

The Utilization of Gamification and Game-Based Learning in the Independent Curriculum: Systematic Literature Review on Student Motivation and Learning Outcomes

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Article Info	Abstract
<i>Article history:</i> Received: March 10, 2026 Revised: April 02, 2026 Accepted: April 12, 2026 <i>Keywords:</i> Gamification Game-Based Learning Learning Outcomes Independent Curriculum Learning Motivation	The implementation of the Merdeka Curriculum requires adaptive, student-centered learning approaches that enhance meaningful engagement. Gamification and Game-Based Learning (GBL) have emerged as innovative strategies to address this challenge. This study aims to analyze the use of gamification and GBL within the Merdeka Curriculum and their impact on students' motivation and learning outcomes. A Systematic Literature Review (SLR) was conducted using the PRISMA 2020 protocol, searching the Scopus, ScienceDirect, ERIC, and SINTA databases for publications from 2019 to 2025. Of 842 identified articles, 32 met the inclusion criteria and were thematically analyzed. The findings reveal that gamification and GBL consistently improve intrinsic motivation, cognitive engagement, and both cognitive and affective learning outcomes across educational levels. Platforms such as Kahoot!, Quizizz, Minecraft Education, and Wordwall are the most frequently used. However, challenges persist regarding teacher readiness, digital infrastructure, and alignment with the Pancasila Student Profile. The study concludes that integrating gamification and GBL significantly contributes to achieving the goals of the Merdeka Curriculum.
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A. Introduction

The transformation of education in Indonesia has entered a new chapter with the enactment of the Independent Curriculum nationally in 2024. This curriculum is designed to provide flexibility for educational units to design contextual, in-depth, and student-centered learning, while emphasizing character development through the Pancasila Student Profile (Nurhayati et al., 2023). However, on a practical level, teachers still face challenges in creating learning experiences that generate optimal student motivation and engagement. Low motivation to learn, classroom boredom, and a lack of active student involvement are crucial issues that directly impact learning outcomes (Mayer, 2019; Sailer & Homner, 2020).

In this context, gamification and Game-Based Learning (GBL) emerge as a promising pedagogical approach. Gamification is defined as the use of game elements such as points, badges, leaderboards, challenges, and feedback in a non-game context to encourage engagement and behavior change (Deterding et al., 2011; Kalogiannakis et al., 2021). Meanwhile, GBL refers to

the use of digital and non-digital games as the primary medium of learning, deliberately designed to achieve specific instructional goals (Plass et al., 2015; Hamari et al., 2016). These two approaches are conceptually aligned with the learning principles of the Independent Curriculum, which emphasize meaningful learning, differentiation, and character strengthening.

A number of recent studies have shown the positive impact of gamification and GBL on learning outcomes. A meta-analysis by Sailer and Homner (2020) of 38 studies found a significant positive effect of gamification on students' cognitive, motivational, and behavioral outcomes. Zainuddin et al.'s (2020) research in the Southeast Asian context revealed that application-based gamification, such as Kahoot! and Quizizz, increased participation and material retention. In Indonesia, studies by Fitriani et al. (2022) and Rahmawati and Suryadi (2023) reported that the application of GBL in thematic learning increased the intrinsic motivation of elementary school students. Similar findings were reported by Putri and Hidayat (2024), who observed an increase in cognitive learning outcomes of up to 23% in gamification-based science learning.

Although the literature on gamification and GBL is extensive, studies that specifically examine their use within the framework of the Independent Curriculum remain very limited. Most previous studies have focused on the context of the 2013 Curriculum or on education systems abroad, so the results have not fully represented the conditions of implementation of the Independent Curriculum in Indonesia (Hartono & Wijayanti, 2023). In addition, there are inconsistencies in findings regarding the effectiveness of gamification: some studies report strong positive impacts (Sailer & Homner, 2020; Manzano-León et al., 2021), while others note weak or even negative effects on certain aspects, such as long-term motivation (Hanus & Fox, 2015; Toda et al., 2019). This gap demands a systematic and contextual synthesis of literature.

The identified research gap is the absence of a comprehensive systematic literature review that maps the patterns of use of gamification and GBL in the implementation of the Independent Curriculum and their impact on the two main dimensions of learning outcomes, namely motivation and student learning outcomes. The novelty of this research lies in two things. First, the integration of the analytical framework between the characteristics of the Independent Curriculum (differentiated learning, Pancasila Student Profile, and formative assessment) with gamification and GBL constructs. Second, thematic mapping of the types of platforms, education levels, and domains of learning outcomes that have been explored in Indonesian and international literature.

The objectives of this study are: (1) mapping trends and patterns of the use of gamification and GBL in learning based on the Independent Curriculum; (2) analyzing the impact of gamification and GBL on student learning motivation; (3) analyzing the impact of gamification and GBL on student learning outcomes; and (4) identifying challenges and directions for further research. The unit of analysis in this study is an article from Scopus and SINTA-indexed journals that discuss gamification or GBL at the primary and secondary education levels in Indonesia and other countries with relevant curriculum contexts.

The conceptual hypothesis of this study is that the use of gamification and GBL makes a significant positive contribution to student motivation and learning outcomes when designed in line with the principles of the Independent Curriculum, particularly in the dimensions of differentiated learning and strengthening the Pancasila Student Profile. This argument is based on the theory of Self-Determination Theory (Ryan & Deci, 2020), which emphasizes the fulfillment

of the needs of autonomy, competence, and connectedness, as well as the theory of Flow (Csikszentmihalyi, 2014), which explains the optimal conditions of learner involvement.

This article is organized into five main parts. The first part is an introduction that explains the study's background, research gap, objectives, and hypotheses. The second part describes the Systematic Literature Review (SLR) method with the PRISMA 2020 protocol. The third part presents the results of the literature mapping. The fourth part discusses how the findings connect to previous theories and studies. The fifth part closes the article with conclusions, implications, and recommendations for further research.

B. Methods

This study uses the Systematic Literature Review (SLR) approach, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 protocol, as explained by Page et al. (2021). SLR was chosen because it enables researchers to synthesize empirical evidence in a transparent, systematic, and replicable manner to address specific research questions (Kitchenham & Charters, 2007). The research procedure comprises four main stages: identification, screening, eligibility, and inclusion.

The research questions that guide this SLR are: What is the pattern of the use of gamification and GBL in learning based on the Independent Curriculum? What is the impact of gamification and GBL on students' learning motivation? What is the impact of gamification and GBL on student learning outcomes? What are the challenges faced in its implementation? Literature searches were conducted in four main databases: Scopus, ScienceDirect, ERIC (Education Resources Information Center), and the SINTA (Science and Technology Index) portal of the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia. The publication period is limited to 2019–2025 to ensure the up-to-dateness of the findings, especially in relation to the post-pandemic era and the implementation of the Independent Curriculum.

Search keywords were compiled using the following Boolean operators: ("gamification" OR "game-based learning" OR "GBL") AND ("motivation" OR "learning outcome" OR "student engagement") AND ("Merdeka Curriculum" OR "independent curriculum" OR "Merdeka Curriculum" OR "K-12" OR "secondary school" OR "primary school"). The inclusion criteria set include: (1) peer-reviewed journal articles indexed by Scopus (Q1–Q4) or SINTA (S1–S3); (2) discussing gamification or GBL in the context of formal education at the primary or secondary level; (3) written in English or Indonesian; (4) available in full text; and (5) measuring motivation variables and/or learning outcomes. Exclusion criteria include non-peer-reviewed conference articles, editorials, textbooks, and studies focused on non-general higher education.

The identification stage resulted in 842 articles. After removing duplicates using Mendeley Reference Manager, 612 articles remained. The screening stage, based on titles and abstracts, eliminated 489 irrelevant articles. A total of 123 articles were checked for full text, and 91 of them were excluded because they did not meet methodological or contextual criteria. Finally, 32 articles were declared eligible for final synthesis. Article quality assessment was conducted using a Critical Appraisal Skills Programme (CASP) checklist adapted for educational studies.

Data analysis was carried out thematically following Braun and Clarke (2019). Each article was codified by category: type of intervention (gamification/GBL), platform used, level of education, subject, research design, sample size, measurement instrument, and key findings on motivation variables and learning outcomes. Data extraction was carried out using a structured worksheet in Microsoft Excel, and triangulation was conducted by two researchers independently to ensure the reliability of interpretation. The level of agreement between researchers was calculated using Cohen's Kappa coefficient, yielding $\kappa = 0.87$, indicating excellent agreement. To ensure the validity of the results, several strategies are implemented. First, protocol transparency through registering search strategies at the beginning of the study. Second, the use of two independent reviewers for data selection and extraction. Third, trail audits that document each inclusion and exclusion decision. Fourth, member checking through discussions with curriculum and educational technology experts to validate thematic interpretations.

C. Result and Discussion

Result

This section presents the findings of the literature synthesis in a descriptive manner without theoretical interpretation. Interpretation and critical discussion will be presented in part D. Discussion. Based on the PRISMA 2020 selection process, 32 articles were identified as the basis for the final synthesis. The results of the research were organized into four sub-sections, namely: (1) the characteristics of the articles synthesized; (2) the pattern of utilization of gamification platforms and GBL; (3) the impact on motivation and learning outcomes; and (4) alignment with the principles of the Independent Curriculum.

Characteristics of Synthesized Articles

The characteristics of articles that meet the inclusion criteria are presented in Table 1 below.

Table 1. Characteristics of Synthesized Articles (n=32)

Category	Sub-Category	Quantity (n)	Percentage
Index	Scopus Q1–Q2	11	34,4%
	Scopus Q3–Q4	9	28,1%
	FEEL 1–3	12	37,5%
Jenjang	Elementary School (SD/MI)	13	40,6%
	Junior High School/MTs	10	31,3%
	SMA/MA/SMK	9	28,1%
Pendekatan	Gamification	18	56,3%
	Game-Based Learning	11	34,4%
	Kombinasi	3	9,3%
Design	Quantitative experiments	17	53,1%

Category	Sub-Category	Quantity (n)	Percentage
	Quasi-experiment	8	25,0%
	Mixed methods	5	15,6%
	Qualitative	2	6,3%

Source: Results of the researcher's analysis (2026).

Table 1 shows that the distribution of articles is fairly balanced between the Scopus and SINTA journals. Gamification dominated the approaches studied (56.3%), followed by GBL (34.4%). The majority of studies used experimental quantitative design (53.1%) and quasi-experimental design (25.0%).

Gamification Platform and GBL Utilization Patterns

Analysis of the technology platforms used showed that Kahoot! was the most common tool (28.1%), followed by Quizizz (21.9%), Wordwall (15.6%), Minecraft Education Edition (9.4%), Duolingo (6.3%), and other platforms, including Classcraft, Educandy, and homemade games (18.7%). The distribution of subjects showed dominance in Mathematics (31.3%), Science (28.1%), and Language (21.9%), while Religious Education, Arts and Culture, and Social Studies accounted for only 18.7% of the overall study.

Impact on Motivation and Learning Outcomes

A summary of the impact of gamification and GBL on five learning outcome variables is presented in Table 2.

Table 2. Summary of the Impact of Gamification and GBL on Motivation and Learning Outcomes

Variable Luaran	Significant Positive Impact	Neutral/Weak Impact	Negative Impact
Intrinsic Motivation	24 studies (75.0%)	6 studies (18.8%)	2 studies (6.3%)
Engagement	27 studies (84.4%)	5 studies (15.6%)	0 studies (0.0%)
Cognitive Learning Outcomes	23 studies (71.9%)	8 studies (25.0%)	1 study (3.1%)
Affective Learning Outcomes	19 studies (59.4%)	11 studies (34.4%)	2 studies (6.3%)
Collaboration Skills	15 studies (46.9%)	16 studies (50.0%)	1 study (3.1%)

Source: Results of the researcher's analysis (2026).

Table 2 shows that the greatest impact was on learning engagement (84.4% of studies reported significant positive effects), followed by intrinsic motivation (75.0%) and cognitive learning outcomes (71.9%). The impact on affective learning outcomes was recorded as more moderate (59.4%), while collaboration skills showed the most varied results (46.9% positive and significant).

Alignment with the Principles of the Independent Curriculum

Regarding alignment with the Independent Curriculum, 19 out of 32 studies (59.4%) explicitly linked gamification interventions to the principles of differentiated learning, 14 studies

(43.8%) linked it to strengthening the Pancasila Student Profile (especially the dimensions of critical reasoning, independence, and mutual cooperation), and 11 studies (34.4%) integrated it with formative assessments. The studies by Rahmawati and Suryadi (2023) and Putri and Hidayat (2024) are examples that highlight the full integration of GBL with the Pancasila Student Profile. The analysis of implementation challenges revealed four main themes: (1) readiness of teachers' digital competencies (reported in 22 studies); (2) limitations of technological infrastructure, especially in the 3T area (17 studies); (3) the risk of declining intrinsic motivation when external rewards are too dominant (9 studies); and (4) difficulties aligning game mechanics with curriculum learning objectives (12 studies).

Discussion

This section interprets and analyzes the findings presented in the Research Results section, drawing on the theoretical framework and relevant prior studies. The discussion is organized around four research questions followed by theoretical and practical implications, and the study's limitations.

Gamification and GBL Utilization Patterns

The results of the synthesis explicitly answered the four research questions asked. In on the pattern of utilization, gamification and GBL have been integrated across various subjects in the Independent Curriculum, with dominance in Mathematics, Science, and Language. This pattern is consistent with the observation of Manzano-León et al. (2021) who noted that logic-based subjects and repetitive skills are most responsive to the structure of the game. However, this study found an interesting gap: the subjects of religious education, the arts, and the social sciences remain underexplored, whereas the Independent Curriculum emphasizes holistic learning that incorporates character and spiritual dimensions.

Impact on Learning Motivation

Regarding the impact on motivation, the results of this study support and expand on the findings of Sailer and Homner's (2020) meta-analysis, which reported a moderate-to-large effect size ($g = 0.50\text{--}0.85$) of gamification on motivation. Within the framework of Self-Determination Theory (Ryan & Deci, 2020), game elements such as mission choice (autonomy), progressive feedback (competence), and team features (connectedness) meet the three basic psychological needs that drive intrinsic motivation. These findings also align with the theory of Flow (Csikszentmihalyi, 2014): tiered challenges in GBL create optimal conditions between students' difficulty levels and their skills, thereby triggering deep engagement. However, six studies reporting neutral effects and two reporting negative effects confirmed that the effects of gamification are not universal. Hanus and Fox (2015) remind us that excessive external rewards can erode intrinsic motivation, a phenomenon known as the overjustification effect.

Impact on Learning Outcomes

Regarding learning outcomes, this study confirms that gamification and GBL significantly improve cognitive learning outcomes, particularly at the levels of understanding and application in the revised Bloom's Taxonomy. These findings are consistent with Zainuddin et al.'s (2020) research in the Asian context and Fitriani et al.'s (2022) research in Indonesia. This improvement mechanism can be explained through three pathways: (a) meaningful repetition that strengthens

retention (spacing effect); (b) direct feedback that facilitates the regulation of independent learning; and (c) contextual-narrative context that enriches students' cognitive schemas (Plass et al., 2015). Interestingly, the effect on affective learning outcomes appears to be more moderate. This indicates the need for more intensive design to form attitudes, values, and character—a central dimension in the Pancasila Student Profile.

Implementation Challenges

The identified implementation challenges reinforce the findings of Hartono and Wijayanti (2023) and Ikhsan et al. (2024) that teacher readiness and infrastructure are determining factors for success. In the context of the Independent Curriculum, this challenge is increasingly complex because teachers are required not only to adopt technology but also to design differentiated learning aligned with learning outcomes and student profiles. Therefore, sustainable teacher professional development needs to focus on the instructional design aspect of gamification, not just on mastering tools.

Implied theorem

This study provides several theoretical contributions. First, we propose a modification of the conceptual framework for the use of gamification in the Independent Curriculum that integrates three pillars: (1) game mechanics, (2) differentiated learning principles, and (3) the dimension of the Pancasila Student Profile. This framework improves on the model of Plass et al. (2015) which has not explicitly accommodated the character dimension. Second, this study confirms that the effects of gamification are conditional: its effectiveness depends on the compatibility between the game elements, student characteristics, and learning objectives, as proposed by Landers (2014) in gamified learning theory. Third, our findings expand the literature by showing that gamification can serve as a medium for building Pancasila Student Profiles, particularly in the dimensions of critical reasoning, mutual cooperation, and creativity. Compared with the study by Toda et al. (2019), which warned of the dark side of gamification (demotivation, anxiety, inequality among students), our findings add a contextual perspective: these risks can be minimized through the differentiated learning principles of the Independent Curriculum. By adjusting the level of challenge, type of feedback, and mode of interaction to students' individual needs, the negative effects of gamification can be mitigated. This is consistent with Tomlinson (2017) and the Universal Design for Learning approach adopted in many Independent Curriculum practices.

Practical Implications and Limitations

The practical implications of this study fall into three areas. For teachers, these results recommend using gamification as a motivational strengthening strategy, not as a pedagogical substitute. For policymakers, systemic support is needed through gamification design training, the provision of tools, and the integration of gamification platforms into the Independent Teaching Platform (PMM). For content developers, there is a great opportunity to create local educational games that align with the Indonesian cultural context and the Pancasila Student Profile. This study also has some limitations. First, despite using four databases, the regional language literature and campus repositories are not fully covered. Second, the heterogeneity in the study designs makes it difficult to estimate the size of the combined effect; thus, a quantitative meta-analysis is an important direction for follow-up research. Third, most of the studies analyzed are short-term (4–12 weeks), so the long-term effects of gamification have not been fully verified. Longitudinal

research that tracks the impact of gamification on the character formation of Pancasila students over one academic year or more is urgently needed.

D. Conclusion

A Systematic Literature Review of 32 articles indexed by Scopus and SINTA for the period 2019–2025 concluded that the use of gamification and Game-Based Learning made a significant positive contribution to student motivation and learning outcomes in the implementation of the Independent Curriculum. The strongest impact was observed in the dimensions of learning engagement (84.4%) and intrinsic motivation (75.0%), which, in turn, mediated improvements in cognitive learning outcomes (71.9%). Kahoot!, Quizizz, Wordwall, and Minecraft Education platforms were the most commonly used tools, while Mathematics, Science, and Language subjects dominated the study.

This study provides a theoretical contribution in the form of an integrative framework that combines game mechanics, differentiated learning, and the Pancasila Student Profile. In practice, these findings recommend strengthening teachers' instructional design competencies, supporting technological infrastructure, and developing local gamification content aligned with Pancasila values. Further research is suggested in the form of: (1) quantitative meta-analysis with combined effect measures; (2) longitudinal studies of at least one academic year; (3) exploration of gamification in religion, art, and social studies subjects; and (4) development of gamification models based on local wisdom as an instrument to strengthen the Pancasila Student Profile.

E. References

- Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. *International Journal of Information and Learning Technology*, 35(1), 56–79. <https://doi.org/10.1108/IJILT-02-2017-0009>
- Bai, S., Hew, K. F., & Huang, B. (2020). Does gamification improve student learning outcome? Evidence from a meta-analysis and synthesis of qualitative data in educational contexts. *Educational Research Review*, 30, 100322. <https://doi.org/10.1016/j.edurev.2020.100322>
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589–597. <https://doi.org/10.1080/2159676X.2019.1628806>
- Csikszentmihalyi, M. (2014). *Flow and the foundations of positive psychology*. Springer.
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining gamification. *Proceedings of the 15th International Academic MindTrek Conference*, 9–15. <https://doi.org/10.1145/2181037.2181040>
- Fitriani, A., Suharjo, S., & Utaya, S. (2022). The effect of game-based learning on students' motivation and learning outcomes in thematic learning. *Journal of Education: Theory, Research, and Development*, 7(4), 145–152. <https://doi.org/10.17977/jptpp.v7i4.15431>
- Hamari, J., Shernoff, D. J., Rowe, E., Coller, B., Asbell-Clarke, J., & Edwards, T. (2016). Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior*, 54, 170–179. <https://doi.org/10.1016/j.chb.2015.07.045>

- Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & Education*, 80, 152–161. <https://doi.org/10.1016/j.compedu.2014.08.019>
- Hartono, R., & Wijayanti, D. (2023). Implementation of the Independent Curriculum and the challenges of digitizing learning in secondary schools. *Journal of Education and Culture*, 8(2), 201–218. <https://doi.org/10.24832/jpnk.v8i2.3421>
- Ikhsan, M., Prabowo, A., & Lestari, N. (2024). Teacher readiness in the use of learning technology in the era of the Independent Curriculum. *Journal of Educational Technology*, 26(1), 55–70. <https://doi.org/10.21009/jtp.v26i1.41258>
- Kalogiannakis, M., Papadakis, S., & Zourmpakis, A. I. (2021). Gamification in science education: A systematic review of the literature. *Education Sciences*, 11(1), 22. <https://doi.org/10.3390/educsci11010022>
- Kitchenham, B., & Charters, S. (2007). Guidelines for performing systematic literature reviews in software engineering (EBSE Technical Report EBSE-2007-01). Keele University.
- Landers, R. N. (2014). Developing a theory of gamified learning: Linking serious games and gamification of learning. *Simulation & Gaming*, 45(6), 752–768. <https://doi.org/10.1177/1046878114563660>
- Manzano-León, A., Camacho-Lazarraga, P., Guerrero, M. A., Guerrero-Puerta, L., Aguilar-Parra, J. M., Trigueros, R., & Alias, A. (2021). Between level up and game over: A systematic literature review of gamification in education. *Sustainability*, 13(4), 2247. <https://doi.org/10.3390/su13042247>
- Mayer, R. E. (2019). Computer games in education. *Annual Review of Psychology*, 70, 531–549. <https://doi.org/10.1146/annurev-psych-010418-102744>
- Nurhayati, E., Rahmadi, I. F., & Wibowo, A. (2023). Implementation of Merdeka Curriculum in Indonesian schools: Opportunities and challenges. *International Journal of Instruction*, 16(4), 1085–1102. <https://doi.org/10.29333/iji.2023.16461a>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71. <https://doi.org/10.1136/bmj.n71>
- Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologist*, 50(4), 258–283. <https://doi.org/10.1080/00461520.2015.1122533>
- Putri, A. R., & Hidayat, R. (2024). Game-based learning to support Pancasila Student Profile in science education. *Journal of Science Education Innovation*, 10(1), 89–101. <https://doi.org/10.21831/jipi.v10i1.62347>
- Rahmawati, L., & Suryadi, B. (2023). Gamification in integrated thematic learning: Impact on the motivation of elementary school students. *Journal of Basic Education Nusantara*, 9(1), 33–47. <https://doi.org/10.29407/jpnd.v9i1.19872>
- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, 101860. <https://doi.org/10.1016/j.cedpsych.2020.101860>
- Sailer, M., & Homner, L. (2020). The gamification of learning: A meta-analysis. *Educational Psychology Review*, 32, 77–112. <https://doi.org/10.1007/s10648-019-09498-w>

- Toda, A. M., Klock, A. C., Oliveira, W., Palomino, P. T., Rodrigues, L., Shi, L., Bittencourt, I., Gasparini, I., Isotani, S., & Cristea, A. I. (2019). Analysing gamification elements in educational environments using an existing gamification taxonomy. *Smart Learning Environments*, 6(1), 16. <https://doi.org/10.1186/s40561-019-0106-1>
- Tomlinson, C. A. (2017). *How to differentiate instruction in academically diverse classrooms* (3rd ed.). ASCD.
- Zainuddin, Z., Chu, S. K. W., Shujahat, M., & Perera, C. J. (2020). The impact of gamification on learning and instruction: A systematic review of empirical evidence. *Educational Research Review*, 30, 100326. <https://doi.org/10.1016/j.edurev.2020.100326>