

Developing reviewing gamification on specific learning differences (SpLDs) for pre-service teachers at slow learners care

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Abstract: This research develops a language learning gamification model based on the needs analysis of teacher candidate's workshops on Specific Learning Differences (SpLDs). This research used research and development (R&D) method using Kemp's Instructional Design Model, the data analyzed qualitatively from primary data sources include document analyses of reputable books and relevant journal articles. This research revealed that Quizizz's incorporation into pedagogical workshops replaces traditional paper-based quizzes with interactive games, indicating heightened engagement among adults when gamified learning. Each item is accompanied by clear instructions and employs diverse modes like images, videos, or audio to enhance comprehension. This multimodal approach motivates students by facilitating the integration of textual and visual elements in their learning process. Incorporating reviewing designed games, such as Quizizz, in preservice teachers' workshops for SpLDs is a highly inclusive accommodation. The use of diverse multimodalities and carefully designed questions is essential for ensuring inclusivity and accessibility. This approach shows promise for improving student engagement and addressing the needs of learners with SpLDs.

Keywords: *gamification, Quizizz, reviewing game, specific learning differences (SpLDs), teacher training*

INTRODUCTION

The increasing prevalence of Specific Learning Differences (SpLDs) underscores the urgent need for effective pedagogical approaches to support students with these challenges. On a worldwide scale educational policies situate a great emphasis on inclusion, and teacher must be provided with enough training and knowledge in order to manage both the growing diversity of their students in school and the responsibilities of fostering an inclusive learning environment (Molbaek, 2017). To successfully teach students with specific learning differences (SpLDs), teachers need to know how to effectively apply teaching methods and approaches that work for everyone (Nyikes, 2019). Pre-service teachers, as future educators, play significant roles attending to their student diverse learning needs, including the student with SpLDs.

Pre-service teachers are required to possess the skills and knowledge to effectively serve learners with individual Learning Disabilities (SpLDs), the dynamic characteristics of instructing students with Specific Learning Disabilities (SpLDs) require that pre-service teachers possess the ability to consistently alter and adjust their teaching methods. The ability to adapt is essential for educator since it enables them to accommodate the alternating

condition of their student, guaranteeing that instruction remains efficient and appropriate. Cultivating these abilities for preservice teachers results in more comprehensive and encouraging learning settings for all students, as it is necessary to customize instruction to address students' personal needs and continually modify teaching techniques (Hudson, 2024).

To have the foundational knowledge, skills, and practical experience, teacher preparation programs are crucial in equipping future educators to succeed in the classroom. These programs are designed to prepare teachers to navigate the complexities of real-world teaching environments, ensuring teachers are well accommodated to meet the diverse needs of their students. The teacher preparation programs quality is essential, as the competency of teachers is closely connected to every aspect of student learning (Berry, 2010), as the effectiveness of teachers is intrinsically linked to every aspect of student learning, from academic achievement to social and emotional development. One of the key components of effective teacher preparation is the inclusion of workshops and hands-on training opportunities for pre-service teachers. These workshops are essential for providing future educators with practical experience in implementing various instructional approaches. As McDonald et al. (2019) suggest, organizing workshops for pre-service teachers offers them valuable opportunities to engage in and critically assess activities that serve as real-life examples of instructional methods. These workshops not only allow candidate teachers to practice and refine the teaching techniques they have, but also to reflect on the effectiveness of different strategies in diverse educational contexts. Moreover, by engaging in these practical activities, pre-service teachers can better understand how to adapt their instruction to accommodate all of their student needs, which include those with Specific Learning Differences (SpLDs) and other special educational needs, because teacher preparation programs possessed the ability to shape and improve the development and comprehension of teaching roles and responsibilities (Peterson-Ahmad et al., 2018).

However, several factors have the potential to influence teacher training, including the specific needs of the educational institution, the availability of financial resources, the time allocated for training, the integration of technology, and particularly, the significance placed on continuous professional development (Balbay et al., 2018). Moreover, the feedback mechanism utilized in the training is deemed to be inefficient, as stated by Bayrakçı (2009). To enhance teacher preparation programs, it is crucial for these programs to explore opportunities for advancing the knowledge and skills of preservice teachers (Peterson-Ahmad et al., 2018). Therefore, as a way for pre-service teachers to gain the necessary comprehensive understanding and ability to apply these principles effectively, it can be inferred that they require the opportunities to apply their knowledge in various situations and over time, focused, skilled, honest, frequent, and well-informed feedback on their performance, as well as much practice for their develop-

ing competency to ensure they can transfer their knowledge and ability to various setting, even without the same amount of guidance and support as mentioned by Epanchin & Colucci, (2002). In addition, engaging in game design coursework may aid preservice teachers in cultivating pedagogical and technological expertise to enable the development of problem-solving and critical thinking abilities (Akcaoglu & Kale, 2016). It has been discovered that even adult are more likely to engaged and motivated in gamified teaching activities (Dörnyei, 1994; 2016). Meaningful gamification takes into account the internal motivations of participants and has a better interaction with participants in the long run (Hajarian and Diaz, 2021).

This research will investigate the potential of gamification as a strategic intervention to improve pre-service teachers' knowledge and ability in identifying, understanding, and accommodating students with SpLDs within the context of Slow Learners Care, a community-based organization based on Malang regency, East Java and Kutai Kartanegara regency East Kalimantan that is dedicated to supporting slow learners and students with SpLDs in their educational journey. By investigating the development of a gamified reviewing process, this study aims to contribute to innovative pedagogical practices for pre-service teacher education and inclusive classrooms. There are three proposed research questions of this research: 1) What are the technological and pedagogical approaches of reviewing gamification on specific learning differences (SpLDs) for pre-service teachers at slow learners care?; 2) What are the technology and multimodal approaches of reviewing gamification on specific learning differences (SpLDs) for pre-service teachers at slow learners care?; 3) What are the design principle and accommodations of reviewing gamification on specific learning differences (SpLDs) for pre-service teachers at slow learners care?

METHOD

This research is a research and development (R&D) study in the field of education, utilizing the Kemp's Instructional Design Model that requires constant planning, development, assessment and design to guarantee the effectiveness of instruction. The data collected qualitatively with the primary data sources included document analysis for reviewing or evaluating documents (Bowen, 2009). The documents gained from reputable books by Binu (2021), Kormos & Smith (2023), and relevant journal articles by Berninger (2008), Boud (2000), Carrio-Pastor (2022), Crawford Camiciottoli & Campoy-Cubillo (2018), Coutinho (2009), Dangin (2022), Duncan (2020), Dalke (2010), Fawns (2022), Huang et al. (2023), Mayer (2008), Nolan (1983), Stockwell (2013), Urata (2004), and Villegas (2021). The documents were analyzed through skimming (quick overview), reading (in-depth examination), and interpretation, as suggested by Bowen (2009).

Furthermore, the participants were new teachers undergoing recruitment and training, primarily English department students and fresh grad-

uates of pre-service teachers at Slow Learners Care. The design procedure followed Kemp's Instructional Model from Identify instructional problems of pre-service teachers' knowledge and ability for identifying, understanding, and accommodating students with SpLDs within the context of Slow Learners Care, Examining the characteristics, identify the content and task components from the analyzed documents, stating instructional objectives, designing instructional approach, planning the educational message and delivery, developing assessment tools, and selecting resources in order to support learning activities and instruction.

RESULTS AND DISCUSSION

Results

Training with Technological Familiarity

In designing the reviewing game, the authors considered the technological familiarity of the training participants. The table below shows documents selected for analysis, focusing on technological familiarity, task type awareness, and various pedagogical approaches.

Table 1. Documents on Technological and Pedagogical Approaches

No.	Document Selected	Content Analyzed
1	Slow learners in the English Classroom (Binu, 2021)	Exploring the challenges that slow learners face in learning English.
2	Teaching languages to students with specific learning differences (Kormos and Smith, 2023)	a comprehensive guide for language educators working with students who have Specific Learning Differences (SpLDs).
3	Using blogs, podcasts and Google sites as educational tools in a teacher education program (Coutinho, 2009)	Educator and student coaching about their understanding of technology and the awareness of task type is important for exceptional training programs.
4	Dangin (2022)	Educator and student coaching about their understanding of technology and the awareness of task type is important for interactivensess.
5	Step-by-step visual manuals: Design and development (Urata, 2004)	Educator and student coaching about their technological familiarity and the awareness of task type is important for anxiety decrease or improved confidence.
6	An entangled pedagogy: Looking beyond the pedagogy—technology dichotomy (Fawns, 2022)	Implementing entangled pedagogy.

The analysis highlights the crucial role of technological preparedness in the success of training sessions. To address this, the Slow Learner Care (SLC) director, representing a language education institution dedicated to supporting students with Specific Learning Differences (SpLDs) and slow

learners, ensured that the workshop was well-equipped with necessary infrastructure and technical support. For example, 4G Wi-Fi was made available to all participants, and they were encouraged to bring their personal devices to engage actively in the sessions. For those without personal devices, the organizers provided ten institutional computers and earphones, ensuring inclusivity and accessibility for all attendees.

The workshop was physically conducted at Kedai GF, a venue where ten new educators gathered for induction and training. Most participants were fresh graduates or students from the English department, reflecting the focus on equipping future educators with the skills needed to support diverse learners. To implement an engaging and dynamic learning environment, the workshop incorporated the concept of “entangled pedagogy.” This approach emphasizes interconnected teaching methods and tools. Specifically, Quizizz, an interactive online platform, was used as an integral component within the broader pedagogical framework. This interdependent use of Quizizz helped create a more complex and collaborative learning experience, aligning with the workshop’s goals of fostering inclusivity and adaptability in education.

Technology and Multimodal Approaches

Another consideration in designing the reviewing games for the Pre-Service Teachers at Slow Learners Care was the multimodality in the technology used. The provided table bellows present a review of the documents selected for analysis, highlighting their focus on technology and multimodality in instruction.

Table 2. Documents on Technology and Multimodality

No.	Document Selected	Content Analyzed
1	Technology and motivation in English-language teaching and learning (Stockwell, 2013)	Evaluating games could by captivating by assessing key element that can be motivating in TEL/
2	Teaching Multimodal Metadiscourse in English for Academic Purposes (Carrio-Pastor, 2022)	Multimodal metadiscourse activities (the introduction of MP3, YouTube videos, optional memes and images) can lead student to study by performing and engaging in the process of combining visual and textual metadiscourse.
3	Introduction: The nexus of multimodality, multimodal literacy, and English language teaching in research and practice in higher education settings (Camiciottoli and Cubillo, 2018)	Multimodality is important to motivate learners.

The document analyzed above revealed the significance of using multi-modality in activities like reviewing games. Therefore, in this research, the reviewing games or free interactive games are utilised as an alternative to paper-based quizzes. The authors design a instructional video to demonstrate how to utilize the games for the educator at <https://www.youtube.com/@haidiralgi/videos>. As for the educator, the author oversee participant through the signing up process and logging in using a custom email to avoid spam. Then, giving several time for new educator to familiarize themselves with the game’s instructions and features.

The author show the reviewing games demonstration before the session on YouTube tutorials by Quizizz at https://www.youtube.com/@quizizz_official/videos. The Quizizz comprised of assignment fulfilment (18 items), space for differentiation (automated feedback using hyperlinks), and space to ask questions in the argumentative constructed responses. Each item is provided with understandable guidance and procedural engagement regarding several multimodal modes and prompts. Every feedback and item has either a video, audio, or picture to deliver the question meaning.

Designing Reviewing Game

In designing the reviewing game, some principles and accommodations of the game were carefully considered. The following table summarizes selected documents and their analyzed content regarding design principles and accommodations for individuals with Specific Learning Differences (SpLDs).

Table 3. Documents on Design Principle and Accommodations

No.	Document Selected	Content Analyzed
1	Mayer (2008)	Design principles (visual images, audio cues and linguistic prompts without the use of unnecessary spatial distractions, split attention or gesture)
2	A colour contrast assessment system: design for people with visual impairment (Dalke, 2010)	SpLDs needs accommodations that utilize more conducive colour schemes for accessibility.
3	Consensus or contradiction? A review of the current research into the impact of granting extra time in exams to students with specific learning difficulties (SpLDs) (Duncan, 2020)	SpLDs needs accommodations also comprised of extending or removing time limitations.
4	An analysis of writing in a case of deep dyslexia (Nolan, 1983)	Longer constructed responses could potentially lead to difficulties in phoneme-grapheme conversion.
5	Writing problems in developmental dyslexia: Under-recognized and under-treated (Berninger, 2008)	The longer is the constructed responses could possibly cause misspellings for participants with dyslexia.

6	Trends, research issues and applications of artificial intelligence in language education (Huang et al., 2023)	Q&A task generated by AI may potentially cause misinformation.
7	Sustainable assessment: rethinking assessment for the learning society (Boud, 2000)	Feedback mechanism as Sustainable Assessment to underline the autonomous/independent learning.
8	Who wins when we Flip? Exploring perceptions of Flipped Learning in an Online EAP pre sessional course (Villegas, 2021)	Task completion for differentiation and space to ask questions in the constructed responses

The document analyzed above showed how to design a reviewing game appropriately. In creating the workshop assessment guidelines, the variation of question types and levels of difficulty were considered to verify a comprehensive evaluation to assess participants' understanding. Multiple choice questions (1, 3, and 7) with options which range from A to D were integrated to measure fundamental knowledge (low level of difficulty), while False or True format (2, 4, 5, and 6) was employed to measure complex knowledge. Question 8 used an ungraded polling or voting method, encouraging participant to express their stance on a matter with Agree or Disagree. Question 9-11 will explore and discern the facts and myths surrounding SpLDs, encouraging critical thinking. To increase interactivity, question 12-14 was based from a three minute YouTube video, with 12 constituting a higher level of difficulty through increased distractors, and 13-14 encouraging open-ended responses to incentivize contemplation on inclusive teaching practices and learning theories. Furthermore, question 15 required participant to match the definitions of SpLDs, which exclude autism, which reflect the demographics of student in SLC. Question 16 and 17 inserted concept that is not covered in the previous session, with the aim to preview oncoming lesson and activate participants' schemata. Finally, question 18 presented an auditory comprehension aspect with MP3 audio, aimed to diversifying the assessment with multiple correct answers.

In addition, to assess the preference/satisfaction of the event participant, a short anonymous survey is sent by QR code in <https://bit.ly/EvaluationOnlineClassSLC>. The assessment on the layout (UI/UX), content (items), and other features in the game. The constructive feedback for the most part use visual and linguistic modes, with spatial elements adhering to Quizizz defaults. Gestural cues are made available using two YouTube videos, whereas aural components are limited to the read-the-text feature, one MP3 audio, optional background music, and two more supplementary YouTube videos. Written commentary predominates, utilizing visual and linguistic multimodality, with concise descriptions and hyperlinks which is because of time constraint within the workshop setting. Given the fact that participant are primarily independent readers and newly practicing language professionals. Extensive audio explanations are deemed inessen-

tial, as the data provided has comprehensively covered all pertinent information. The scaffolding provided, using the form of succinct descriptions and hyperlink, is viewed to be effective and sufficient for the workshop's objectives.

Moreover, the multimodality (text and image) is not deemed redundant as it serves to represent the same item meaning regarding reasonable or common adjustment for the learners with SpLDs, the hyperlink is created to motivate the participants to read more, review their understanding/knowledge, and reanalyse the evidence/data, a written commentary is also individualised, humanised, and dialogic to value their efforts/attempts to solve the items, write down their constructed responses, show their positions/stances, or to validate their feelings after choosing the incorrect answer, considering that several questions are hard/new, and motivating feedback was used for both wrong or right answers is helpful and kind. The reviewing games consider vital factors that may be encouraging in TEL, such as a sense of fun competition with colourful figures, background music, and door prizes. Then, items are calculated and considered, comprising of multiple selected and short constructed responses: poll, multiple choice, open-ended, match, comprehension, and reorder and multimodality is used, with visual images, audio cues, and linguistic prompts, without unneeded spatial distractions, split attention, or gestures.

Discussion

The findings indicate that reviewing games addresses the necessity for technological readiness in training, which is crucial for preservice teachers. According to Reeves and Li (2012), teachers generally report that using technology in professional development is effective. They also mention having easy access to the necessary technology, possessing the required computer and technical skills, and perceiving an improvement in some of these skills through course participation. Furthermore, using digital learning tools makes teachers conscious of the need to stay up to date and increase their digital competency, as well as how to support others in doing the same, and look for ways to further their growth and become aware of how technology is changing (Ovcharuk et al., 2020).

This research also showed how to replace traditional paper-based quizzes with a multimodal reviewing game accessible through a platform called Quizizz. Sanchez et al. (2019) argue that incorporating technology and gamification into learning can boost participants' motivation and engagement in completing online quizzes. These quizzes can serve as effective instructional tools, and the act of taking them can enhance learning through the testing effect. Additionally, multimodality in the reviewing game is important to motivate learners (Camiciottoli and Campoy-Cubillo, 2018). Research has demonstrated that by modeling links between multimodal data and feelings (Henderson et al., 2019) and knowledge acquisition (Taub et al.,

2017), multimodal data may provide a rich picture of studying which utilize game-based educational environments. Therefore, designing adaptive and personalized game-based learning can identify students' growing interest and competency in utilizing multimodal data collected during learning activities and effectively intervene and scaffold participants when they exhibit maladaptive behaviors detrimental to performance and interest requires an understanding of the role of multimodal data and its relationship to knowledge acquisition and interest (Emerson et al., 2020).

In designing a multimodal reviewing game and assessment framework used in a workshop for pre-service teachers focusing on Specific Learning Differences (SpLDs), the game was designed to motivate participants through the element of quizzes and the incorporation of the question types. A study from Kita (2021) revealed that participants really liked using quizzes to learn. They appreciated the quick and easy feedback, the fun game-like activities that challenged everyone, and how it made them more interested in learning. Furthermore, Quizzes can promote self-regulated learning by offering chances for regular feedback and information retention. This supports the idea that students are more likely to succeed academically if they actively plan, organize, and adjust their learning practices. By offering timely feedback and encouraging multiple attempts, quizzes support students in identifying knowledge gaps, refining their understanding, and developing effective learning approaches (Nicol and Macfarlane-Dick, 2006; Winne and Hadwin, 1998; and Gikandi et al. 2011; as cited in Tan et al., 2019). However, The success of gamification depends on participants' engagement strategies, such as usability, interactivity, social media, and personalization, as well as how the developers can use the right gamification elements to build effective gamification from the start (Hajarian and Diaz, 2021).

The reviewing game is thoughtfully designed to target a range of learning objectives, ensuring a holistic educational experience. The game's questions focus on critical thinking to promote in-depth analysis, basic comprehension to assist players in understanding fundamental ideas, and learning theories reflecting to connect theoretical understanding with individual insights. By requiring participants to apply what they have learnt in real-world or hypothetical situations, the game also highlights knowledge application, which makes learning interesting and dynamic. The game's strategic use of multimodality, which incorporates both text and graphics, is one of its main features. These components support one another rather than being redundant, providing more information and accommodating different learning preferences. In addition to improving accessibility, this strategy stimulates participants' interest and motivates them to learn more about the subjects being covered. The game makes sure that participants are completely engaged and prepared to process the information by effectively combining textual and visual components.

The personalised feedback that is given during the game is an addition-

al interesting aspect. Particularly when answering difficult questions, this feedback affirms participants' emotions and recognises the work they put into their answers. The game creates a welcoming and inclusive learning atmosphere by providing customised support, which makes participants feel appreciated and inspired to keep learning. Overall, this study highlights how crucial it is to create a well-designed reviewing game in order to create an effective and captivating workshop experience. The game is a great instructional resource because it encourages participants' emotional and intellectual involvement while promoting meaningful learning through the use of multimodal resources and a multidimensional evaluation framework.

CONCLUSION

In conclusion, this research designs a language learning gamification model for preservice teachers' workshops on Specific Learning Differences (SpLDs). It highlights the need for digital literacy in modern teaching methods by incorporating technology into teacher training. This research examines the efficacy of multimodal reviewing games, which are hosted on the Quizizz platform, as a contemporary substitute for conventional paper-based exams employed in teacher education. It presents a gamified assessment framework that promotes self-regulated learning, a crucial aspect for the active production of knowledge and improved metacognition among preservice teachers. The platform integrates a variety of question formats, multimodal components (such as text, graphics, and audio), and adaptive feedback systems. These components are specifically developed to establish a dynamic and inclusive learning environment that caters to a wide range of learning styles and demands. This research seeks to promote motivation, foster critical thinking, and improve problem-solving skills in future educators by substituting traditional quizzes with interactive, game-based evaluations. This technique not only enhances the level of interest in learning but also facilitates the growth of crucial teaching skills. Ultimately, this research enhances pedagogical methods by offering unique tools and strategies to effectively assist learners with Specific Learning Disabilities (SpLDs). The findings provide useful insights for establishing effective and inclusive educational settings that may adjust to the different requirements of students in contemporary classrooms.

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