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A Review – The Influence of Games on Education Development in the Disruption Era

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ABSTRACT

Game is a platform that is commonly used by users in everyday life. Games are often used when someone is bored, bored, and mostly as a means of entertaining. But in the current era of disruption in technology, games are also used as learning media. Game-based learning is a learning concept that uses games as a tool to increase student involvement and motivation in learning. In game-based learning, games designed with learning objectives are called serious games. Serious games combine elements of fun and engaging games with learning objectives to create interactive, effective and engaging learning experiences for students. In serious games, students play games that have learning objectives, such as learning new skills, understanding complex concepts, or honing certain skills. Currently known as gamification in a learning. This paper will review several issues related to games in learning. The method used in finding several gap issues related to the author uses bibliometric techniques which are processed using bibliometric analysis. The author uses archival data from Scopus sources which review game technology in learning. The facts resulting from the analysis consist of 4 elements of discussion namely, technology, media, materials, methods, and the latest findings are on the data security side. This author obtains data related to the security side, namely in the user privacy section. This means that the discussion that will take place later will be the theme of games that discuss elements of data security.

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INTRODUCTION

Games are included in the field of multimedia. Game is a form of interactive multimedia content that involves various multimedia elements, such as graphics, animation, sound, video, and user interaction[1][2]. The multimedia content is combined to create a fun and challenging gaming experience for users[3].

As a form of multimedia, games also present challenges in their production. To create a good game, developers must consider various aspects, such as graphic and audio design, gameplay, game mechanics, and user interaction[4][5].

Games also have the potential to incorporate multimedia content in innovative and engaging ways, thereby increasing user engagement and interaction with the content[6][7]. Games can also be used for educational and training purposes, as they enable users to learn new concepts and skills through engaging and engaging interactive experiences[4][8].

Games can be used for learning and training in various fields. Games designed with learning objectives are called game-based learning or serious games. The concept of game-based learning combines fun and interesting game elements with learning objectives to increase student engagement and motivation in learning[9][10].

Game-based learning has several advantages, such as[11][12][13]:

1. Interactive and engaging: Game-based learning offers interactive and engaging learning experiences for students, thereby increasing student motivation and engagement in learning.
2. Provides instant feedback: Game-based learning can provide instant feedback to students, so they can quickly correct mistakes and improve their understanding.
3. Enable independent learning: Game-based learning allows students to learn independently without depending on the presence of a teacher or physical learning facilities.
4. Provides adaptive learning: Game-based learning can be adapted to the needs and abilities of students, so that students can learn more effectively.

Some examples of the use of game-based learning are in learning foreign languages, mathematics, science, history, and skills training such as time management and leadership[14][15].

Game-based learning is a learning concept that uses games as a tool to increase student involvement and motivation in learning. In game-based learning, games designed with learning objectives are called serious games[16][7].

Serious games combine elements of fun and engaging games with learning objectives to create interactive, effective and engaging learning experiences for students. In serious games, students play games that have learning objectives, such as learning new skills, understanding complex concepts, or honing certain skills[17][6].

Serious games can be used in various fields and levels of education, such as learning foreign languages, mathematics, science, history, and skills training such as time management and leadership. Serious games can also be used for professional training and employee development in business and industry[18][5][19].

Some of the advantages of serious games in learning are increasing student involvement and motivation in learning, providing instant feedback, enabling independent learning, and providing adaptive learning. In addition, serious games can also improve skills such as critical thinking skills, collaboration skills, and decision-making skills[20][2][21].

The literature references above provide an overview of how game-based learning is used during the COVID-19 pandemic and its impact on students. Several studies show that game-based learning can increase student motivation and learning performance during the COVID-19 pandemic[22][23].

There are several things that can be done in the current Game-based Learning (GBL) research to continue to develop the use of GBL in the educational context. Here are some things to do[24][25]:

1. Further research on the effect of using GBL on student learning outcomes. Although many studies show that GBL can increase student motivation and learning performance, further research is needed to evaluate the effectiveness of GBL in achieving certain learning goals.
2. Research on effective game design for learning. Effective game design is essential in creating an engaging and effective learning experience. Therefore, it is necessary to carry out further research on game design factors that can influence learning and developing games that are more effective for learning purposes.
3. Research on the integration of GBL with new technologies. As technology develops, there are opportunities to integrate GBL with new technologies such as Virtual Reality (VR) and Augmented Reality (AR) to create more immersive and interactive learning experiences. Therefore, it is necessary to carry out further research on the integration of GBL with new technology and its effect on learning[26].
4. Research on GBL development that can be adapted to individual needs. Every student has a different learning style and needs. Therefore, it is necessary to carry out further research on the development of GBL which can be adapted to the individual needs of students, such as learning abilities, learning styles, interests and preferences.
5. Research on the use of GBL outside the context of formal education. Apart from being used in formal education, GBL can also be used in other contexts such as employee training and professional development. Therefore, it is necessary to carry out further research on the use of GBL outside the context of formal education and its effect on learning and skills development.

METHOD

Bibliometric analysis is a quantitative method for analyzing bibliographic data in articles/journals. This analysis is usually used to investigate references to scientific articles cited in a journal, to map the scientific fields of a journal, and to classify scientific articles according to a research field. This method can be used in the fields of sociology, humanities, communications, marketing, and other social groups. The approach used in bibliometric analysis is a citation analysis approach to see 1 article cited by 1 other article, and a co-citation analysis approach to find 2 or more articles cited by 1 article[24].

In analyzing bibliometric data, we need a software that is used as an analysis tool. One tool that can facilitate the analysis of bibliometric data is the Histcite Software. This software can be used to see impactful authors, find out the graphs of years of research publications, and see institutions that have done a lot of research on a research field[25][27]. With the benefits provided, the data produced by Histcite can be used as a basis for developing research in certain fields of science, especially those that are still little researched. In an academic setting, the data produced by Histcite can also be used as evidence to readers and reviewers that the topics raised in research are important topics to discuss[28].

In this paper the author uses the technique of blibliometric analysis using a platform, namely the VOS Viewer. First of all, the author looks for data using the publish or perish platform to obtain a number of related articles. Articles were taken within the last 3 years, from 2021 to 2023 (currently). The following describes the process of solving gap issues related to game platforms in learning.

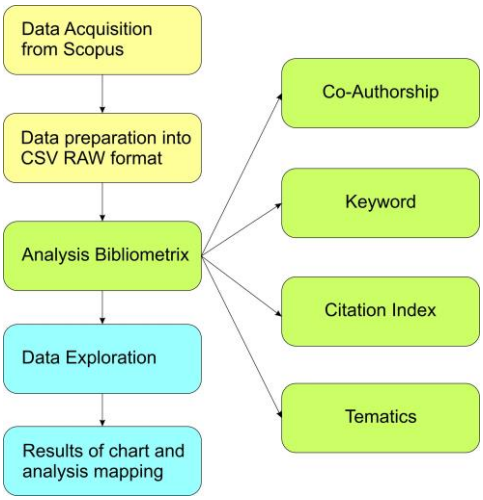

Figure 1, The process of completing the search for gap issues

RESULT & DISCUSSION

The first thing the author does is to find information from several collections of articles taken from Scopus. The results of article data retrieval obtained a number of journal articles totaling 1500 documents with the keywords "Game, Base Learning, Issue". The articles obtained are limited to the last 3 years within the scope of social and computer science.

Table 1, Collection of article data for the last 3 years.

Metadata	Description	Missing Counts	Missing %	Status
AB	Abstract	0	0.00	Excellent
C1	Affiliation	0	0.00	Excellent
AU	Author	0	0.00	Excellent
DI	DOI	0	0.00	Excellent
DT	Document Type	0	0.00	Excellent
SO	Journal	0	0.00	Excellent
LA	Language	0	0.00	Excellent
PY	Publication Year	0	0.00	Excellent
TI	Title	0	0.00	Excellent
TC	Total Citation	0	0.00	Excellent
DE	Keywords	119	7.46	Good
RP	Corresponding Author	212	13.28	Acceptable
ID	Keywords Plus	804	50.38	Critical
CR	Cited References	1596	100.00	Completely missing
NR	Number of Cited References	1596	100.00	Completely missing
WC	Science Categories	1596	100.00	Completely missing

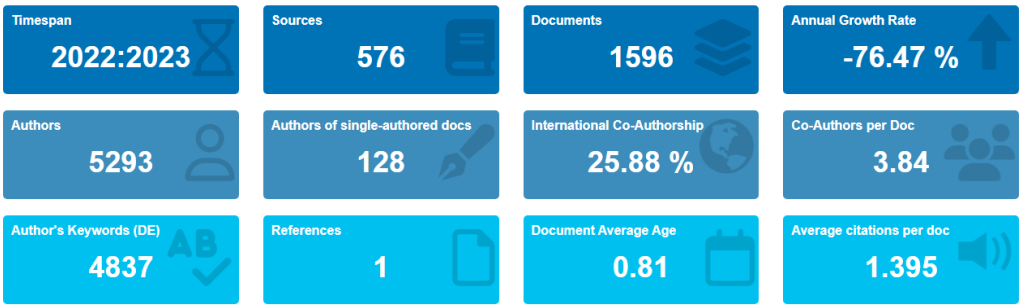

Figure 2, Main information of article data from Scopus

Then the author forms the entire article into RAW CSV form to make it easier to carry out bibliometric analysis using the VOS Viewer. After it was formed, the author then carried out the analysis using the VOS Viewer, assisted by plotting through the R Studio Biblioshiny.

A. The results for the acquisition of the Co-Authorship are as follows:

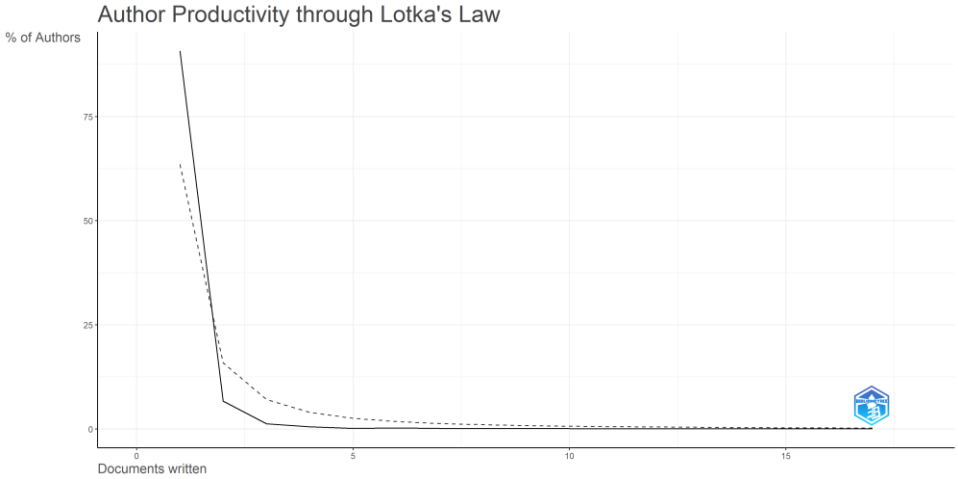

Figure 3, Result plotting Co-Authorship

From the results of the co-author analysis it is known that the level of productivity carried out in research related to this learning game has increased quite a bit. This is read from the resulting graph, namely from 2020 with the capacity for ideas related to issues that are still widely put forward until in 2023 it reaches the point of 0.25%, which means that the discussion has reached the focus point that is actually being studied by researchers.

B. The results for the acquisition of Keyword obtained the following results:
Furthermore, after the writer knows the focus point to be studied, the writer also looks at how high the impact factor is obtained for the keywords that are often used by the writer.

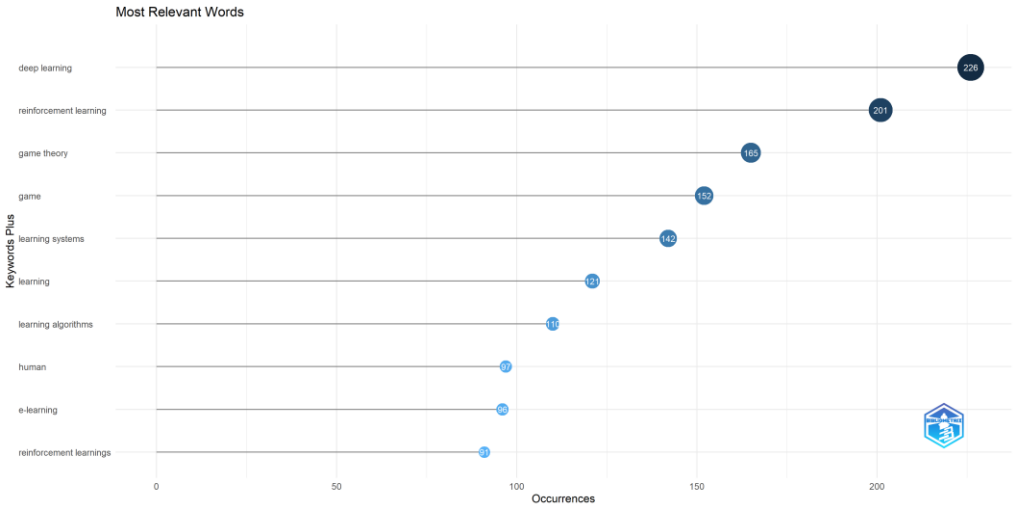

Figure 4, Result plotting Keyword

From the results of the plot analysis it is known that the theme with the keywords "Education and Information Technology" is the main idea of the authors or research that uncovers the theme of games in learning. This means that the role of information technology is very dominant in the theme. Then from relevant words related to information technology, the keyword "Deep Learning" appears, which means that thematically leads to modeling of artificial intelligence. If it is predicted in the theme that will develop, it is likely that the direction of this game will be developed from the AI side for use in learning studies.

C. The results for obtaining the Citation Index are as follows:
After that the author then looks at the citation index. This is necessary to measure how high the level of impact factor is related to the theme and how enthusiastic the writer is in discussing issues related to games in the world of learning. The results of the analysis are obtained as follows:

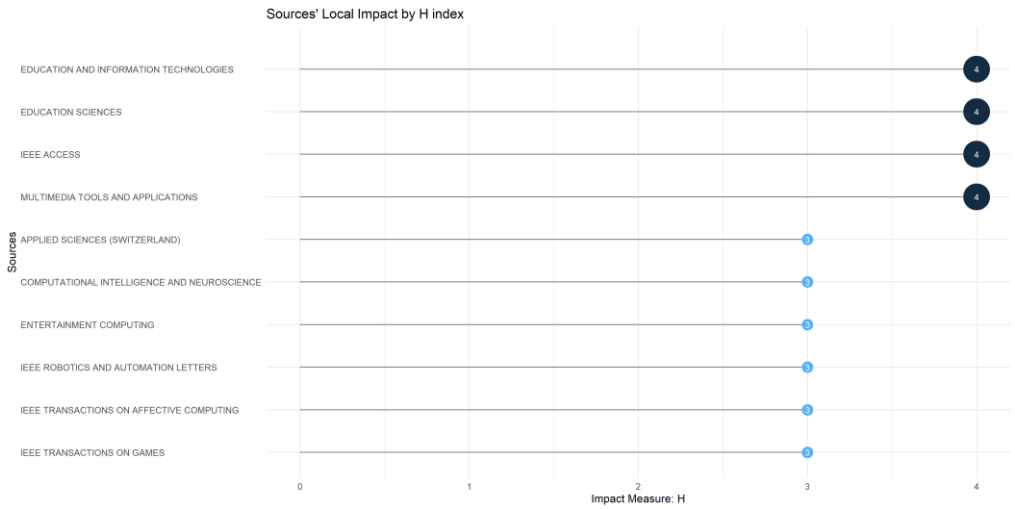

Figure 5, Result plotting Citation Index

D. The results for the acquisition on Thematic obtained the following results:
The last is determining the results of the analysis in terms of topic trends related to games in learning, the results of plotting analysis are obtained as follows:

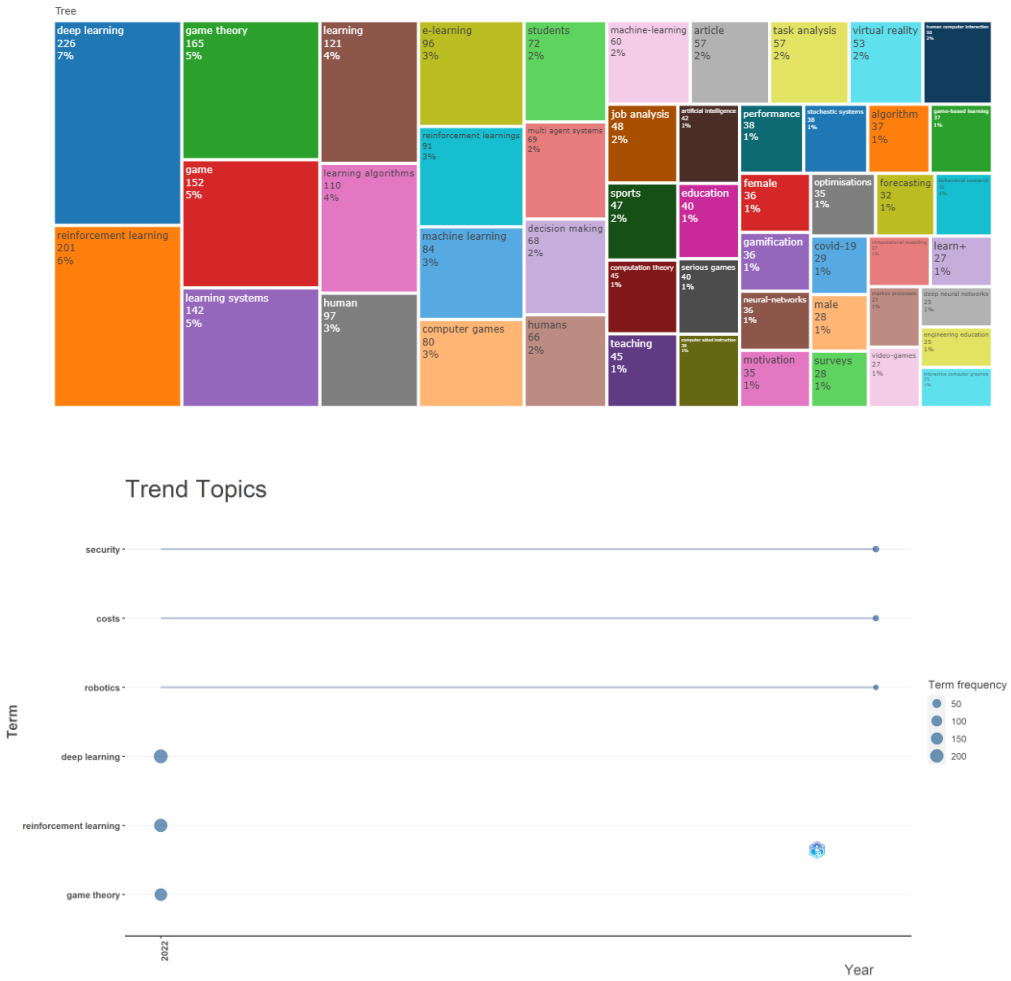

Figure 6, Result plotting Thematic

By looking at the results of the analysis on thematic, it is known that what has become a trend in the last year, namely 2023, is currently related to security. Meanwhile, according to the keywords generated in the previous analysis, the most frequent was "Deep Learning", this is something that is highly correlated with developing information technology.

CONCLUTIONS

From what has been stated in the results of the bibliometric analysis, it can be concluded into several conclusions including conclusions:

1. The emergence of information technology related to learning, games are a unique platform and can be used for media, materials, and methods in 1 package at a time.
2. The selection of gamification in learning is an effective tool that can be developed with artificial intelligence technology.

3. On the other hand, learning gamification platforms are becoming more uncontrollable, therefore for the current theme what is needed is development from a data security perspective.

Finally, the author can conclude in the main formulation that for themes related to game platforms in the world of learning, what is most needed at this time is AI technology for data security issues. This is reinforced by some literature based on keywords that lead to deep learning techniques used by research to develop this theme.

Acknowledgement

The author would like to thank Amikom Purwokerto University and the Telkom Purwokerto Institute of Technology for giving the author the opportunity to continue exploring game themes in this lesson. This is solely to participate in the world of education to be able to help develop in terms of supporting information technology. Era Society 5.0 is very important to discuss educational issues from a technology standpoint, because in fact learning will be returned to the users, not the supporting technology.

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