

TRENDS OF INSTRUCTIONAL DESIGN DEVELOPMENT: A BIBLIOMETRIC ANALYSIS

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Abstract

Instructional design, as part of educational technology, is very useful in planning the desired direction of teaching and learning activities. Designers need to have a direction that can relate to the rapid development of the times. Researchers conducted a bibliometric study to review the current direction of instructional design development. This study is characterized by being analytical across time, as it is based on analyzing files in the time period (2013-2023) collected in Google Scholar database of 1000 articles. Then the article data obtained was analyzed to see what retention had developed. The results of the review show that there are various instructional design directions relevant to various constructs, such as (1) online learning, (2) blended learning/instruction, (3) project-based learning, (4) gamification, (5) instructional modules, (6) computer-assisted learning, and (7) simulation-based learning. These four results have signaled that the current paradigm is within the scope of e-learning. These results can be used as an illustration for educators and other designers to see the latest emerging instructional design trends.

Keywords: Instructional Design, Bibliometric, Literature Review

Abstrak

Desain pembelajaran, sebagai bagian dari teknologi pendidikan, sangat berguna dalam merencanakan arah kegiatan belajar mengajar yang diinginkan. Desainer perlu memiliki arah yang dapat berhubungan dengan perkembangan zaman yang begitu cepat. Peneliti melakukan studi bibliometrik untuk meninjau arah pengembangan desain pembelajaran saat ini. Studi ini memiliki karakteristik analitis lintas waktu, karena didasarkan pada analisis file dalam periode waktu (2013-2023) yang dikumpulkan dalam basis data Google Scholar sebanyak 1000 artikel. Kemudian data artikel yang diperoleh dianalisis untuk melihat retensi yang telah berkembang. Hasil tinjauan menunjukkan bahwa terdapat berbagai arah desain pembelajaran yang direlevansikan dengan berbagai konstruk, seperti (1) online learning, (2) blended learning/instruction, (3) project-based learning, (4) gamifikasi, (5) modul pembelajaran, (6) pembelajaran berbantuan komputer dan (7) pembelajaran berbasis simulasi. Keempat hasil tersebut telah menandakan bahwa paradigma saat ini telah berada pada lingkup pembelajaran berbasis elektronik (e-learning). Hasil ini bisa dijadikan sebagai gambaran bagi pendidik maupun desainer lainnya dalam melihat tren desain pembelajaran terkini yang telah berkembang.

Kata Kunci: Desain Pembelajaran, Bibliometrik, Kajian Literatur

Introduction

Various sectors, including industry, education, and the military, derive instructional design models. As a result, vocational education is often seen as the primary context where instructional design models are relevant. In order to make informed decisions, educators must be aware of the origins of the model, the rationale behind its development, its alignment with their specific objectives and environment, and the extent of documentation, application, and

validation associated with the model. Previous experiences have shown that instructional design models are significant in education, and educators find a methodical approach rational and beneficial. Nevertheless, educators frequently encounter uncertainty regarding the selection of a suitable model due to the abundance of available models and the lack of comprehensive literature detailing the model or providing accounts of its utilization. Furthermore, the inadequate

validation of numerous models contributes to the unsatisfactory reception of systematic approaches.

Moreover, the processing characteristics associated with teachable information are very similar to the information processing characteristics in biological evolution, which makes it possible to use the well-known processes that guide biological evolution as templates to help understand aspects of human cognition relevant to instructional design. Instructional design is largely concerned with the best procedures to help learners acquire biologically secondary knowledge. Such procedures rely on aspects of the human cognitive architecture associated with the acquisition of secondary knowledge. The architecture allows humans to process information analogously to the way evolution, through natural selection, processes information¹.

The development of instructional design procedures and instructional design tools is an invention. Instructional design technology, like any other technology, is not a natural phenomenon. They are man-made, designed to serve the needs of learning. Design research involves discovering procedures and processes that incorporate what we learn from the instructional sciences. Natural laws do not govern these instructional design procedures. They are developed by creative discovery to make them work better². Instructional design theory requires at least two components, such as (1) methods for facilitating learning and human development (also called learning methods), and (2) indications of when to use or not use those methods (also called situations). Not all aspects of the context influence the methods that should be used, even though the term "context" has the

same meaning in layman's language and is often used in education. An important feature of instructional design theories is that the methods they offer are situational, not universal. In other words, one method may work well in one situation, while another method may work well in a different situation³.

Instructional design continues to evolve in line with technological advances, changes in the way people learn, and the increasingly complex needs of the job market. Trends in instructional design include not only technological aspects but also skill development relevant to the world of work. Therefore, this article seeks to answer the questions, namely, (1) what are the current trends in instructional design, and (2) how should we respond to these evolving trends? Following these trends can help curriculum developers, teachers, and instructors create instructional experiences that are effective and relevant to future needs. Thus, it is hoped that this article can be an answer to the current development of instructional design.

Research Method

This article presents a narrative review that employs a bibliometric approach to examine a wide range of topics, such as frequency distributions of words and phrases in text databases, interlinking of websites, longitudinal studies of academic discipline development, and the publication and citation patterns of individuals, research groups, or institutions. The focus of this article is to investigate instructional design trends by analyzing 1000 journal and conference articles published over the past decade (2013-2023) sourced from the Google Scholar index. The selection of this index is based on its extensive database and widespread use in literature searches⁴. In addition, it also provides

¹ John Sweller, 'Instructional Design', in *Encyclopedia of Evolutionary Psychological Science*, ed. by Todd K. Shackelford and Viviana A. Weekes-Shackelford (Cham: Springer International Publishing, 2021), pp. 4159–63 <https://doi.org/10.1007/978-3-319-19650-3_2438>.

² M. David Merrill and others, 'Reclaiming Instructional Design', *Educational Technology*, 36.5 (1996), 5–7.

³ Charles M. Reigeluth, 'What Is Instructional-Design Theory and How Is It Changing?', in *Instructional-Design Theories and Models: A New Paradigm of Instructional Theory* (Routledge, 1999).

⁴ Dedi Kuswandi, Citra Kurniawan, and others, 'Visualizing Trend of 21st-Century Curriculum: A Bibliometric Analysis' (presented at the 7th International Conference on Education and Technology (ICET 2021),

Based on the picture above, we can see the main keywords about instructional design. These keywords are "instructional design practice", "instructional design principles", "instructional design approach", "instructional design theory", "instructional design strategy", and "instructional design framework". The keyword "instructional design practice" contains points such as "focus", "challenge", "influence", "case", "evaluation", "evidence", "information", "curriculum", "instructional design strategy", "instructional strategy", "literature", "tool", "data", "teacher", "chapter", "design process", "context", "display", "time", "experience", and "faculty". The keyword "instructional design principle" contains points such as "MOOCs", "quality", "implementation", "case", "content", "online", "blended learning", "evaluation", "simulation", "ADDIE Instructional Design Model", "ADDIE Model", "module", "evidence", "application", "curriculum", "literature", "tool", "math", "idea", "game", "review", "educator", "way", "need", "implication", "section", "chapter", "design process", "faculty", "field", "abstract", "instructor", "motivation", "brave course", "instructional material", "computer", "challenge", and "case". In the keyword "instructional design approach", there are points such as "online course", "computer", "MOOC", "effectiveness", "instructional strategy", "evidence", "simulation", "literature", "application", "instructional design component", "book", "author", "game", "data", "need", "section", "project", "faculty", "experience", "context", "design process", "chapter", "review", and "field". In the keyword "instructional design theory" contains points such as "online course", "guideline", "instructional material", "computer", "content", "field", "instructional design strategy", "instructional strategy", "instructional design framework", "instructional design components", "work", "chapter", "design process", "view", "game", "lesson", "time", "project", "experience", "instructional technology", "issue" and "instructor". The keyword "instructional design strategy" contains points such as "online course",

"effect", "challenge", "influence", "effectiveness", "blended learning", "ADDIE instructional design model", "evaluation", "module", "instructional strategy", "work", "review", "educator", "way", "older", "lesson", "context", "experience", "instructional design practice" and "instructional design theory". Finally, the keyword "instructional design framework" contains points such as "MOOCs", "effectiveness", "case", "quality", "ADDIE", "module", "curriculum", "application", "mathematics", "literature", "author", "educator", "review", "work", "instructional design theory", "field" and "classroom".

Thoughtful planning and organization of instruction are essential to ensuring the quality of education, which is its ultimate goal. Instructional design directs the achievement of this goal through better and more effective learning. Instructional design, which has grown in importance during the 21st century, has led to the development of many models to enhance learning as a result of technological advances⁵. Based on these points, it can be seen that the current learning directions are (1) online learning, (2) blended learning/instruction, (3) project-based learning, (4) gamification, (5) learning modules, (6) computer-assisted learning, and (7) simulation-based learning.

Discussion

Online Instructional Design

Numerous methodologies, theoretical constructs, and conceptual frameworks exist for the creation of high-quality online learning environments. These resources serve to assist and direct instructional designers in the comprehensive examination, conceptualization, construction, execution, and assessment of pedagogical and learning procedures. Educators and instructional designers can enhance student achievement by embracing deliberate program designs that foster engagement, involvement, and communication within the online learning milieu,

⁵ Idris Göksu and others, 'Content Analysis of Research Trends in Instructional Design Models: 1999-2014', *Journal of Learning Design*, 10.2 (2017), 85–109.

as the effectiveness of online learning is influenced in part by the attributes that students possess in the online learning setting.

Instructional design functions as both a framework and a tool that offers direction for the arrangement and development of a program. Through systematic guidance, it facilitates the rapid focus of learners on a subject and the elimination of distractions while still enabling learners to maintain autonomy over their learning. Additionally, it aids educators in structuring content, effectively sequencing instruction, providing assistance and support to learners, and fostering engaging, meaningful, and active learning. This is particularly crucial in light of the increasing shift towards online learning.

Numerous instructional design methods that have been in existence for several decades may not be congruent with the current methodology of developing online learning in the realm of education. There exists a dearth of comprehension pertaining to the widespread utilisation of instructional design models in the creation of online learning, the variables that influence the choice of these models, and the perceived suitability of these models among instructional designers for the construction of online learning.

As online education continues to evolve, particularly in response to the COVID-19 pandemic, it is crucial for scholars and educators to comprehend the application of novel educational methodologies and technologies that can cultivate a sense of community and enhance the online learning environment. The capacity of the online setting to establish networks of ideas, promote critical thinking, and facilitate the formation of communities of practice among individuals and remote groups is undeniably its distinctive advantage. This has significant implications for the design of learning experiences. Designers must transcend the methodologies utilised by initial adopters and establish educational environments that enable exchange and cooperation via networked communication. Interactivity plays a crucial role

in fostering engagement within knowledge-building communities and is progressively becoming a prerequisite for those involved in online learning communities. Our task involves creating innovative pedagogical frameworks that promote continuous cooperative learning and enable the effective acquisition of collaborative learning techniques across various domains and disciplines.

Blended Instructional Design

Blended learning encompasses a more comprehensive approach that extends beyond the mere amalgamation of online learning and face-to-face learning. It is dynamic and context-dependent. Diverse situations and viewpoints unveil its ever-changing and context-specific character. Varying situations exhibit distinct requirements and attributes. This necessitates the utilisation of a distinct amalgamation of blended learning. Nevertheless, blended learning invariably shares a singular ultimate objective, namely to ascertain the most suitable amalgamation in order to facilitate an optimal educational encounter⁶. Hence, there is a requirement for a design that pertains to blended learning, achieved through the application of blended instructional design.

Blended learning aims to optimize learning activities for the better and facilitate learning characteristics and independence⁷. Blended learning delivery, which focuses on providing learning notes and additional resources for students, is still the most frequently supported activity⁸. When students engage in active

⁶ Uwes Anis Chaeruman and Santi Maudiarti, 'Quadrant of Blended Learning: A Proposed Conceptual Model for Designing Effective Blended Learning', *Jurnal Pembelajaran Inovatif*, 1.1 (2018), 1–5.

⁷ Tsuwaybah Al Aslamiyah, Punaji Setyosari, and Henry Praherdhiono, 'Blended Learning Dan Kemandirian Belajar Mahasiswa Teknologi Pendidikan', *JKTP: Jurnal Kajian Teknologi Pendidikan*, 2.2 (2019), 109–14 <<https://doi.org/10.17977/um038v2i22019p109>>.

⁸ Leo Havemann and others, 'A Multitude of Modes: Considering "Blended Learning" in Context' (presented at the CDE RIDE conference 2019, London, 2019) <<https://london.ac.uk/centre-distance-education/cde-activities/cde-events#ride-2019-conference>> [accessed 22 February 2023].

participation by contributing their ideas and engaging in collaborative discussions, they will mutually enhance each other's learning experience. Blended learning enables students to achieve higher learning performance through clear interactive strategies that involve both face-to-face and non-face-to-face learning activities⁹. For this reason, blended learning allows learners to have freedom in their learning while still getting intense guidance from the teacher¹⁰.

Table 1. Blended Learning Settings ¹¹

Synchronous Learning		Asynchronous Learning	
Face-to-face (Live Synchronous)	Virtual Face-to-face (Virtual Synchronous s)	Independent/Self (Self-directed Asynchronous)	Collaborative (Collaborative Asynchronous)

The blended learning mode should be designed based on insights into understanding the character and nature of students and content preparation¹². The instructional design should also consider the prior experience and knowledge of the self-learners¹³. Many empirical studies have shown the need for further research into the effective integration of traditional offline learning approaches and online technologies in learning¹⁴. The manifestations that can be done are: (1) teaching and learning activities; (2) learning

resources used; (3) learning communication; (4) individual activities; (5) collaborative activities; and (6) assessments carried out. The whole set of activities must refer to a synchronous and asynchronous environment. Because students must be given autonomy in learning as much as possible¹⁵.

Project-based Instructional Design

The national education program requires students to acquire new skills in order to engage in meaningful social activities and collaborate effectively to solve real-world problems. This necessitates the integration of these new activities and values into the existing curriculum¹⁶. Project-based learning is an instructional approach that places emphasis on students' comprehension of concepts, principles, investigations, decision-making, and the creation of tangible products. This method is suitable for a variety of disciplines as it enhances critical thinking skills¹⁷. Project-based learning promotes the establishment of learning environments where students can actively engage in discussions and participate and suggests the use of these environments to stimulate students' interest in learning through the use of probing questions that prompt a range of learning activities. The challenges presented by the projects require students to ask and define questions, gather data, collaborate in learning, and produce tangible outcomes, all of which foster their creative thinking abilities. Diverse learning

⁹ Owen H. T. Lu and others, 'Applying Learning Analytics for the Early Prediction of Students' Academic Performance in Blended Learning', *Journal of Educational Technology & Society*, 21.2 (2018), 220–32.

¹⁰ Zahid Zufar At Thaariq and Agus Wedi, 'Model Adaptive Blended Curriculum (ABC) Sebagai Inovasi Kurikulum Dalam Upaya Mendukung Pemerataan Pendidikan', *Jurnal Kiprah*, 8.2 (2020), 91–104 <<https://doi.org/10.31629/kiprah.v8i2.2002>>.

¹¹ Uwes Anis Chaeruman, 'Ruang Belajar Baru Dan Implikasi Terhadap Pembelajaran Di Era Tatanan Baru', *Kwangsan*, 8.1 (2020), 142–53.

¹² Chantelle Bosch, Elsa Mentz, and Gerda Marie Reitsma, 'Integrating Cooperative Learning into the Combined Blended Learning Design Model: Implications for Students' Intrinsic Motivation', *International Journal of Mobile and Blended Learning (IJMBL)*, 11.1 (2019), 58–73 <<https://doi.org/10.4018/IJMBL.2019010105>>.

¹³ Yotam Hod, Kate Bielaczyc, and Dani Ben-Zvi, 'Revisiting Learning Communities: Innovations in Theory and Practice', *Instructional Science*, 46 (2018), 1–18 <<https://doi.org/10.1007/s11251-018-9467-z>>.

¹⁴ Tan Jin, Yanfang Su, and Jun Lei, 'Exploring the Blended Learning Design for Argumentative Writing', *Language Learning & Technology*, 24.2 (2020), 23–24.

¹⁵ Zahid Zufar At Thaariq and Rista Anggraini, 'Pengejawantahan blended learning untuk mendukung kultur lingkungan belajar berbasis kehidupan pasca pandemi', *Jurnal Teori dan Praksis Pembelajaran IPS*, 6.2 (2021), 103–16.

¹⁶ Domenico Lembo and Mario Vacca, 'Project Based Learning + Agile Instructional Design = EXtreme Programming Based Instructional Design Methodology for Collaborative Teaching', *Department of Computer and System Sciences Antonio Ruberti Technical Reports*, 4.8 (2012) <https://rosa.uniroma1.it/rosa00/index.php/dis_technical_reports/article/view/10089> [accessed 22 February 2023].

¹⁷ Dedi Kuswandi, Ence Surahman, and others, 'K-Means Clustering of Student Perceptions on Project-Based Learning Model Application', in *2018 4th International Conference on Education and Technology (ICET)*, 2018, pp. 9–12 <<https://doi.org/10.1109/ICEAT.2018.8693932>>.

strategies have demonstrated the ability to nurture students' creativity. As digital technology continues to advance, instructional strategies and tools have evolved, and the focus on creativity must also adapt to these changes.

Project-based learning cultivates students' capacity to operate effectively in professional settings. It is characterized by a learner-centered model that emphasizes the construction of knowledge through collaborative group work¹⁸. This approach involves students applying their existing knowledge to real-world scenarios, with an emphasis on producing a final project as the primary assessment tool. Fostering the development of essential skills within authentic contexts that promote problem-solving and creativity, instructional tasks are designed around open-ended questions.

This theoretical framework aligns with educational methodologies that place student learning within meaningful and genuine tasks. These tasks often mirror real-world scenarios, requiring students to take on the roles of adults or professionals as they respond to guiding questions, solve problems, or create products. As students engage in these active learning activities, educators transition into the roles of facilitators, mentors, and collaborative partners¹⁹. The emphasis is on participants working together to achieve a shared objective through cooperation. As students engage in a project, they may identify issues that require resolution to construct and present a final product in response to a guiding question. Within the context of project-based learning, peer feedback has the potential to support the learning process in various ways. Peer evaluation of project drafts can assist learners in reflecting on their own work and enhancing their

project performance. By exploring the interplay between the learning environment and students' behavior, cognition, and motivation, we can enhance our comprehension of how learning is linked to students' development as self-regulated learners.

Gamification

The proliferation of educational experiences that propose the application of active methodologies in the teaching-learning process has sparked academic interest from the research community. In relation to gamification, there are many practices that introduce, in one way or another, elements of (video) games in educational contexts to increase student motivation and engagement. Interest in studying the implications of gamification processes in different stages of education to determine their impact and suitability has led to an increase in scientific publications in recent years. As such, the difficulties that currently remain in clearly defining what gamification is, a term that is often misinterpreted as (video) game-based learning, when associated with its gaming roots or with the concept of playful learning, have led to a massification of studies in this area²⁰.

Gamification is not related to gaming; rather, it is simply the use of gaming elements in non-gaming situations. While the primary purpose of these games is entertainment, it is widely accepted that there is significant interest in utilizing their potential for educational purposes²¹. Gamification involves the application of game design techniques and elements in non-game settings to enhance user engagement and retention. When appropriately utilized, gamification can serve as an engaging and effective tool, particularly in

¹⁸ Mona A. Alromaih, Sabah A. Elsayed, and Essa A. Alibraheim, 'Study of Project-Based Learning to Improve the Instructional Design Process of Pre-Service Early Childhood Teachers', *International Journal of Information and Education Technology*, 12.12 (2022).

¹⁹ Anissa Lokey-Vega, Jo Williamson, and Kimberly Bondeson, 'A Lesson Structure and an Instructional Design Model for Project-Based Online Learning', *Journal of Online Learning Research*, 4.3 (2018), 327–45.

²⁰ Alberto González-Fernández, Francisco-Ignacio Revuelta-Domínguez, and María Rosa Fernández-Sánchez, 'Models of Instructional Design in Gamification: A Systematic Review of the Literature', *Education Sciences*, 12.1 (2022), 44 <<https://doi.org/10.3390/educsci12010044>>.

²¹ Hanaa Abdulaheem Yamani, 'A Conceptual Framework for Integrating Gamification in Elearning Systems Based on Instructional Design Model', *International Journal of Emerging Technologies in Learning (Online)*, 16.4 (2021), 14.

addressing the well-documented issue of student motivation within the education system. By implementing gamification in educational environments to increase student motivation and engagement, there is a strong likelihood of enhancing the quality of education.

Gamification overlaps with other game-related educational interventions, including game-based learning, serious games, and learning by design, each of which values different aspects of play and tends to approach play and learning from different points of departure²². In the context of an instructional setting, these elements are designed to engage learners in learning to achieve the learning objectives that have been set. Based on previous research, gamification is able to foster and increase motivation and provide a good learning experience with the right design²³.

Instructional Modules

When teachers use inappropriate teaching materials in every lesson, students struggle to understand the conveyed message. The role of teaching materials will not be apparent if they do not align with the formulated instructional objectives. If their use is not in accordance with the instructional objectives, the teaching materials cannot support the learning process^{24, 25}. This has revealed the construction of instructional design development that can be used through the preparation of devices, one of which is a module. Modules are commonly used to support

independent learning²⁶. This is done as a process that can potentially act as a "substitute" facilitator in the absence of teachers or peers²⁷.

According to certain perspectives, the concept of learning with modules involves students engaging in learning activities under the guidance of teachers, utilizing module-based resources to enhance the attainment of instructional goals in a more efficient and effective manner. Using modules as individualized media has several advantages: (1) students can learn anytime and anywhere; (2) learning is done step by step²⁸; and (3) students can learn at their own pace. Furthermore, there are also disadvantages to using modules, including the fact that they can only be utilized by students who possess strong reading skills, and that effective learning requires students to already have an awareness of learning as a process of changing behavior due to experience²⁹.

Specialized training for individuals in particular fields could be provided through the creation of additional educational modules. These modules have the potential to integrate knowledge and skills from multiple disciplines, serving as interdisciplinary educational resources for upcoming students. The study from Yulianto³⁰ revealed that modules can increase

²⁶ Zahid Zufar At Thariq, *Media Pembelajaran Abad 21*, ed. by Dedi Kuswandi (Banyumas: Pena Persada, 2022).

²⁷ Md Abdullah Al Mamun, Gwendolyn Lawrie, and Tony Wright, 'Instructional Design of Scaffolded Online Learning Modules for Self-Directed and Inquiry-Based Learning Environments', *Computers & Education*, 144 (2020), 103695
<<https://doi.org/10.1016/j.compedu.2019.103695>>.

²⁸ Arie Purwa Kusuma, 'Implementasi Model Pembelajaran Student Teams Achievement Division Dan Team Assisted Individualization Ditinjau Dari Kemampuan Spasial Siswa', *Al-Jabar: Jurnal Pendidikan Matematika*, 8.2 (2017), 135–44
<<https://doi.org/10.24042/ajpm.v8i2.1586>>.

²⁹ Vigih Hery Kristanto, 'Peningkatan Prestasi Belajar Matematika Melalui Penerapan Lesson Plan Berbasis Multiple Intelligence', *Al-Jabar: Jurnal Pendidikan Matematika*, 8.1 (2017), 25–34
<<https://doi.org/10.24042/ajpm.v8i1.598>>.

³⁰ Muhamad Fahmi Yulianto Yulianto, 'Pengembangan E-Modul Berbasis Flipbook Maker Muatan Matematika Materi Pecahan Dan Pengubahan Bentuk Pecahan Di Kelas 4 Sekolah Dasar / Muhamad Fahmi

²² Aaron Chia Yuan Hung, 'A Critique and Defense of Gamification.', *Journal of Interactive Online Learning*, 15.1 (2017).

²³ Yerry Soepriyanto and others, *Gamification Melalui Sipejar Sebagai Inovasi Pembelajaran Pemrograman Visual* (Malang: Universitas Negeri Malang, 25 November 2021) <<http://repository.um.ac.id/1507/>> [accessed 22 February 2023].

²⁴ Rika Rahmawati, Fitria Lestari, and Rofiqul Umam, 'Analysis of the Effectiveness of Learning in the Use of Learning Modules Against Student Learning Outcomes', *Desimal: Jurnal Matematika*, 2.3 (2019), 233–40
<<https://doi.org/10.24042/djm.v2i3.4557>>.

²⁵ Walter Dick, Lou Carey, and James Carey, *The Systematic Design of Instruction*, 8th edition (Boston: Pearson, 2014).

students' insight into teaching materials related to the material they learn. This indicates that modules are still a trend in instructional design development.

Computer-assisted Instruction

As technology continues to revolutionize the way people receive and interact with information, computer-assisted instruction is emerging as an innovative learning tool. This type of instruction combines various multimedia elements, such as graphics, audio, interactive activities, or video, to present information in a more engaging way. With its ability to recognize different learning styles, provide personalized feedback, and offer a safe environment for students to explore and practice, computer-assisted learning can greatly benefit students if implemented correctly. Computer-assisted teaching in modern classrooms has proven to increase student engagement and enhance their overall understanding of the subject matter. This type of instruction should be used more frequently because it improves memory through fun activities and allows teachers to assess student performance in real-time.

Computers provide a wide array of instructional control options for designers of computer-assisted instruction. The characteristics of the learning task and the learners themselves influence the availability and types of instructional controls. The process of developing computer-assisted instruction involves identifying objectives, translating them into sequential instructional steps, and describing learner characteristics, similar to any other development process. However, when considering learner characteristics in the context of computer-assisted instruction, developers must gather information about learners' computer proficiency, such as their familiarity with the keyboard and their level of computer understanding and anxiety. The features offered by computers

confer advantages for instruction, particularly in terms of learner performance.

Computer-assisted instruction is a potential alternative that can positively influence student learning outcomes. Furthermore, the software can utilize various media formats, including video, audio, games, quizzes, and more, to engage students. It also has the capability to gather data from student interactions, such as assessment results and software interactions, which can then be used to determine the most suitable material to present to students³¹.

Simulation-based Instruction

The education system has undergone dramatic changes in the 21st century with the introduction of new technologies and learning methods. One such innovation is the use of simulation-based learning to support student learning. Simulation-based learning offers an immersive educational experience that allows students to engage in real-world situations while surrounded by a safe space of experimentation and guidance. With its blend of applied knowledge, collaborative problem solving, and critical thinking activities, simulation-based learning is ideally suited to drive meaningful learning experiences that prepare students for success in the modern world.

However, the relative merits of different simulation interventions remain unknown. As the advantages of one simulator over another are context-specific (e.g., a particular simulator may be more or less effective depending on the learning objectives and educational context), it makes sense to focus on the instructional design features that define effective simulation learning-active materials or mechanisms. A comprehensive synthesis of evidence would be timely and useful for educators. Prominent individuals in the simulation community reinforce this use of simulation by presenting and publicizing this form

Yulianto' (unpublished diploma, Universitas Negeri Malang, 2021) <<http://repository.um.ac.id/192899/>> [accessed 22 February 2023].

³¹ Thomas Kaye and Melanie Ehren, 'Computer-Assisted Instruction Tools: A Model to Guide Use in Low- and Middle-Income Countries.', *International Journal of Education and Development Using Information and Communication Technology*, 17.1 (2021), 82–99.

of learning without a peer review process from those with extensive educational backgrounds, particularly in instructional design. For those newer to the simulation community, this form of simulation became the only one they knew, hence the standard of practice or theory espoused and used

Conclusion

Through this study, it can be concluded that the current instructional design development trend has led to (1) online learning, (2) blended learning/instruction, (3) project-based learning, (4) gamification, (5) learning modules, (6) computer-assisted learning, and (7) simulation-based learning. Therefore, in the future, there needs to be a broad follow-up on this understanding, especially for educators when designing a lesson in the classroom. Hopefully, through this understanding, it can build a better quality of instruction than before.

In the realm of instructional design, the author advocates for educators to fully embrace emerging trends. These include the use of online learning platforms for increased accessibility, blended learning to combine physical and digital learning, project-based learning to foster creativity, and gamification to add an element of enjoyment to the learning process. Furthermore, diverse tools such as learning modules, computer-assisted learning, and simulation-based learning are recommended to accommodate various learning preferences. The author also offers advice to fellow instructional designers, emphasizing the importance of grounding work in the practical realities of educational settings, embracing an interdisciplinary approach, staying informed about emerging technologies and pedagogical theories, and prioritizing accessibility and inclusivity in designs. The ultimate goal is to leverage these trends not for novelty's sake but to collectively enhance the quality of instruction and contribute to a learning environment that is engaging, inclusive, and effective.

References

Books

- Dick, Walter, Lou Carey, and James Carey, *The Systematic Design of Instruction*, 8th edition (Boston: Pearson, 2014)
- Thaariq, Zahid Zufar At, *Media Pembelajaran Abad 21*, ed. by Dedi Kuswandi (Banyumas: Pena Persada, 2022)

Journals

- Alromaih, Mona A., Sabah A. Elsayed, and Essa A. Alibraheim, 'Study of Project-Based Learning to Improve the Instructional Design Process of Pre-Service Early Childhood Teachers', *International Journal of Information and Education Technology*, 12.12 (2022)
- Aslamiyah, Tsuwaybah Al, Punaji Setyosari, and Henry Praherdhiono, 'Blended Learning Dan Kemandirian Belajar Mahasiswa Teknologi Pendidikan', *JKTP: Jurnal Kajian Teknologi Pendidikan*, 2.2 (2019), 109–14 <<https://doi.org/10.17977/um038v2i22019p109>>
- Bosch, Chantelle, Elsa Mentz, and Gerda Marie Reitsma, 'Integrating Cooperative Learning into the Combined Blended Learning Design Model: Implications for Students' Intrinsic Motivation', *International Journal of Mobile and Blended Learning (IJMBL)*, 11.1 (2019), 58–73 <<https://doi.org/10.4018/IJMBL.2019010105>>
- Chaeruman, Uwes Anis, 'Ruang Belajar Baru Dan Implikasi Terhadap Pembelajaran Di Era Tatanan Baru', *Kwangsan*, 8.1 (2020), 142–53
- Chaeruman, Uwes Anis, and Santi Maudiarti, 'Quadrant of Blended Learning: A Proposed Conceptual Model for Designing Effective Blended Learning', *Jurnal Pembelajaran Inovatif*, 1.1 (2018), 1–5
- Göksu, Idris, Kursat Volkan Özcan, Recep Çakir, and Yuksel Göktas, 'Content Analysis of Research Trends in Instructional Design Models: 1999-2014', *Journal of Learning Design*, 10.2 (2017), 85–109
- González-Fernández, Alberto, Francisco-Ignacio Revuelta-Domínguez, and María Rosa Fernández-Sánchez, 'Models of Instructional Design in Gamification: A Systematic Review of the Literature',

- Education Sciences*, 12.1 (2022), 44
<<https://doi.org/10.3390/educsci12010044>>
- Havemann, Leo, Elizabeth Charles, Sarah Sherman, Scott Rodgers, and Joana Barros, 'A Multitude of Modes: Considering "Blended Learning" in Context' (presented at the CDE RIDE conference 2019, London, 2019) <<https://london.ac.uk/centre-distance-education/cde-activities/cde-events#ride-2019-conference>> [accessed 22 February 2023]
- Hod, Yotam, Kate Bielaczyc, and Dani Ben-Zvi, 'Revisiting Learning Communities: Innovations in Theory and Practice', *Instructional Science*, 46 (2018), 1–18 <<https://doi.org/10.1007/s11251-018-9467-z>>
- Hung, Aaron Chia Yuan, 'A Critique and Defense of Gamification.', *Journal of Interactive Online Learning*, 15.1 (2017)
- Jin, Tan, Yanfang Su, and Jun Lei, 'Exploring the Blended Learning Design for Argumentative Writing', *Language Learning & Technology*, 24.2 (2020), 23–24
- Kaye, Thomas, and Melanie Ehren, 'Computer-Assisted Instruction Tools: A Model to Guide Use in Low-and Middle-Income Countries.', *International Journal of Education and Development Using Information and Communication Technology*, 17.1 (2021), 82–99
- Kristanto, Vigh Hery, 'Peningkatan Prestasi Belajar Matematika Melalui Penerapan Lesson Plan Berbasis Multiple Intelligence', *Al-Jabar: Jurnal Pendidikan Matematika*, 8.1 (2017), 25–34 <<https://doi.org/10.24042/ajpm.v8i1.598>>
- Kusuma, Arie Purwa, 'Implementasi Model Pembelajaran Student Teams Achievement Division Dan Team Assisted Individualization Ditinjau Dari Kemampuan Spasial Siswa', *Al-Jabar: Jurnal Pendidikan Matematika*, 8.2 (2017), 135–44 <<https://doi.org/10.24042/ajpm.v8i2.1586>>
- Kuswandi, Dedi, Citra Kurniawan, Fikri Aulia, Agus Wedi, Hutkemri Zulnaidi, Muhammad Zidni Ilman Nafi'a, and others, 'Visualizing Trend of 21st-Century Curriculum: A Bibliometric Analysis' (presented at the 7th International Conference on Education and Technology (ICET 2021), Atlantis Press, 2021), pp. 38–44 <<https://doi.org/10.2991/assehr.k.211126.033>>
- Kuswandi, Dedi, Ence Surahman, Zahid Zufar At Thaariq, and Mahmuda Muthmainnah, 'K-Means Clustering of Student Perceptions on Project-Based Learning Model Application', in *2018 4th International Conference on Education and Technology (ICET)*, 2018, pp. 9–12 <<https://doi.org/10.1109/ICEAT.2018.8693932>>
- Lembo, Domenico, and Mario Vacca, 'Project Based Learning + Agile Instructional Design = EXtreme Programming Based Instructional Design Methodology for Collaborative Teaching', *Department of Computer and System Sciences Antonio Ruberti Technical Reports*, 4.8 (2012) <https://rosa.uniroma1.it/rosa00/index.php/dis_technical_reports/article/view/10089> [accessed 22 February 2023]
- Lokey-Vega, Anissa, Jo Williamson, and Kimberly Bondeson, 'A Lesson Structure and an Instructional Design Model for Project-Based Online Learning', *Journal of Online Learning Research*, 4.3 (2018), 327–45
- Lu, Owen H. T., Anna Y. Q. Huang, Jeff C.H. Huang, Albert J. Q. Lin, Hiroaki Ogata, and Stephen J. H. Yang, 'Applying Learning Analytics for the Early Prediction of Students' Academic Performance in Blended Learning', *Journal of Educational Technology & Society*, 21.2 (2018), 220–32
- Mamun, Md Abdullah Al, Gwendolyn Lawrie, and Tony Wright, 'Instructional Design of Scaffolded Online Learning Modules for Self-Directed and Inquiry-Based Learning Environments', *Computers & Education*, 144 (2020), 103695 <<https://doi.org/10.1016/j.compedu.2019.103695>>
- Merrill, M. David, Leston Drake, Mark J. Lacy, Jean Pratt, and the ID₂ Research Group,

- 'Reclaiming Instructional Design', *Educational Technology*, 36.5 (1996), 5–7
- Rahmawati, Rika, Fitria Lestari, and Rofiqul Umam, 'Analysis of the Effectiveness of Learning in the Use of Learning Modules Against Student Learning Outcomes', *Desimal: Jurnal Matematika*, 2.3 (2019), 233–40
<<https://doi.org/10.24042/djm.v2i3.4557>>
- Reigeluth, Charles M., 'What Is Instructional-Design Theory and How Is It Changing?', in *Instructional-Design Theories and Models: A New Paradigm of Instructional Theory* (Routledge, 1999)
- Soepriyanto, Yerry, Dedi Kuswandi, Citra Kurniawan, Remy Willyam Delanur Hamudi, Akhmad Arifudin, and Nunung Nindigraha, *Gamification Melalui Sipejar Sebagai Inovasi Pembelajaran Pemrograman Visual* (Malang: Universitas Negeri Malang, 25 November 2021)
<<http://repository.um.ac.id/1507/>> [accessed 22 February 2023]
- Sweller, John, 'Instructional Design', in *Encyclopedia of Evolutionary Psychological Science*, ed. by Todd K. Shackelford and Viviana A. Weekes-Shackelford (Cham: Springer International Publishing, 2021), pp. 4159–63
<https://doi.org/10.1007/978-3-319-19650-3_2438>
- Thaariq, Zahid Zufar At, and Rista Anggraini, 'Pengejawantahan blended learning untuk mendukung kultur lingkungan belajar berbasis kehidupan pasca pandemi', *Jurnal Teori dan Praksis Pembelajaran IPS*, 6.2 (2021), 103–16
- Thaariq, Zahid Zufar At, and Agus Wedi, 'Model Adaptive Blended Curriculum (ABC) Sebagai Inovasi Kurikulum Dalam Upaya Mendukung Pemerataan Pendidikan', *Jurnal Kiprah*, 8.2 (2020), 91–104
<<https://doi.org/10.31629/kiprah.v8i2.2002>>
- Yamani, Hanaa Abdulraheem, 'A Conceptual Framework for Integrating Gamification in Elearning Systems Based on Instructional Design Model', *International Journal of Emerging Technologies in Learning (Online)*, 16.4 (2021), 14
- Yulianto, Muhamad Fahmi Yulianto, 'Pengembangan E-Modul Berbasis Flipbook Maker Muatan Matematika Materi Pecahan Dan Pengubahan Bentuk Pecahan Di Kelas 4 Sekolah Dasar / Muhamad Fahmi Yulianto' (unpublished diploma, Universitas Negeri Malang, 2021)
<<http://repository.um.ac.id/192899/>> [accessed 22 February 2023]