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Review Article

A Review of Gamification under Various Users, Fields & Applications

Sajithunisa Hussain[1], Remya P George[2] , Nazia Ahmad[3], Rifat Jahan[4] , Nahla Osman Ali Mustafa[5]

[1,2,3,4,5]*Computer, Imam Abdulrahman Bin Faisal University, Applied College, Qatif Dammam, Saudi Arabia*

[1] *Corresponding Author : sajithunisa@iau.edu.sa*

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Abstract *- Gamification denotes a platform from digital games to non-gaming settings. It has emerged in numerous fields and reached various people. This study aims to summarize the systematic literature review on gamification as a motivator and outlines various users, fields, and applications of gamification under study. It describes the distribution of studies as per the sources and years. Therefore, this study completed a systematic literature review of 18 research papers published in various electronic databases between the years 2015 and 2021. This examines the latest developments of gamification in various fields like health and fitness, online learning, Software engineering, learning, teaching, and Virtual reality. Also, it describes a wide range of around 15 applications under gamification and specifies 8 users who benefited from it; among them, gamification has involved many students in increasing their engagement and their motivation. Due to the pandemic outbreak, many students have lost their involvement in their education. Hence this gamification will help them engage and be motivated.*

Keywords *- Gamification in health and fitness, Gamification in online learning, Gamification in software engineering and technology, Gamification in teaching, Learning, and Gamification in virtual reality.*

1. Introduction

Gamification refers ‘to the use of recreation format elements in non-game settings. Gamification may be implemented to encourage and lift the involvement of users with structures. (Jang et al., 2015) [1] Gamification has verified its growth in numerous fields. The author of this paper has decided on five fields. The description is as follows: the first area is for health and fitness, wherein Regular PA reduces the risks of several health issues, including cardiovascular illnesses, type II diabetes, and metabolic syndrome [2] (Steinert et al., 2018). The second is Online learning, which is becoming the conventional method for training university college students. Technology has changed the education structures, which might be nowadays focusing on gaining knowledge through new technological techniques as unfavorable to traditional techniques. (Alabbasi, 2017) [3] .

The third is Software engineering, one of the complex subjects; the route directs to teach the students extremely good practices for developing software program application projects and solutions in every realistic and theoretical aspect. (Ivanova et al., 2019) [4]. The fourth is learning, an activity of the mind that needs a complex method. Some authors described the active advent of ideas through associating received facts with experience. (Enfedaque, 2021) [5]. The fifth is virtual reality which relates to a computer-simulated environment that seeks to reason a feel of being located in a few different locations mentally or physically (Nor et al., 2020) [6]

2. Research Process

Systematic mapping is a study technique that goals to structure, order, and classify study reports and distributions. For our assessment, we followed the process, as indicated with the aid of using Petersen et al. with the accompanying procedures: Defining the research questions, conducting the studies (characterizing the keywords), evaluation of papers, keywording (making use of author watchwords, identify and theoretical), finally results with records extraction and planning (Alla & Nafil, 2019) [7]

2.1. Defining Research Questions

Research approach, A systematic mapping is a study approach that desires to structure, group, and classify research evaluations and publications. We discovered the procedure, in step with Petersen et al., via the following steps: Defining the research questions, undertaking the research (defining the quest keywords), examination of papers, keywording (the usage of keywords, name and abstract), and the final result under statistical extraction and mapping. (Alla & Nafil, 2019) [7]

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Defining studies questions: The most important purpose of scientific mapping research is to offer a top-level view of a study's area and become aware of the amount and kind of studies and effects to be had inside it. (Petersen et al., 2008) [8] The study question goals to cover those elements. It affords a top-level view of studies and articles in which gamification is rising in numerous fields. Our studies questions (RQ) are proven below

RQ 1: What are the diverse domain names and their process covered in this study?
RQ 2: What are the applications used in this gamification study?
RQ 3: Who are the users who benefited from this study?
RQ 4: How are the studies distributed through sources and years (journals/conferences)?

2.2. Organizing Search for Complete Study

This study treated outstanding digital libraries below the ten sectors defined withinside the abstract. SpringerLink, ACM Digital Library, Science Direct, IEEE-Xplore. To search for applicable articles, we described the search string offered withinside the table based on the below sections

Table 1. Search Criteria

Section	Search string
Gamification	Gamify, sports factors, gamified learning
Virtual reality	VR or Virtual reality
Software engineering	SE or Software engineering

2.3. Evaluation of Papers

The purpose of identifying this step is to ensure the selected studies are relevant, associated, and related to the answer to the research questions.

Table 2. Addition and omission criteria

Inclusion	Exclusion
The references are included from 2015-to 2021	Non-English
Full textual content	Uncompleted studies
Study script in English	copied studies

3. Keywording

To attain our cause and solution to the research questions, we carried out an alternative review centered on the fields in which gamification packages are used with apparent artifacts. We met writer keywords and analyzed headings and abstracts. Assessment of the articles allows for discovering the illustrative domains for categorizing current studies, as indicated in Table 3

Table 3. keywording on Current studies

Representative fields
health and fitness
Online learning
Software engineering
Learning and teaching
Virtual reality

4. Results and Discussion

RQ 1: What are the diverse domain names and their process covered in this study?

RQ1 intends to list various domain names of gamification covered in this study. Indeed, as shown in Fig. 1, the maximum of the studies' work was undertaken in health and fitness, and the number of users benefited.

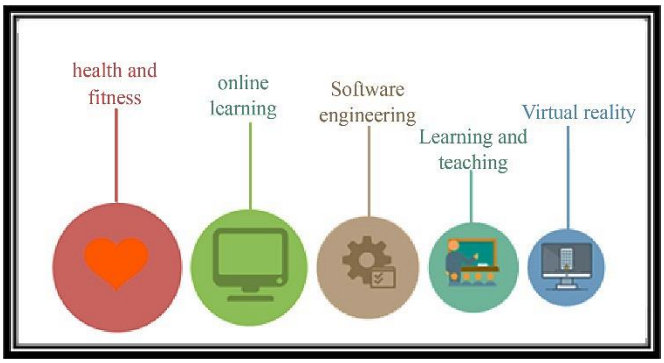

Fig. 1. Various domains in gamification understudy

4.1. Health and Fitness

4.1.1. Fitness Application for Older Adults

The public-funded R&D assignment fMOOC (Fitness MOOC—interaction with older adults with wearable health fitness trackers in a Massive Open Online Course) is geared closer to boosting older adults to boom their physical interest with the assistance of senior-pleasant wearable greater educational gadget composed of a phone training app combined with an interest-monitoring device.

An exciting result is even inside a short education duration of four weeks. Withinside the small pattern of 20 participants, the facts confirmed considerable fitness upgrades concerning the length of each day's bodily interest ($T(19) = -2.274$; $p < 0.05$) and the balancing ability ($T(19) = -3.048$; $p < 0.01$)This can encourage older adults to be greater bodily active. (Ahmad F. Saad, 2020) [9]

4.1.2. Physical Activity in Adults with Autism Spectrum Disorder

Puzzle Walk," a gamified, BCTs-based mobile utility, is powerful in growing consumer engagement and doubtlessly PA in adults with high ASD.

Their primary deployment observes in comparison Puzzle Walk to a famous PA-monitoring utility, Google Fit, to assess the value of each app in growing Physical Assistance in adults with ASD who no longer have an intellectual disability. However, conflicts with each day residing abilities the usage of a randomized managed test design (n = 24). Findings specified that the Puzzle Walk customers consumed appreciably large time quantities on utility use compared to Google Fit customers during a 5-week intervention duration. Even though statistical importance turned into now no longer reached, Puzzle Walk additionally validated the ability to grow MVPA withinside a quick period and lowering inactive time in adults with high-functioning ASD (Lee, 2021) [10]

4.1.3. Gamification for Health and Fitness

A mobile Application for university college students has been developed. In this paper, the author advanced a mobile utility known as "Go Fit" that has blended fitness-applicable features: a calorie tracker to assist a person in losing or keeping weight, blood pressure, a pulse tracker, and a health tracker. These are 3 vital elements to assist a person in staying a wholesome existence and preventing heart disease. In addition, we additionally applied an easy gamification characteristic to boom users' motivation to apply the utility and do the exercises.

Thus, we are hoping that Go Fit may be the answer for folks that are trying to find to keep their weight, get extra suit and maintain their coronary heart wholesome (Buntoro & Kosala, 2019) [11]

4.1.4. Exercise for Overweight Children

Traditional workout [supervised exercise (SE)] intervention is shown to be the only approach to enhancing metabolic fitness. Thus, we propose to increase a singular workout involvement ('S&G workout intervention') that mixes SE intervention with gamification and social incentives layout to growth intervention via WeChat to enhance metabolic fitness and bad activities amongst obese and weight problems children. Participants will adopt tests at baseline, at giving up the intervention period, and within the follow-up time at month 3,6,12. The number one final result is the outcome of metabolic fitness. Secondary results consist of behavioral (e.g., diary bodily activity, diet) and anthropometric measures (e.g., body fats rate and muscle mass). (Fang et al., 2019) [12]

4.1.5. Physical Activity for Older Adults

Older adults are frequently now no longer bodily lively due to the fact they lack motivation, time, and bodily capacity; additionally, the price of healthcare matters. This idea makes 3 important contributions to human-computer interplay: a) improving adaptive involvement recommendations for Physical Assistance (PA) technology for older adults. b) the Exercise Motivation Technology Framework (EMFT) - a context to useful resource withinside the layout and improvement of PA generation for older adults, and c) the Kaleidoscope of Effective Gamification (KEG) - a layout and evaluation device to assist the designer's layout and to increase the gamified apps

The final segment is the professional assessment to check the generation facilitation of PA; the use of the app-Spirit50 additionally points to helpfulness and the pertinence of gamification as a behavior change technology in handing over PA resolutions to older adults. (Kappen, 2015) [13]

4.2. Online Learning

4.2.1. Online Gaining Knowledge of the use of Soft Chalk

Many faculties have applied online gaining knowledge, hoping it's triumph over the demanding situations of face-to-face gaining knowledge of and higher guide today's learners. One problem regarding this is it doesn't provide good enough possibilities for lively involvement and interplay, also with interplay with the material of content, which might be in the middle of any gaining knowledge skill. Therefore, it frequently breaks to involve students.

To offer students attractive and significant online gaining knowledge of experiences, we added the idea of gamification to online gaining knowledge along with a cloud-based device called a Soft Chalk (http://softchalk.com/about). A survey with oral pathology students confirmed that 91% of respondents agreed or strongly agreed that this interactive technique is a powerful one to know and that the case-based layout helped them observe the pathology content material within the clinic. (Zheng & Ferreira, 2020) [14]

4.2.2. Gamification of Online Learning

This study tries to discover matters specific, the consequences of gamification on getting to know and regulating consequences of personality traits. The consequences display that gamification factors contribute to better getting to know results even personality traits, agreeableness, and pre-education motivation are crucial moderators of hyperlinks among the gamification factors and getting to know the results. Our gamified machine turned into designed for university college students to discover ways to practice the Adobe Photoshop software program. The machine consisted of a couple of sessions, and everyone turned into a target to get to know one unique tool. Every consultation in flip includes a sequence of segments.

Every phase turned separated into two components: an instructional and a quiz. 114 volunteers (74 male and 40 female) aided as the experimental members. They were either undergraduate or graduate college students who willingly participated withinside the test. Also, a pre-check

survey of personality traits, including huge 5 personality traits, pre-education motivation, Photoshop experience, and demographic factors, was carried out even as a post-check survey for person engagement, Photoshop self-efficacy, and satisfaction gathered. We set unique education situations with one control group, Control Group, Gamification Group, and Gamification with Time Pressure (GTP) Group. Elements have been used to enhance the general effectiveness of a web getting to know the machine. The results additionally display that relying on user characteristics and unique sports factors can modify learning outcomes. (Gangsar Ali Daroni et al., 2018) [15]

4.2.3. Teacher's Attitude toward the Direction of a Gamification Approach

The reason for this observation was to discover instructors' views closer to using gamification strategies in online getting to know. The study used an exploratory research layout. It collected statistics from forty-seven (47) in-carrier and pre-carrier teachers who have been involved in a graduate instructional technology program. A three-segment survey guided by a 5-factor Likert scale was used to accumulate information.

The online guides have been hosted in a getting-to-know control machine that helps gamification (Talent LMS). Each group was requested to layout the web route primarily based on unique guidelines and manage the course by tracking students' development in assignments and the discussion board. Teachers have been requested to create at least 3 modules of gradual issues observed via way of means of slow issue assignments. The time allotted for students to finish the course was 4 weeks

Survey and Outcomes

The survey had 3 sections, inclusive of 1) positive effects of incorporating sports factors (points, badges, and leaderboards) in getting to know control systems (12 items). 2) Positive consequences of online route layout capabilities in guides that hire sports factors (five items). 3) Negative consequences of incorporating sports factors (points, badges, and leaderboards) in getting to know control systems (five items). The study's outcomes have proven that instructors have an effective notion of incorporating gamification into online getting-to-know. Specifically, the studies have found that instructors understand sports factors as enhancing students' motivation in the direction of the course goals. Teachers consider that incorporating sports factors gives college students a degree of autonomy, giving them the sensation of being on top of things in their getting to know the process. It is, therefore, clear that gamification is a notably conventional approach that improves the overall performance of students.

According to instructors, the usage of online guides designed with improved issues increases the college student's degree of competence, allows them to have amusement and leisure even getting to know and turn out to be greater engaged in path discussions (S. Krishnaprabu, 2019) [16]

4.2.4. Sustainable Online Learning Probable with Gamification

This study examines the impact that gamified online getting to know students has applied a gamified online getting to know software to observe the effect. An observation was performed with 140 elementary and middle school students to decide the software's efficacy. The observer's findings recommend that gamification in online getting-to-know has a high-quality effect on learner motivation and knowledge of the academic content material.

Science Level Up, an internet getting-to-know platform, saw the standards and was provided free of charge through public establishments in the region of South Korea. Science Level Up gives gamified getting-to-know packages in science training for elementary, middle, and high school students. Participants who play the corona undertaking attempt to escape the coronavirus by transferring their imaginary characters.

Science Level Up gives numerous missions, which consist of gamified getting-to-know packages, simulation games, and educational videos. Learners pick the content material they need to research and earn an SQ after efficiently completing the application.

Survey and outcomes: To a degree, the academic effectiveness of the gamified technological know-how getting to know the platform, a category, and the usage of Science Level Up was carried out for 8 weeks with South Korean primary and middle school students. The questionnaire was carried out after the finishing touch of the course program, and the students who participated in the class were asked to complete the post-survey. The science motivation questionnaire II (SMQ-II) developed by Glynn et al. [15] was used to assess the learner's motivation. The outcomes suggest that gamified online getting-to-know packages have a high-quality effect on the motivation, self-efficacy, self-determination, professional motivation, and grade motivation of learners, even as additionally facilitating their understanding of educational content. [17] (Mochammad Haldi Widianto, 2021)

4.3. Software Engineering and Technology

4.3.1. Gamification Test in IT Engineering

Higher training in Spain has to cope with regular issues and uncertainties because of the monetary crisis, excessive quotes of unemployment in younger people, lack of observed conduct in secondary school, and legal fluctuations. However, the modifications got here from the upper (governments) to the lowest (lecturers and students) so that

they had been now no longer well supported through specialized education orientated to lecturers. Those methodologies attempt to hold the scholars engaged throughout the complete direction, paying extra attention to their getting to know the system, attitudes, motivations, and expectations. The test is primarily based on gamification's utility to the evaluation system emulating a conventional platform video game, like Super Mario.

The results of this gamification test withinside the evaluation assessment were measured using 3 parameters for each theme:

- Disengagement: percent of duties that had been now no longer passed in amongst all evaluated duties.
- Effectiveness: percent of exceeded duties amongst all of the evaluated duties.
- Performance: suggest marks of all evaluated duties from zero to 10.

On the complete, from the private remarks from the scholars and their conduct throughout the semester, we also can conclude that the utility of gamification became high-quality in the standard for getting to know the system of all of the college students who participated and did now no longer think any interference in the assessment system. [18] (Sumitra Nuanmeesri et al., 2022)

4.3.2. Engaging in Software Program Engineering Courses

Educating Software Engineering, however, is pretty challenging because the difficulty isn't always considered maximum thrilling through students, even as instructors regularly must cope with exploding a wide variety of students. The EU project IMPRESS seeks to discover gamification usage in teaching software program engineering on the college stage to enhance students' engagement and gratitude for the taught subjects. This study affords the mission, objectives, and modern growth.

IMPRESS seeks to supply improvements that might assist in enhancing students' engagement and exuberance on subjects historically taken into consideration as uninteresting. Its attention to the following • Improving in-class engagement via gamified quizzes. • Educating out-class engagement via educational video games that may be performed at domestic or in unguided lab sessions. • Enhancing gamification with storytelling AI. IMPRESS has contributed improvements in gamification, and extra may be predicted earlier than the mission results in 2020. Ultimately though, energizing Software Engineering training isn't always an undertaking that a single task like IMPRESS can clear up on its own. [19] (Schmitt et al., 2019)

4.3.3. Gamification in Software Program Engineering

The paper outlines the outcomes primarily based on using gamification in tutoring to structure and stimulate the student's motivation and engagement in class. Different types of software program engineering games remain tested, and numerous of the maximum suitable and applicable to the student's discipline of study remain included in the Software engineering course. An appropriate variety of student sets were chosen, and the survey outcomes held among the college students were shown.

The following games have been tested, The Millionaire games, Kahoot recreation, Alphabet brainstorming, code combat game, planning poker game, Kanban & scrum team role-playing game. In 2018 a survey was given to the students of full-time and part-time opinions on the software program engineering direction. The survey changes into achieved with the aid of using seventy-eight students who completed the course. The final result revealed that the most motivating game for the students was the Brainstorming game, which led to 65.5 % of the participants elected for it (Jigar K Patel, 2021) [20]

4.4. Teaching and Learning

4.4.1. Teaching Software Engineering with Students

The pupils of the software program engineering track in training regularly enjoy a loss of enthusiasm, partly because of conventional coaching strategies. In our look at the application, we added a unique mixed mastering idea with threefold gamification factors in coaching software program engineering. In this study, we deliver the coaching technique blend with precise recognition of mixing 3 gamification factors to increase college students' involvement.

Threefold Gamification

To foster the enthusiasm of college students even extra, we added 3 gamification ideas in our lecture: an assignment, level-based development monitoring, and experiential mastering via personal recreation initiatives. The assignment is prepared as a type of competition among the improvement teams, wherein they compete for common resources, which can be factors for the grading in our lecture. The second gamification idea is primarily based totally on expertise stages in keeping with Bloom's Taxonomy. For our direction, we tailored the six authentic classes into 4 tiers. (create/Analyze and evaluate, Apply, Remember and understand). In experiential mastering, in our direction, college students are imagined to examine with the aid of experiencing all levels of an ordinary industry-like software program task. Therefore, college students will probably discover themselves with their initiatives resulting in improved motivation. [21] (Schefer-Wenzl & Miladinovic, 2018)

4.4.2. Teaching Java for Students

This study's goal is to present an outline of gamification in mastering settings that can assist students in trying to master Java programming—being privy to the weaknesses of programming language, specifically Java, through the usage of gaming as an amusing pastime. This paper is built with a

qualitative evaluation of files, journals, books, and the like. The outcome showed that gamification might be carried out to inspire newcomers to enhance their programming abilities because gamification in schooling makes freshmen extra amusing and enables knowledge of the coursework.

GeNIE consists of Points, Leaderboards, Badges, and Achievements as its gamification detail subset. Switches aren't the simplest given to instructors; they are also given to students who can manage their settings. Students are given the alternative to permit or disable character factors of gamification for a given course in a selected semester, which would possibly, in the flip boom, their feeling of autonomy and competence by now no longer forcing anything on the students.

Self-Determination Theory (SDT) characterizes the hyperlink between inward and outward suggestions. It indicates three crucial additives: The need for skill, the requirement for relatedness, and the requirement for independence. The unfolding of the digital generation makes gamification extra sensible to the brand-new era of virtual natives familiar with the exercise of games. This paper allows beginner students to analyze java programming through gaming to deliver the amusement and pleasure of their mastering. [22] (Maiga, 2019)

4.4.3. Gamification in Teaching Project Management

The EVA game is a connected board game that additionally includes game factors such as rewards, leaderboards, badges, points, tiers, and remarks. These game factors intend to arouse opposition amongst students, growth motivation, and degree of engagement and make the learning process extra interesting. it established that scholars undoubtedly assessed the creation of gamification factors into the study procedure. The game's intention turned into supplying a software program task to the client with time and budget. At the time of the experiment, the board game turned into utilized the task control publications of the undergraduate study application at the Federal University of Santa Catarina to enhance motivation, personal enjoyment, and the game's role. Overall, 28 students, which performed the game, participated in the survey, and the general remarks from the bulk of students turned out effective.

Type of Tasks

The EVA game has carried out four kinds of responsibilities: definition, formula, percentage, and picture responsibilities.

The first kind of project is the definition identity project in which the participant has to discover EVA metrics out of given alternatives; the second kind of project is the EVA metrics calculation project in which the participant has to calculate unique EVA metrics through plugging in the system of measurement from the task. The third kind of project is the problem-fixing project. The project is primarily based on the work assignment presently in execution. The final kind of project is a graph interpretation project that is, in essence, a problematic-fixing project.

Implementation and Effectiveness

The EVA game evolved the usage of internet technology for simpler get entry to and aid. The gamified device turned into evolved the usage of React for front-side improvement, and the backside carried out the usage of Express, a Node.js internet software framework. Open supply DBMS, my SQL used to give the systems a relational database.

The questionnaire outcomes confirmed that enthusiasm and game enjoyment had been valued above average. Maximum students spoke back that they handled extra readily after game playing, which aided them in preparing well for their midterm exam. Based on questionnaire outcomes, 40% of students paid 3 hours in the EVA game, and the remaining (60%) spent one hour.

Project control problem encompasses several task execution and management strategies used to ensure a hit task delivery. (Magylait et al., n.d.) [23]

4.5. Virtual Reality

4.5.1. Sports

To discover the primary findings from studies on gamified virtual reality in sports. The conclusions of consumer enjoyment show that gamification additives enhance the satisfaction of the consumer in the course of the bodily pastime and offer a set of guidelines to inspire the athlete or consumer to carry out higher.

A VR primarily-based education and involvement scheme has a few benefits, including the capacity of athletes to train despite climate situations and the capacity of people to sense the actual circumstance of the environment. This study studied the use of gamification techniques to assist bodily workouts in immersive VR placement. Through the effects of consumer enjoyment, it can show that gamification additives are boosting the satisfaction of the consumer in the course of the physical interest and offer a fixed of policies to inspire the athlete or consumer to carry out higher. [24] (Nor et al., 2020)

4.5.2. Pediatric Patients Undergoing Anesthesia

The usage of gamification in healthcare has gained popularity. This prospective, randomized medical trial turned designed to assess whether or not gamification of the preoperative procedure—thru virtual reality gaming that offers a vivid, immersive and practical reveal—may want to lessen preoperative tension in kids.

Children in the control group obtained traditional training concerning the preoperative procedure, while the ones in the gamification group performed a five min VR

game feeling the preoperative enjoyment. Preoperative tension, induction compliance checklist (ICC), and procedural conduct score scale (PBRS) have been measured. The present-day study assessed the consequences of gamification—through VR gaming—on preoperative tension. The outcome confirmed that undergoing the preoperative procedure through VR games can also additionally successfully lessen tension in pediatric patients (approximately 40%). The end outcome of the present-day study can be defined through the mixed impact of gamification (motivation and engagement) and VR enjoyment (immersion and fact.

Through VR game usage, gamification at the enjoyment of the perioperative procedure seems to lessen preoperative tension and enhance compliance at some point of anesthetic induction in kids undergoing non-obligatory surgical treatment and standard anesthesia. [25] (Ryu et al., 2018)

4.5.3. Working out for Motor Imagery Brain-Computer Interfaces

This study offers gamified motor imagery brain-computing interface (MI-BCI) education in immersive VR. The planned education approach intends to boom engagement, attention, and motivation in co-adaptive event-pushed MI-BCI education.

It was accomplished through the usage of gamification, the modern boom of the education pace, and the digital fact layout reinforcing embodiment into the avatar. Of the 20 wholesome individuals appearing in 6 runs of 2-elegance MI-BCI education (left/right hand), 19 have been educated for a primary stage of MI-BCI operation, with common top exactness in the consultation = 75.84%.

Fig. 2 Applications used in gamification under study

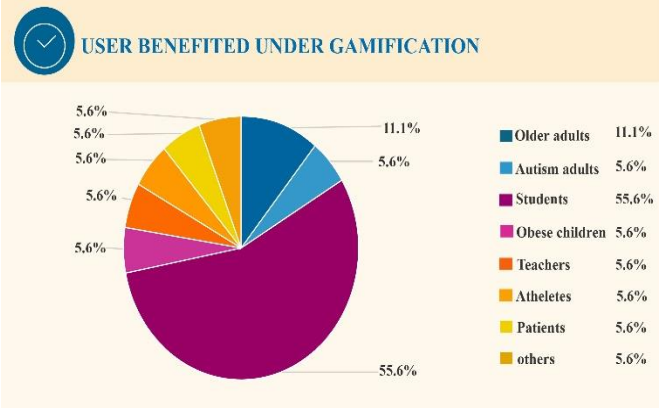

Fig. 3 Users benefited chart

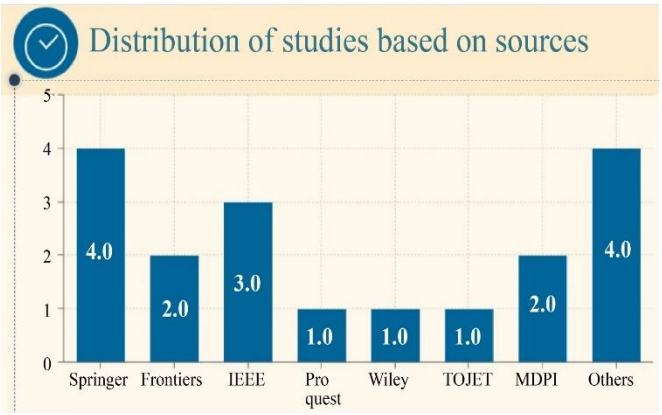

Fig. 4 Distribution of sources

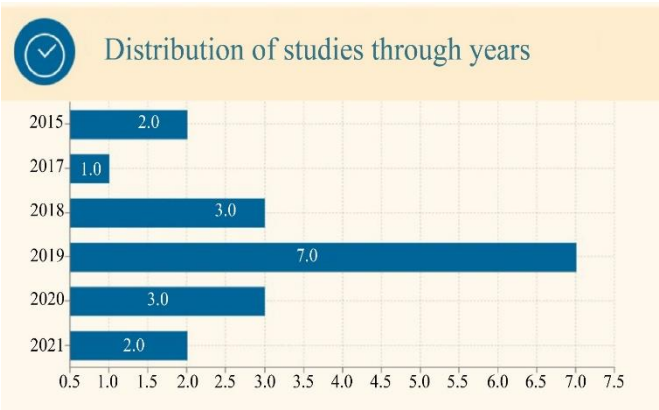

Fig. 5 Distribution of years

This confirms the planned education approach flourished in developing the MI-BCI abilities; moreover, members have been parting the consultation in the excessively advantageous move.

Although the overall performance wasn't at once connected to the diploma of embodiment, the subjective significance of the body rights transmission is linked with the capacity to modify the sensorimotor rhythm.

EEG information has been recorded using a wi-fi light-weight EEG device Neuroelectric Enobio 32 1, with 28 electrodes targeted across the motor cortex. Electrodes (AgCl NG Geltrode) have been located using a neoprene cap, following the usual 10–10 devices for high-resolution EEG recording. Common mode sense/pushed proper leg (CMS/DRL) ear clip served as a reference for the signals. The Touch controllers supplied vibrotactile remarks and observed members' hand movements. Members did not actively interact with the controllers; they aided simplest as an aid for the palms during the training runs. [26] (Škola et al., 2019)

RQ2: What are the applications used in this gamification study?

To solve this question, we considered the packages covered in this study under gamification. The intention is to list the outline for each software and its benefits. It is defined in Fig 2.

RQ3: Who are the users who benefited from this study?

To answer this question RQ3, we considered the users who benefited from the gamified platform. The aim is to list various users that profited from gamified applications. Indeed, as confirmed below in Fig 3, the students benefited more, with 55.6 % of publications.

RQ4: How are the studies distributed through sources and years (journals/conferences)?

To answer this question RQ4, many online databases were used to cover a broad range of academic publications. The online database used were: Springer, Frontiers, IEEE, Pro quest, Wiley, TOJET, MDPI, and others. These databases are considered related and deliver high-impact factor publication, as shown in Fig 4.

The years nominated for the review are from the year (2015–to 2021)—the delivery of the studies through the years. As shown in the graph, the publications of gamification studies have gradually increased from 2018 and then rose highly in 2019, recording 7 studies, as shown in Fig 5.

5. Conclusion

In this study, a systematic review method is done to observe many journals and conferences on gamification usage in various fields and applications, and several users benefited from the understudy. We did a deep study with good results. With an overall of 30 related papers,18 papers were taken into consideration. The maximum number of papers were published over the last 4 years. We found that the most related areas were health and fitness and online learning, which served users more under gamification.

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