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Instructional design research trends towards digital transformation of education systems in ASEAN

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ABSTRACT

The curriculum implementation in ASEAN countries is interesting to examine, especially in order to achieve the direction of the digital transformation roadmap of the education system. Research on instructional design can be used as one of the parameters to understand how the general description of implementation achieves curriculum goals. This study aims to examine instructional design research in ASEAN countries during the period 2018-2024 on the implementation of the national curriculum towards the digital transformation of the education system through (1) investigating the general description of instructional design research, (2) examining research characteristics from aspects of research objectives, (3) explaining the implications of findings both theoretically and practically. The documentation study was conducted through bibliometric analysis of articles with keywords against article titles containing the phrase "instructional design" in ASEAN countries from the Scopus database, which produced as many as 37 selected articles during the 2018-2024 period. The results show that the general description and direction of instructional design research objectives in ASEAN countries have been presented comprehensively. Besides that, the theoretical and practical implications of instructional design research on the road map for digital transformation of education systems in ASEAN have been considered.

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ABSTRAK

Implementasi kurikulum di negara ASEAN menarik diteliti khususnya dalam upaya mencapai arah peta jalan transformasi digital sistem pendidikan. Riset tentang instructional design bisa dijadikan salah satu parameter untuk memahami bagaimana gambaran umum implementasi untuk mencapai tujuan kurikulum. Penelitian ini bertujuan untuk mengkaji riset instructional design di negara ASEAN selama periode 2018-2024 pada implementasi kurikulum nasional dalam menuju transformasi digital sistem pendidikan, melalui: (1) investigasi gambaran umum penelitian instructional design, (2) mengkaji karakteristik penelitian dari aspek tujuan penelitian, (3) menjelaskan implikasi temuan baik secara teoritis maupun praktis. Studi dokumentasi dilakukan melalui analisis bibliometrik terhadap artikel dengan kata kunci terhadap judul artikel yang mengandung frasa "instructional design" di negara ASEAN, dari database scopus yang menghasilkan sebanyak 37 artikel terpilih selama periode tahun 2018-2024. Hasil menunjukan bahwa gambaran umum dan arah tujuan penelitian instructional design di negara ASEAN telah tersaji secara komprehensif, selain itu implikasi teoritis dan praktis dari riset instructional design terhadap peta jalan transformasi digital sistem pendidikan di ASEAN sudah dianggap sejalan.

Kata Kunci: *bibliometrik; desain pembelajaran; kurikulum; pendidikan; transformasi digital*

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INTRODUCTION

The Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) has initiated coordination with ASEAN member countries to develop a Roadmap for the Digital Transformation of Education Systems in ASEAN as a step in improving the education sector, which was conveyed at the Regional Consultation Forum or Consultation Meeting on Monday (27-6-2023). The draft Roadmap for Digital Transformation of Education Systems in ASEAN (Wisnubroto, 2023) explained that seven main components will be focus areas to be carried out jointly by ASEAN member countries, four of which are (1) Improving teacher skills, (2) Aligning curriculum and teaching with digital transformation, (3) Ensuring quality and accessible digital learning resources, (4) Utilizing digital assessment. Therefore, the commitment of ASEAN countries is needed to realize this, including efforts that have been, are, and will be carried out related to the implementation of education curricula in their respective countries.

One form of curriculum implementation at the school level, especially in the classroom, is to see how the instructional design is implemented. Therefore, it is essential to examine the direction of research objectives on instructional design in ASEAN countries to implement curriculum goals that will achieve the digital transformation roadmap of the education system in ASEAN. Curriculum and Instructional Design can be likened to two sides of the coin that cannot be separated from each other in various aspects, especially from the aspect of implementation at the grade level, where the curriculum, after being developed, is implemented by providing general direction and learning outcomes in each phase. In contrast, instructional design transforms these learning outcomes into concrete and planned learning experiences.

Teacher skills in designing classroom instruction greatly determine the success of learning in the classroom, which will significantly impact student motivation, teacher performance improvement, and learning outcomes. This has also been proven by previous researchers who examined teacher skills, namely Azmi and Ummah (2021) and Chrisvianty et al. (2020), who found a significant influence on teacher skills in teaching, managing classes, or evaluating learning success. In addition, instructional design is also related to developing teaching materials from learning resources that follow curriculum needs, as well as evaluation mechanisms for learning activities that have been implemented. Learning resources have a significant role in producing suitable teaching materials to improve the quality of learning, which is one of the objectives of instructional design; this is also reinforced by previous research, namely from Samsinar (2019) and Supriadi (2017), explained the critical role of quality learning resources and their utilization.

Similarly, the learning evaluation process, as an effort to measure the success of learning, needs to be done well so that the evaluation results can be used as a basis for subsequent learning improvements. Based on the above, the research question asked is how the trend of instructional design research in ASEAN countries is to answer challenges related to the Digital Transformation of the Education System. This study generally aims to examine instructional design research in ASEAN countries during the period 2018-2024 on the implementation of the national curriculum towards the digital transformation of the education system through (1) investigating the overview of instructional design research, (2) examining research characteristics from aspects of research objectives, (3) explaining the implications of findings both theoretically and practically on the road map for the digital transformation of education systems in ASEAN.

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LITERATURE REVIEW

Curriculum

A country's curriculum describes the direction of national education, in Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional "*Kurikulum adalah seperangkat rencana dan pengaturan mengenai tujuan, isi, danbahan pelajaran serta cara yang digunakan sebagai pedoman penyelenggaraan kegiatan pembelajaran untuk mencapai tujuan pendidikan tertentu*". Curriculum experts also emphasize this definition, as explained by Tyler and Taba (Suasti, 2021). According to Tyler, the curriculum is all learning experiences planned and directed by the school to achieve school educational goals. In contrast, according to Taba, the curriculum is a learning plan, which includes setting goals and objectives, selecting and organizing content, implications of learning and teaching patterns, and outcome evaluation programs.

From these three definitions, it can be explained that the objectives in the curriculum become one of the references in the implementation process in schools, especially at the grade level. Therefore, instructional activities in the classroom must be in line with curriculum objectives. Alignment can include learning resources, learning activities, teaching and learning processes, and evaluations that need to be supported by other supporting resources such as teacher skills in managing instruction, infrastructure, and digital technology support. To ensure that the objectives of the curriculum are correctly implemented, it is necessary to evaluate the implementation of the curriculum, especially at the school level, including through the implementation of classroom learning. One of the curricula at the school level is implemented through interaction between teachers and students in learning activities, as also conveyed by Davis (2016), which mentions that curriculum is concerned with what the teacher will teach or what students should learn, while instruction refers to how the teacher teaches or how students will experience learning. Based on this statement, instructional design is essential in creating quality learning, increasing student motivation, and creating learning experiences.

Instructional Design

Learning is an interaction activity between teachers, students, and learning resources in a learning environment to achieve specific goals. Therefore, it is necessary to design appropriate instruction to achieve learning objectives. The relationship between learning design and instructional design has been explained comprehensively by Jung (2022), who mentions that both terms refer to the same thing related to learning or teaching settings. However, it is mentioned that instructional design focuses more on efforts to improve learning, including analysis of problems in learning and performance, as well as design, development, implementation, evaluation, and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings. Meanwhile, other researchers have also conducted in-depth analyses related to the difference between learning design and instructional design, one of which was conducted by Maroungkas (2023), which conveyed the conclusion that instructional design is about developing, assessing, and evaluating instruction while learning design is more about learner engagement and experience, which can be assessed and improved with analytical and technological approaches. Thus, instructional design can be defined as an effort to create activities and learning environments to improve the quality of learning, which is arranged systematically from design, development, implementation, evaluation, and management.

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The development of instructional design is strongly influenced by technological developments that can be used as learning support, meaning that every time a supporting technology is found at that time, instructional design is changed towards a better, more effective, and/or broader reach. The history of the development of instructional design is also conveyed in detail by Fries (2021), which is explained as follows: 1) At the beginning of the 20th century, with the discovery of optics and electricity, there was an adoption of technological innovations in learning by teachers where still images were projected, films and audio recordings, 2) in the 1930s and 1950s where radio and television broadcasts were discovered, this media was used as a way to reach students inside and outside school With educational audiovisuals, 3) in the 1990s learning was influenced by the development of computers with delivery and interactive capabilities in processing and presenting information, 4) in 1995 the development of network technology and the internet began to give birth to the mode of distance education, and 5) Since the 1980s instructional system design has become a broad paradigm for instructional design.

Curriculum and Instructional Design

Referring to both definitions of curriculum and instructional design, it does not seem very easy to distinguish between curriculum and instruction. In other words, both have vital intersections, just as stated by Carnevale et al. (2019), who explained that the search to clarify the meaning of curriculum reveals uncertainty about the difference between curriculum and instruction and their relationship to each other, in simple terms. Curriculum can be viewed as what is taught, and instruction is the means to teach what is taught. Even more simply, curriculum can be understood as the "what," or intention, and instruction as the "how." or means. Based on this, examining the trend of instructional design research in ASEAN countries with the use of Bibliometric and R Studio tools, we will indirectly get an overview of information about how the curriculum is implemented in the country, which then the findings will be used as a basis to answer the extent to which curriculum implementation is in line with the direction of the Digital Transformation of Education Systems in ASEAN Countries.

METHODS

This research uses a descriptive qualitative approach through documentation studies using a systematic literature review. The process of collecting and analyzing data uses the stages of bibliometric analysis (Zupic & Čater, 2015), namely: 1) research design, 2) compilation of bibliometric data, 3) analysis, 4) visualization, and 5) interpretation.

Research Design

This study was designed to answer several research questions: (1) how is the general description of research on instructional design? (2) how is the research characteristic from the research objectives? (3) how are the implications of findings, both theoretically and practically, on the road map for the digital transformation of education systems in ASEAN?

Bibliometric Data Compilation

The data compilation stage uses stages that refer to Nobanee (2021), namely, data collection, data filtering, and data cleaning. Furthermore, the three stages will be explained as follows:

1. Data collection

    Data is collected from the Scopus database through the https://www.scoupus.com page,

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Search categories are filtered by article title, with the search keyword phrase being "instructional design". The 2018-2024 year range further filters it. The document type chosen was Article and Conference Article, the Source Type was Journal, with English category, and 358 documents were produced.

2. Data filtering
   At this stage, screening is carried out based on countries in the ASEAN region where only six countries appear: Indonesia, Thailand, Malaysia, Vietnam, Singapore, and the Philippines. The following query command is given:
   TITLE ("instructional design") AND PUBYEAR > 2017 AND PUBYEAR < 2025 AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (AFFILCOUNTRY , "Indonesia") OR LIMIT-TO (AFFILCOUNTRY , "Thailand") OR LIMIT-TO (AFFILCOUNTRY , "Malaysia") OR LIMIT-TO (AFFILCOUNTRY , "Singapore") OR LIMIT-TO (AFFILCOUNTRY , "Philippines") OR LIMIT-TO (AFFILCOUNTRY , "Viet Nam"))
   From the screening, 37 documents were finally produced.

3. Data cleansing
   Data cleaning is carried out at this stage to ensure that the downloaded data is appropriate and there are no information parameter errors; in this case, the data is clean to be done to the next stage.

RESULTS AND DISCUSSION

Results

The general description of the research is presented based on advanced data processing for analysis based on the following three stages of bibliometric analysis: analysis, visualization, and interpretation. To do that, the R Studio software tool is used, which is one of the software that has features to help analyze through visualization, making it easier for users to interpret. Data collected from the Scopus database through R Studio software is then exported into a text file with a *.bib extension. The file is uploaded, and data is explored through sharing service features that have been provided for analysis, visualization, and interpretation.

Overview of Instructional Design Research in ASEAN Countries

The overview presented is documents by country, primary information, annual scientific production, most relevant sources, sources' production over time, authors' production over time, most relevant affiliations, affiliations' production over time, word cloud, and thematic map. **Figure 1** presents information on the distribution of 37 selected documents based on ASEAN countries. 6 countries produced articles related to titles containing the phrase "instructional design" with the following distribution: Indonesia 19 documents, Thailand 7 documents, Malaysia 5 documents, Vietnam 3 documents, Singapore 2 documents, and Philippines 1 document.

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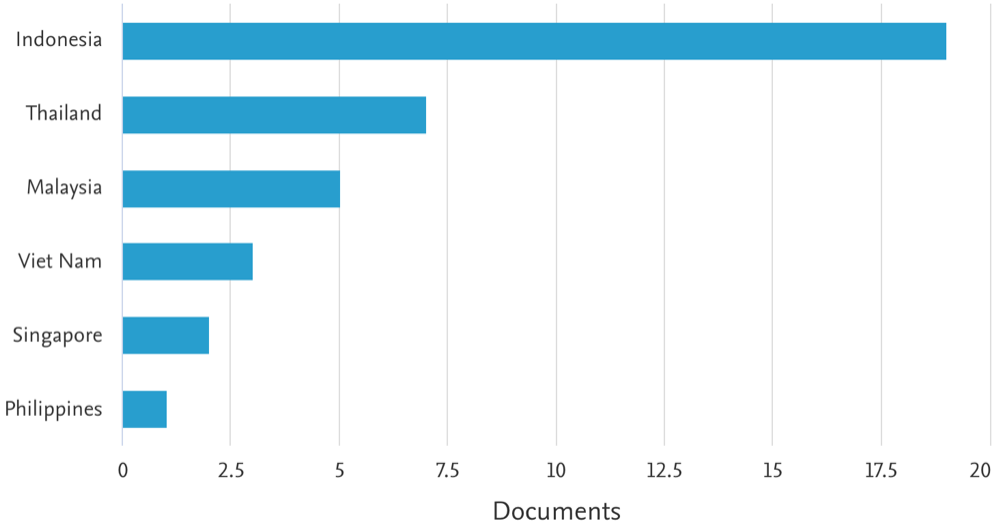

Figure 1. Documents by Country
Source: Results of Author Data Processing using R Studio

In **Table 1**, general information related to the search results of articles with titles containing the phrase "instructional design" in ASEAN countries in the 2018-2024 period includes the number of documents, as many as 37 articles, the number of authors involved 107 authors, and the average citation per document as much as 8,784.

Table 1. General Information article title about Instructional Design in ASEAN countries

No	Description	Results
	MAIN INFORMATION ABOUT DATA	
1	Timespan	2018:2024
2	Sources (Journals, Books, etc)	30
3	Documents	37
4	Annual Growth Rate %	0
5	Document Average Age	3,38
6	Average citations per doc	8,784
7	References	0
	DOCUMENT CONTENTS	
8	Keywords Plus (ID)	56
9	Author's Keywords (DE)	124
	AUTHORS	
10	Authors	107
11	Authors of single-authored docs	6
	AUTHORS COLLABORATION	
12	Single-authored docs	7
13	Co-Authors per Doc	3,08
14	International co-authorships %	8,108
	DOCUMENT TYPES	
15	Article	37

Source: Results of Author Data Processing using R Studio

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Table 2 presents information related to the distribution of article occurrences in the 2018-2024 range from a total of 37 articles. It can be seen that article publication increased from 2018,2019 to 2020, while after that, it began to decline from 2021, 2022, 2023, and until the first two months of 2024.

Table 2. Annual Scientific Production

Year	Articles
2018	2
2019	9
2020	11
2021	4
2022	3
2023	6
2024	2

Source: Results of Author Data Processing using R Studio

Analysis, Visualization, and Interpretation

After the general description is presented, the next stage is to conduct a more detailed analysis to interpret the resulting visualization**. Figure 2** explains the number of articles produced from the first five journals that produced the highest number of articles over time. It can be seen that the highest article production was in the 2020s.

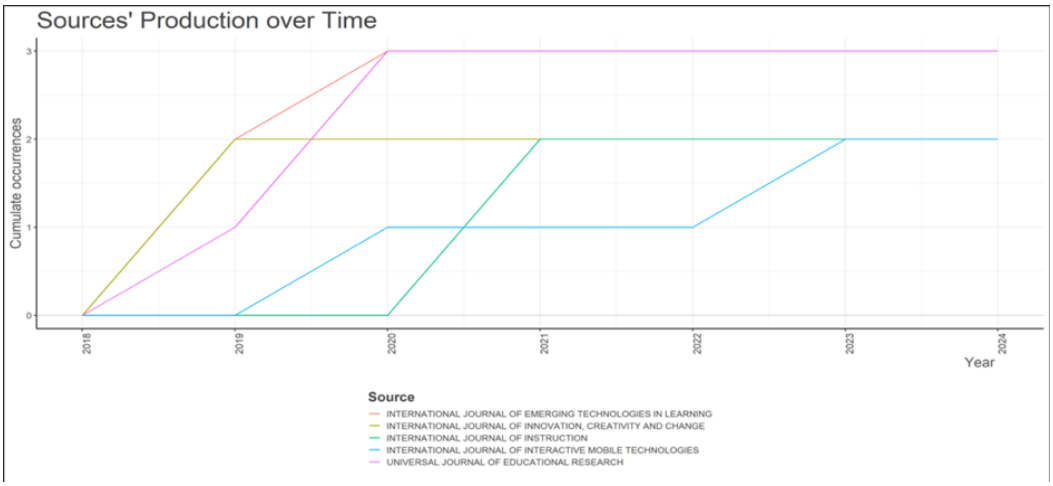

Figure 2. Sources' Production over Time
Source: Results of Author Data Processing using R Studio

Next, in **Figure 3**, explaining how article production by authors over time, this shows author productivity and publication patterns; this information also explains the contribution of authors in the field of instructional design research and productivity trends and describes who are the authors who have a significant influence based on their productivity in the range of 2018 to 2024.

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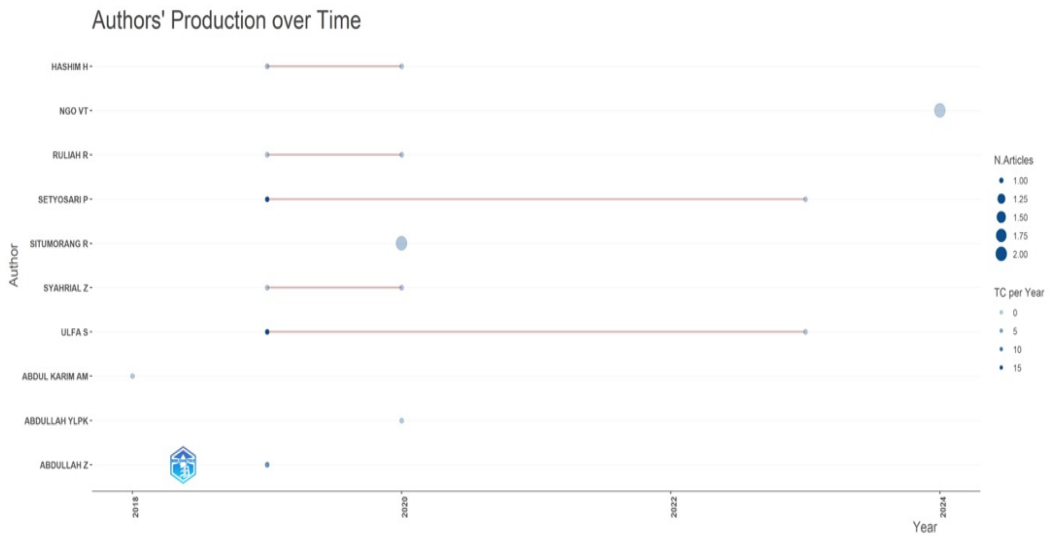

Figure 3. Authors' Production over Time
Source: Results of Author Data Processing using R Studio

While **Figure 4** presenting information related to article production by affiliates from time to time-related to the number of articles, affiliate contributions in the field of instructional design research, scientific production trends, and comparisons between affiliates in terms of publication, thus, the academic reputation of an affiliate, as well as growing research trends illustrated from the images presented in the range of 2018 to 2024.

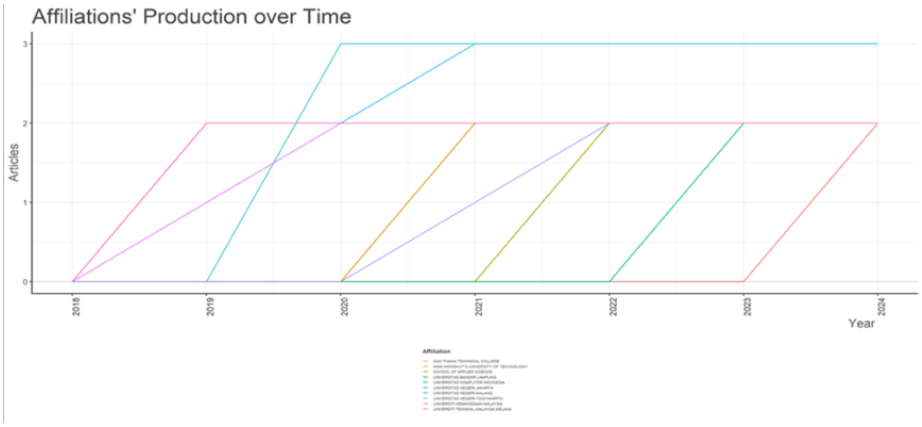

Figure 4. Affiliations' Production over Time
Source: Results of Author Data Processing using R Studio

In **Figure 5** Word Cloud visually represents the frequency of words emerging from the article. This gives an idea of the dominant topic or theme of the selected article. Words that appear are displayed more often at larger sizes in Word Cloud.

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Figure 5. Word Cloud
Source: Results of Author Data Processing using R Studio

In **Figure 6**, it can be seen that some dominant words appear, and then these words describe patterns or trends that appear in the article. The dominant words besides the word instructional design include curriculum, technology, learning, teaching, competence, and Human. The dominance of these words shows that research on instructional design is closely related to the terms of the words that appear, or it can also be said that research on instructional design tends to include discussions about topics related to the words that appear and, at the same time all these words have a role in explaining instructional design research.

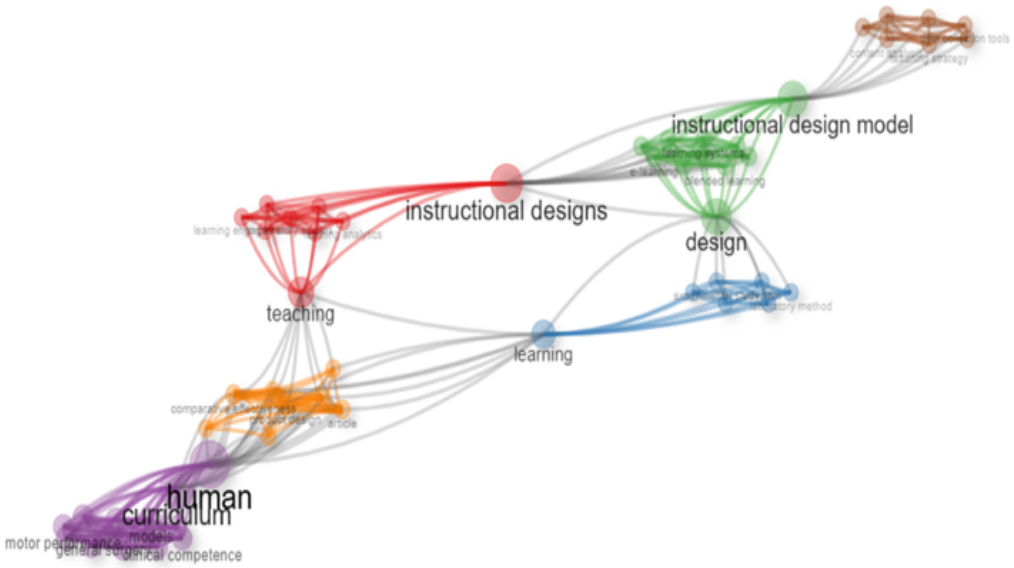

Figure 6. Thematic Map
Source: Results of Author Data Processing using R Studio

Figure 6, The thematic map depicts a visual representation of patterns and relationships between topics or themes emerging from the 37 selected articles, as well as relationships between words or concepts in

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the cluster, as well as core structures, including patterns of collaboration between authors, critical themes in instructional design research, over time, for example from **Figure 6**. It can be seen that the topic of instructional design is directly related to the topic of teaching, design, and instructional design models. Indirectly also related to learning topics, massive open online courses, and engagement. The topic of the instructional design model is directly related to the topic of information and communication technology, learning systems, mobile learning, blended learning, content analysis, data collection, and others. Based on this, it can be said that the research topic on instructional design is extensive and related to curriculum implementation, especially in improving the quality of learning supported by various kinds of technology.

Discussion

Characteristics of Instructional Design research from the aspect of Research Objectives

The purpose of the study is an essential aspect of understanding the direction of research conducted by the author; therefore, reviewing the purpose of the research becomes interesting. Analysis of the research objectives of 37 selected articles was carried out with the following steps: 1) reviewing the research objectives of each article by coding on each article and producing as many as 51 coding research objectives, meaning that there are articles that have more than one research objective. 2) categorize research objectives. Based on the results of the analysis of the 51 codes produced, seven categories of research objectives were produced, namely: planning, development, application, evaluation, influence, guidance, and improvement. 3) Generating themes from the results of the categorization of objectives, this theme is raised based on the description of research objectives that appear in each article and then processed in such a way as to produce themes in each predetermined category. **Figure 7** presents the percentage distribution of research objectives in instructional design research per category, as follows:

Figure 7. Presentation of Research Objectives per Category
Source: Author's Documentation 2024

The results of theme generation from the categorization process can be seen in **Table 3**. which explains the resulting themes along with articles that support themes related to instructional design research objectives from 37 selected articles. Thus, the seven themes of research objectives are spread across 37 articles, where one article has more than one theme.

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Table 3. Theme Research Objectives Instructional Design

No	Research Title Theme	Theme Description	Article	Total Article
1	Planning	1. Make proposals, reviews, introductions, and literature synthesis through integration with learning models, technology, media, MOOCs, and mobile. 2. To improve specific study skills and learning outcomes on certain subjects. 3. At various levels, both in school and college.	(Atisabda et al., 2019; Bahar et al., 2020; Eang & Na-Songkhla, 2020; Egcas & Oniego, 2019; Harpain et al., 2019; Lau et al., 2022; Nonthamand, 2020; Rafiq et al., 2019; Rajaratnam et al., 2021; Ruliah et al., 2020; Sakulwichitsintu, 2023; Supeno et al., 2019; Yusoff et al., 2018)	13
2	Development	1. Aimed at specific study skills. 2. At the school, college, and pre-service teacher levels, 3. Integration with models and learning. 4. Assisted or game-based, web, online, mobile blended learning, e-learning, and LMS. 5. Presence of instructional design instruments	(Atisabda et al., 2019; Dhaniawaty et al., 2023; Hanafi et al., 2020; Nugroho, 2023; Nurrijal et al., 2023; Purnamawati et al., 2018; Ruliah et al., 2019; Sangsawang, 2020; Siagian et al., 2020; Srikongchan et al., 2021; Suartama et al., 2019; Syahri et al., 2021; Thohir et al., 2021; Triastuti et al., 2022; Yenita et al., 2020; Yuliawan et al., 2020; Yusoff et al., 2018)	17
3	Application	1. Student literacy 2. Learning using video conferencing 3. Implementation of IDS in higher education	(Nonthamand, 2020; Shinta et al., 2023; Yusoff et al., 2018)	3
4	Evaluation	1. Perceptions of students and experts related to learning and / or teaching. 2. Literacy implementation 3. Potential use of learning analytics for instruction improvement in MOOCs 4. Selection of innovative and appropriate instructional models	(Ngo, 2024; Nonthamand, 2020; Sakulwichitsintu, 2023; Shukor & Abdullah, 2019)	4
5	Influence	1. The effect of the flipped classroom on practice skills 2. The effect of blended on student performance 3. The effect of collaborative IDS with the ASIE model on improving professional learning communities 4. The influence of mobile LMS on mentorship activities	(Abdullah & Hashim, 2020; Hanafi et al., 2020; Ngo, 2024a; Shinta et al., 2023; Vo et al., 2020)	5
6	Guidance	Guiding instructors or lecturers systematically in facilitating students to be skilled in critical thinking and creative thinking in the problem-solving process.	(Nurrijal et al., 2023)	1

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No	Research Title Theme	Theme Description	Article	Total Article
7	Increased	1. Learning skills, higher-order thinking, Professional Learning Community (PLC) 2. Target: Students with autism, Students College Students 3. Integration of technology to encourage creative instructional instruction in teaching and learning 4. Products: MOOC, modules, and teaching materials	(Abdullah & Hashim, 2020; Atisabda et al., 2019; Benjakul, 2023; Eang & Na-Songkhla, 2020; Egcas & Oniego, 2019; Mohd et al., 2019; Muthmainnah et al., 2022; Shukor & Abdullah, 2019)	8

Source: Author's Documentation 2024

Implications of Findings on the Digital Transformation Roadmap of Education Systems in ASEAN

In general, the direction of instructional design research objectives has direct and indirect implications for the roadmap of the digital transformation of education systems in ASEAN. These implications can be explained by referring to Table 3: (1) Improve teacher skills: Theoretically and practical research has led to improving teacher skills. This is shown by the many research implementations directly carried out in the environment. School will have an impact on increasing the insight of teachers in schools in improving skills. Several studies related to efforts to improve teacher skills carried out in schools include those conducted by Atisabda et al. (2019), showing that teachers have skills in integrating AR technology with student-centered learning strategies and in developing HOTS-based evaluation tools, while research conducted by Hendrowibowo & Kristanto (2024) mentions that there is a positive and substantial influence in improving the ability of students and teachers in designing lesson plans. This is in line with what has been researched by Nurrijal et al. (2023), which found that teacher skills increase in planning, implementing, and assessing learning. (2) Aligning curriculum and teaching with digital transformation: Many instructional design studies have theoretically and practically integrated instruction, learning, and/or teaching activities with technology. (3) Ensure quality and accessible digital learning resources. Some studies have implemented blended learning, where aspects of disseminating materials ready to be accessed anywhere and anytime are one of the main focuses. (4) Utilizing digital assessment: This aspect has not been seen in detail, but using LMS in several studies can indicate the need to maximize LMS features in managing assessments digitally.

CONCLUSION

Based on the results and discussions that have been described and concerning the objectives of the study, the following conclusions can be conveyed: In general, instructional design research continues to be carried out by researchers in ASEAN countries in the 2018-204 period by producing 37 selected articles from 6 ASEAN countries and 107 authors, an average citation per document of 8,784. The direction of instructional design research searched based on title keywords containing the phrase "instructional design" leads to 7 themes, namely: design (13 articles), development (17 articles), application (3 articles), evaluation (4 articles), influence (5 articles), guidance (1 article), and improvement (8 articles), this also shows that in one article can have more than one research objective. Instructional design research has implications both directly and indirectly for the achievement of the digital transformation roadmap of the education system in ASEAN, especially in 4 focuses out of 7 focuses, namely: (1) Improving teacher skills, (2) Aligning curriculum and teaching with digital transformation, (3) Ensuring quality and accessible digital learning resources, (4) Utilizing digital assessment. It is recommended to review more comprehensively,

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through advanced searches, not only on title keywords containing the phrase "instructional design" but can be reviewed from other aspects.

AUTHOR'S NOTE

The author declares that there is no conflict of interest regarding the publication of this article. The author confirms that the data and content of the article are free from plagiarism.

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