Students.
PEDAGOGI: Jurnal Ilmiah Pendidikan,10(2), 162-169	Efektivitas Penggunaan Aplikasi Pembelajaran Matematika Anmath Untuk Meningkatkan Literasi Numerasi	Cahyani & Khuzaini, (2024)	The result of this study is that the use of the ANMATH mathematics learning application which contains numeracy literacy indicators has been proven to be effective in improving students' numeracy literacy.

Jurnal Abadimas Adi Buana, 8(1), 29-39	Melatih Kemampuan Literasi Numerasi Siswa Madrasah Ibtidaiyah Nurul Huda Sawo Dengan Mengembangkan Lkpd Berbasis Asesmen Kompetensi Madrasah Indonesia (Akmi)	Nurwahid, (2024)	The results of the feasibility test by the validator were 89.25% which means that the LKPD is very suitable to be used, the results of the student response were 83.58% which means that the LKPD is very practical to use, while the results of the numeracy literacy test were 6 students in the high category, 18 students in the medium category, and 9 students in the low category. The developed LKPD can be used in mathematics learning and training students' numeracy literacy skills.

Based on the analysis and review of the collected articles, the results of the study found that the use of digital literacy-based learning media and instruments, such as educational games, digital applications (Quizizz and ANMATH), learning videos, and LKPD that were developed in a structured manner, proved to be valid, practical, and effective in improving students' numeracy literacy skills. Validation from experts and positive responses from students strengthen the feasibility of using these learning media in the classroom. In addition, the use of digital media also contributes to increasing students' digital literacy, especially in experimental classes compared to control classes. Thus, the development of numeracy-literacy-based learning media is feasible to be implemented as part of an innovative and meaningful mathematics learning strategy.

2. Math learning apps to develop students' digital literacy
The following are some research articles on mathematics learning applications to develop students' digital literacy.

Table 2. Math learning apps to develop students' digital literacy

Journal Name	Heading	Author	Research Results
JURNAL EDUKASI BIOLOGI, 10(2), 147-165	Pengembangan Game Edukasi Berbasis Aplikasi Android Untuk Melatih Literasi Digital Dan Keterampilan Argumentasi Ilmiah Siswa Kelas X Sma Pada Materi Virus Dan Peranannya	Putri et al., (2024)	Based on the results of the test, it can be concluded that the android application-based educational game media to train digital literacy and scientific argumentation skills of high school grade X students on virus material and its role is categorized as very feasible and valid to use. This research implies that with the use of android application-based educational games, good digital literacy skills can be obtained and can help students in developing their scientific argumentation skills.
JURNAL PAEDAGOGY: Jurnal Penelitian dan Pengembangan Pendidikan, 9(2), 248-254	Penggunaan Media Game Online Melalui ProProfs untuk Meningkatkan Literasi Digital Siswa di SMP Negeri 1 Gangga	Nurkhasanah, (2022)	The results of this study show that The use of online game media through ProProfs can increase literacy digital students of grade IX.

Pancasakti Science Education Journal PSEJ, 3(2), 109-114	Pengembangan E-Learning Berbasis Schoology pada Materi Impuls dan Momentum untuk Melatihkan Literasi Digital	Misbah et all., (2018)	The results of the study showed: (1) the validity of the media obtained a score of 3.94 in the valid category, (2) The practicality of the media obtained a score of 3.77 in the category of very practical, and (3) the effectiveness of the media obtained a score 0.41 is in the medium category. The conclusion of this study is the development of schoology-based e-learning in Impulse and momentum materials to practice digital literacy are suitable for use in learning.
Bubungan Tinggi: Jurnal Pengabdian Masyarakat, 4(4), 1393-1401	Pengembangan Media Pembelajaran Berbasis Canva untuk Meningkatkan Literasi Digital Guru MGMP Matematika SMP	Sukmawati et al., (2022)	During the training, teachers were very enthusiastic and 80% of teachers stated that they had implemented canva-based learning media in their classrooms so that they could improve digital literacy.
Jurnal Pendidikan IPA, 12(2), 125-134	Pengembangan Mobile Learning Module Berbasis Android Untuk Meningkatkan Literasi Digital Siswa Smp	Wahyuni et al., (2022)	(1) The number of Android-based mobile learning modules is 91% from an average of three validator, (2) the percentage of practicality of the mobile learning module Android-based is 96.8%, (3) the effectiveness score of the android-based mobile learning module is 0.45 obtained from the N test-gain and 97% of the student response questionnaire so that it can be concluded that. Mobile Learning Module Android-based valid, practical and effective to improve students' digital literacy

Based on the analysis and review of the articles collected, the results of the study show that digital learning media such as Android-based educational games, online games (ProProfs), e-learning (Schoology), design platforms (Canva), and Android-based mobile learning modules have consistently proven to be valid, practical, and effective in improving students' digital literacy at various levels of education. These media not only provide an engaging and interactive learning experience, but are also capable of practicing other important skills, such as scientific argumentation. In addition, the high enthusiasm of teachers in implementing digital media in the learning process is also a positive indicator for increasing digital literacy in the school environment. Thus, the development and utilization of digital media in learning is highly recommended as a strategy to strengthen students' digital literacy in the current technological era.

3. iSpring Assisted Math Learning App

Here are some research articles about the iSpring assisted math learning application

Table 3. iSpring Assisted Math Learning App

Journal	Heading	Author	Research Results
Jurnal Pi : Pendidikan Matematika dan Integrasinya, 2(02), 1-3	Pengembangan alat evaluasi pembelajaran matematika soal simulasi ujian sekolah menggunakan aplikasi Ispring suite 10	Yuniarti et al.,2024	This research aims to produce a learning evaluation tool matematika berupa Latihan school exam simulation using the web-based ISpring Suite 10 application that can make it easier for teachers to make

			questions and correct answers and can be used by participants Junior High School (SMP) students for practice questions or simulations in preparation for exams school. From the results of the research, this evaluation tool was declared to be suitable for use and easy to operate Because it can be accessed through laptops/PCs or Android.
Jurnal Ekonomi, Bisnis dan Pendidikan, 1(6), 546-558	Meningkatkan kemandirian dan hasil belajar siswa melalui Pengembangan Mobile Learning berbasis Android Berbantuan Ispring Suite 9	Maurisa & Rahayu, (2021)	Research on the development of android-based mobile learning assisted by Ispring Suite 9 for Increase students' independence and learning outcomes. Based on the above results, it can be concluded that the mobile learning developed is suitable for use in the learning process and has been proven to improve Independence and Learning Outcomes of Students
JTEP-Jurnal Teknologi Pendidikan dan Pembelajaran, 8(1), 469-485	Pengaruh media pembelajaran interaktif berbantuan Aplikasi ispring presenter terhadap kemampuan Berpikir kritis	Sastrakusumah et al., (2023)	Use of interactive learning media With the help of the I-Spring Presenter application, it can improve students' critical thinking skills in PPKn class XI subjects at SMK Negeri 14 Garut.
Lebesgue: Jurnal Ilmiah Pendidikan Matematika, Matematika dan Statistika, 5(1), 22-28	Pengaruh penggunaan media pembelajaran pola bilangan berbantuan ispring suite terhadap hasil Belajar matematika siswa	Mato et al., (2024)	The results showed that there was a positive and significant influence on the use of iSpring Suite-assisted number pattern learning media on students' mathematics learning outcomes.
Griya Journal of Mathematics Education and Application, 4(3), 237-250	Pengembangan media pembelajaran matematika Berbasis aplikasi android menggunakan power point Dan ispring pada materi himpunan untuk siswa kelas VII smp swasta swadaya tarus	Dethan et al., (2024)	This research aims to develop mathematics learning media based on android applications using Power point and Ispring in set materials. Results in this study shows that the application of the class of the association meets the eligibility criteria for valid, practical and effective against the material of the set.
Jurnal Penelitian Pendidikan Matematika, 5(2), 112-124	Pengembangan media pembelajaran interaktif berbasis android menggunakan Ispring untuk materi penyajian data di kelas vii sekolah menengah pertama	Nery et al., (2021)	Interactive defense media has been developed to have a potential effect on student learning outcomes.

Jurnal Kongruen, 3(2), 110-117	Pengembangan media pembelajaran berbantuan ispring suite 11 Untuk mengekplorasi kemampuan numerasi dan koneksi matematis	Merliani et al., (2024)	The result of this research is in the form of a learning media application that can be accessed through an android smartphone with the name "Geo-Metric World". The learning media received a positive response regarding its use from students.
JP3D (Jurnal Pembelajaran dan Pengajaran Pendidikan Dasar), 4(1), 190-197	Pengembangan media berbasis Android berbantuan aplikasi Ispring suite pada pembelajaran Matematika untuk siswa kelas v sd	Larassaty et al., (2021)	The results show that the iSpring Suite-assisted Android-based media is feasible as well as get an excellent response.
Diklabio: Jurnal Pendidikan dan Pembelajaran Biologi	Penggunaan ispring Dalam Pengembangan Media Pembelajaran Interaktif	Firdha & Zulyusri, (2022)	The results of the study stated that Interactive learning media developed using iSpring is worth developing. Moreover the use of iSpring in the creation of learning media interactive also increases motivation as well as response and outcomes learns from students, because it is equipped with images, audio, and videos.
Jurnal Cartesian, 1(1), 14-21	Pengembangan media pembelajaran Matematika smp berbasis android dengan Aplikasi ispring pada materi lingkaran	Rizky & Faizah, (2021)	From the results of the study, it can be concluded that interactive learning media Android-based with the "Good" and "Good" Ispring applications used as a medium Learning.
Jurnal PETIK, 7(1), 71-79	Upaya Meningkatkan Motivasi dan Hasil Belajar Siswa Pada Mata Pelajaran Matematika Melalui Tutorial Pembelajaran Berbasis Ispring Di Kelas X SMAN 10 Garut	Arief et al., (2021)	The purpose of this study is to make a variety of online learning for students by using multimedia-based learning applications as a means to make more quickly introduce mathematics to high school students to find out the extent of multimedia-based use Ispring can be used.
Jurnal Pembelajaran Matematika Inovatif, 6(4), 1335-1344	Penerapan bahan ajar berbantuan ispring suite pada materi bentuk aljabar terhadap kemampuan Pemahaman matematis siswa kelas vii	Sofiah et al., (2023)	Research results shows that there is a difference in the average understanding of mathematics between students using iSpring Suite-assisted teaching materials and students that do not use iSpring Suite-assisted teaching materials. The one-sided t-test shows that the average mathematical comprehension of students who use iSpring Suite-assisted

			teaching materials are better than average comprehension math students who do not use iSpring Suite-assisted teaching materials.
Jurnal Pendidikan Matematika, 1(3), 106-116	Pengembangan media pembelajaran interaktif berbasis android menggunakan ispring suite di kelas vii smp negeri 1dengilo	Muzakir et al., (2024)	This interactive learning media has meets the criteria of practicality. The aspect of effectiveness is seen from the student learning outcomes of 80.01% who have met the completeness, so it can be said that the media Interactive learning has been effective.
Jurnal Penelitian Pendidikan dan Pengajaran Matematika	Pengembangan media pembelajaran berbantuan ispring suite 11 untuk melatih kemampuan representasi Matematis pada materi operasi bilangan pecahan	Gustiana et al., (2024)	The results of this research are in the form of learning application media that can be used on Android smartphones under the name HiFraction. The feasibility of this learning media is assessed based on the assessment of validity, practicality and effectiveness. This learning media was declared very feasible by media experts and material experts and students responded very well to the use of this learning media.

Based on the results of a study of a number of studies that have been conducted on the development and implementation of interactive learning media assisted by the iSpring application, it can be concluded that this media has great potential in improving the quality of the learning process, both in terms of effectiveness, practicality, and attractiveness for students. In general, iSpring-based learning media developed in various studies showed consistent results, namely being feasible, increasing learning independence, and significantly encouraging student learning outcomes. In the context of mobile learning, the use of ispring on the Android platform has been proven to increase students' learning motivation, understanding of mathematical concepts, and critical thinking skills. Several studies have also shown that this media provides a very good response from students, both in terms of visual display, audio, and interactivity offered.

Thus, it can be concluded that iSpring-based interactive learning media, including the school exam simulation application developed in this study, is an innovative alternative that is effective and efficient in supporting the learning process, especially in the context of mathematics learning at the junior high school level. This media not only makes it easier for teachers, but also encourages students to be more active, independent, and motivated in learning.

CONCLUSION

From all the findings that have been analyzed, it can be concluded that the development of technology-based mathematics learning media, especially with the support of the iSpring application, is an innovative strategy that is effective and relevant to improve the quality of mathematics learning. This media not only focuses on academic results, but also on the formation of independent learning character, critical thinking, and students' adaptation to the development of digital technology in the world of education. Considering the results of various studies that have been analyzed, no studies have been found that specifically and comprehensively examine the development of iSpring-assisted learning media that focuses simultaneously on developing students' numeracy literacy and digital literacy skills. This shows that the research topics raised in this study have novelty and urgency to be further developed. The combination of numeracy and digital literacy approaches in one interactive learning medium is a great opportunity to answer the challenges of 21st century learning. Therefore,

this research can be a strong starting foundation for the development of innovative learning media that is more relevant, applicative, and has a positive impact on the quality of education, especially in mathematics learning at the junior high school level.

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