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Journal of Behavioral Informatics
Digital Humanities & Development Research
Vol 9, No 1, 2023 Series

Towards an Evaluation of Factors Affecting the Utilization of Games-Based Instructional Interventions for Learning Among Students in Nigerian Higher Educational Institutions (HEIs) – A Research Agenda

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ABSTRACT

Recent studies have demonstrated the capacity of technology to enhance outcomes in education. Technology-enhanced learning environments can assist students track their learning behaviour, encourage self-paced learning, knowledge retention and self-discovery of knowledge. One technology tool at the forefront of educational experience enhancement is Games. With the motivational potential of games, institutions are beginning to deliver pedagogical interventions in Games format. The term "gamification" or "Gamified Information Systems" describes technological solutions that aim to increase student engagement, combat poor motivation, and use game design features. This paper reports a research agenda to evaluate factors affecting the utilization of games-based instructional interventions for learning among students in Nigerian Higher Educational Institutions (HEIs). We present the research objectives, research questions and research directions.

Keywords: Games-Based Instructional Interventions, Learning, Students, Nigerian Higher Educational Institutions (HEIs)

Journal Reference Format:
Longe. E.O. & Jimoh R.G (2023): Towards an Evaluation of Factors Affecting the Utilization of Games-Based Instructional Interventions for Learning Among Students in Nigerian Higher Educational Institutions (HEIs) – A Research Agenda. Journal of Behavioural Informatics, Digital Humanities and Development Research. Vol. 9. No. 1, Pp 61-80. Available online at https://www.isteams.net/behavioralinformaticsjournal. dx.doi.org/10.22624/AIMS/BHI/V9N4P5

1. INTRODUCTION

According to Deterding, Dixon, Khaled, and Nacke (2011), the term "gamification" began to acquire traction in scholarly discussions in the 2010s, after being first used by Nick Pelling in 2002 to describe digital and online environments. "Game design" or "game thinking" to accomplish goals beyond mere entertainment was often emphasised by researchers and

practitioners as they developed the concept of gamification (Liu, Santhanam & Webster, 2017; Zichermann & Cunningham, 2011). Deterding et al. (2011) defines gamification as the use of game design principles in non-game contexts; this is the most widely used definition in the field of human-computer interaction. This is how gamification is defined differently from serious games, which are full-fledged games made to achieve certain real-world goals. Game elements are defined by Deterding et al. (2011) as aspects that are typically seen in games, play a significant role in the gameplay, and are necessary for an engaging gaming experience.

Gamified information systems (GIS) are defined as game elements that integrate utilitarian value, such as productivity, with hedonic value, including fun and excitement (Koivisto & Hamari, 2019). These systems are included in a service package that provides a structured approach to gamification (Huotari & Hamari, 2012). The use of game mechanics to achieve organisational goals by inspiring stakeholders, (whether internal and external users) to overcome obstacles and encourage positive learning behaviours is known as gamification in education (Deterding et al., 2011).

1.1 Some Definitions of Gamification

Table 1.1: Gamification as defined by authors

Author(s)	Conceptualization
Huotari & Hamari (2012)	"A form of service packaging where a core service is enhanced by a rules-based service system that provides feedback and interaction mechanisms to the user to facilitate and support the users' overall value creation".
Deterding *et al.* (2011)	"The use of game design elements in non-game contexts (p.5)."
Werbach & Hunter (2012)	The application of game features and design principles in cont exts outside of traditional gaming.
Werbach (2014)	The technique for producing things more like games.
Fitz-Walter (2015)	"A design strategy where game elements are used in non-game applications to promote behaviour change and enhance the hedonistic qualities of the userexperience".
Zichermann & Cunningham (2011)	The way to utilise game mechanics and game thought to captivate users and resolve issues.

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1.1.1 HEIs and Gamification

Recently, many organisations and institutions of higher learning (HEIs) have integrated gaming techniques and game components in order to enhance participation (Gartner, 2011; Parra-González et al., 2021). Despite the increasing interest in gamification, there is a lack of robust academic evidence supporting its effectiveness, as much of the existing literature is anecdotal (Yang, Asaad & Dwivedi, 2017). Research on gamification, due to its relatively recent emergence, has rarely examined its conceptual framework or offered definitive conclusions about its potential and effectiveness (Sailer et al., 2017).

There is some uncertainty on how institutions measure the success of gamification, particularly when considering the various contexts and goals it is designed to achieve. It has been suggested by Subhash and Cudney (2018) that gamification at universities is often held to unrealistically high standards of success. This leads many schools to jump to conclusions about whether gamification is the best approach for their students and teachers before putting it into practice (Burke, 2013). Meanwhile, existing research shows that most games in Nigeria have only been used in elementary and secondary schools, with very little effort put into using them at the higher education level. Table one shows related works tabulated to highlight relevant literature, research gaps, contributions and implications to the current study

2. SYSTEMATIC LITERATURE REVIEW

Table 1.2: Highlights of Relevant Literature

S/N	Authors	Contributions	Research Gaps	Implications to the current study
1	Ajetomobi (2019)	In his 2019 study, Ajetunmobi analyses how Yoruba language proficiency is affected by gaming methods among junior high school pupils. A non-equivalent control group was used in the study, and the research followed a quasi-experimental approach. In Abeokuta, Ogun State, Nigeria, 145 junior secondary school students from 5 schools across 2 LGAs were polled.	Purely empirical, no model was developed. The work is not theory driven and only applicable to Secondary Schools	Our work will develop a model and will be theory driven
2	Olufemi (2021)	Olufemi (2018) detailed an investigation into the present system of learning, with a primary emphasis on junior secondary schools, as part of his discussion of how game-based learning systems may benefit schools in Nigeria. As a demonstration of how games may be utilised to improve learning, the study revolved around the creation of an activity that assists students to learn geography.	It was not implemented and it is not theory driven and only applicable to Junior Secondary Schools	Our work is targeted at HEIs and theory driven

3	Ayotola (2022)	Ayotola (2022) examined how elementary school students' performance on fractions-related assessments changed after playing digital math games	This work also looks at how games can help students learn in secondary schools.	Our work is targeted at HEIs and theory driven
4	Dele-Ajayi, Strachan, Pickard and Sanderson's (2019)	Dele-Ajayi et al. (2019) developed the online game SpeedyRocket to teach students about estimation as an augmentation to the mathematics curriculum in three schools situated in rural Ado-Ekiti, Nigeria.	A Game was developed. There is no theory component to access acceptance and usability.	Our work is targeted at HEIs and theory driven
5	Sunday, Okenyi, Ezema & Amoke (2020)	In light of the increasing demand for digital technologies to permeate educational practices, Sunday and his colleagues examined how digital game-based learning impact students' performance in scientific classes.	This work is also empirical and lacks theoretical antecedents	Our work is targeted at HEIs and theory driven
6	Agbo, Oyelere, Suhonen & Laine (2021)	In their article titled "Co-design of Mini Games for Learning Computational Thinking," Agbo et al. (2021) detailed the process of creating these games together with the purpose of educating students about computational thinking (CT) fundamentals and ideas in a digital setting. Among Nigerian students majoring in computer science.	This is one work that was targeted at the HEIs. However, it is descriptive, not theory driven and no evaluation of the impact of the development was mentioned.	Our work is theory driven
7	Mulchandani , Alslaity and Orji (2022).	In particular, studies aimed at encouraging and engaging learning practices were criticised for highlighting the limitations and unforeseen effects of gamification.	Research on the effects of gamified learning environments was flawed since it treated users as a homogeneous population.	Our work will consider Users as heterogeneous entities and factor in their various antecedents using appropriate theories
8	Dellos (2015).	Developed a digital game for learning and implemented same	The work is design and implementation and no feedbacks on usage. Not theory driven	Our work is targeted at HEIs and theory driven and will provide a feedback loop min the model design
9	Aldemir, Celik, and Kaplan (2018)	Students' points of view were taken into account when analysing the game's components, such as boards, feedbacks, etc.	The work is not targeted at HEIs. It is also not theory driven and does not inform policy	Our work is targeted at HEIs and theory driven

10	Deterding (2011)	Affordance was investigated and modelled in this paper.	Design elements were not considered nor is the work African focused	Our work is will consider design elements, targeted at HEIs and theory driven
11	Deterding (2015)	Methods for game designs were evaluated and presented in this work.	User Skills were advocated as being important to game design in this paper. Other design elements were not considered	The research will consider other elements in our work
12	Fitz-Walter. (2015)	The research investigated user experience, motivation for adoption and behavioural change.	This work is not African focused and concentrates on user experience.	Our work is African focused
13	Göksün and Gürsoy (2019)	The work evaluates successes in eLearning experiences using games from a Western perspective	Western focused	Our work is African focused
14	The 2014 study of Hamari, Koivisto and Sarsa	A systemsic literature survey on the fea sibility of games is presented in this arti cle.	The focus is also on the western world and nothing is mentioned about Africa	Our work is African focused
15	Lai, Hsiao and Hsieh (2018).	The flipped classroom in this work is said to be able to inculcate Games.	Little is said about game designs and the teachers understanding of their use and contributions to their development	Our work will address game designs using theoretical lens
16	Liu Santhanam, and Webster (2017)	Presented here are game information systems as well as a structure for game creation and study.	The work lacks any bias towards Africa and does not address the work from a theoretical perspective	Our work is African focused
17	Mustafa, Alkawsi, Ofosu-Ampong, Vanduhe, Garcia and Baashar (2022)	Online game-based education in Africa was the primary emphasis of the study.	The work did not address issues relating to Games in Conventional instructional usage.	The current research focused on both online and more traditional classroom settings.

18	Parra-González, López-Belmonte, Segura-Robles and Moreno-Guerrero (2021)	The flipped classroom in this work is said to be able to inculcate Games.	Little is said about game designs and the teachers understanding of their use and contributions to their development	The research will address game designs in our work
19	Rigby and Ryan (2011)	This work focused on video Games	The incorporation of instructional games into the curriculum was not covered in the study.	The research focus on the use of games for instructional purposes
20	Sailer, Hense, Mayr and Mandl (2017)	Motivating outcomes of games were discussed as well as how it satisfies the psychological needs of users	The focus here is not on instructional purposes	The research focus on the use of games for instructional purposes
21	Sailer and Sailer (2021)	The flipped classroom in this work is said to be able to inculcate Games.	Little is said about game designs and the teachers understanding of their use and contributions to their development	Teachers' and students' points of view were considered in the evaluation.
22	Subhash and Cudney (2018)	Gamified learning in higher education institutions is the subject of an in-depth literature review.	Design issues as well as perspectives from the African environment is not given	Our work will address game designs using theoretical lens and will be African Focused
23	van Roy and Zaman (2017)	Reasons for the failure of gamification and how these can be addressed are discussed in this paper.	Gamification heuristics and self-determination theory was adjudged as able to address issues raised. The Work is westernized.	The research will explore other related theories
24	Yamani (2021)	It was suggested a theoretical framework for incorporating games into online education.	The design was not carried or modelled.	The research will model gamification
25	Zichermann and Cunningham (2011)	The work focused on game implementation on the web.	Instructional issues were no addressed.	Our work will address game designs using theoretical lens and instructional issues.

2.1 Summary of Research Gaps

Based on what the research knows from reviewing the research, gamification systems still have a way to go before they are widely used and accepted. This is in part because there aren't enough detailed rules, and there's a bias towards using a cookie-cutter approach, which makes things more difficult to implement in underdeveloped nations. The results of gamified information systems (GIS) are inconsistent, with some implementations falling short of their goals despite the fact that they seek to engage and encourage students. Results from GIS evaluations on users' intentions to continue using these systems are inconsistent, especially within specific demographics. This thesis is primarily concerned with the question of how to modify gamification such that it meets the needs of individual students in an effort to boost interest, drive, and the adoption of more desirable habits.

Apart from the educational landscape, games have been deployed in Nigeria among children to boost nutrition, (https://theconversation.com/games-boost-student-nutrition-in-nigerian-schools-94025), There are also a number of organizations that now focuses on developing Games for schools such as School Games Limited and gamesindustry.biz. The lack of research on the implementation, acceptance, dissemination, and utilisation of games at the tertiary level makes it clear that these tools are not widely used in this setting.

3. RESEARCH DIRECTION

3.1 Research Problem

Higher education institutions in poor economies face unique problems when it comes to designing and implementing gamification. The limited research in Africa, especially in Nigeria, regarding the impact of gamification on instructional effectiveness is a significant concern. This underscores the necessity for interventions based on behaviour change theories, as suggested by researchers (Michie et al., 2008; Siponen & Baskerville, 2018). Evaluating interventions should adhere to a structured methodology, commencing with a theoretical phase, progressing to modelling, and concluding with an exploratory trial (Campbell et al., 2007; Al-Mamary et al., 2019).

In order to create and assess gamified interventions that can overcome these obstacles, the study put forward a theory-driven approach. This theory-based strategy for behaviour change has the potential to increase the efficacy of interventions by grounding them in a well-defined set of underlying causes. Using behavioural theories as a framework, this research looked at how gamification may motivate and engage students at Nigerian universities to learn more actively.

3.2 Aim and Objectives

This research aimed to conduct a Theory-Based Evaluation of the factors influencing the utilisation of gamified instructional interventions to enhance learning among students in Nigerian higher educational institutions.

The following specific objectives were pursued to achieve this aim:

1. Investigate the level of awareness among teaching faculties on the use of gamification for instructional purposes
2. Determine to what extent gamification has been deployed or used in existing Higher Educational Instructional strategies in Nigeria
3. Based on (1) and (2) develop and test a model that integrates gamification in instructional strategies for enhanced learning in Nigerian higher education institutions

3.3 Theoretical Perspectives and Hypothesis Developments

Theoretical concerns have led gamification researchers to embrace different frameworks that examine how gamification might restructure task activities (de la Peña Esteban, Torralbo, Casas., & García, 2020). There are a lot of obstacles to overcome while creating, testing, and assessing gamification treatments. This is especially true in underdeveloped countries where academics have failed to adequately characterise, identify, design, and assess the complex gamified interventions in higher education with regard to uptake, engagement, and utilisation. Therefore, there is a lack of a unified theoretical framework in the field of gamification that may be used to develop gamified interventions for use in academic settings.

The Self-Determination Theory (SDT)

To better understand what drives people to play video games, Deci and Ryan (1985) put forth a well-known hypothesis that differentiates between two types of motivation: intrinsic and extrinsic. Individuals, according to Self-Determination Theory, have innate tendencies towards psychological growth, which is defined by a coherent self and responsible, autonomous action.

Recent research by van Roy and Zaman (2019) shows that gamification can be effectively used to investigate the possibilities of self-determination theory (SDT) in educational settings. The connection between game mechanics, player happiness, intrinsic drive, and gamification results was not investigated in the aforementioned study by van Roy and Zaman. Additionally, the researchers did a good job of documenting the ambiguous motivating impacts of gamification; nevertheless, they failed to address the intermediary function of meeting psychological demands among game design components and learning outcomes. Using SDT as an example, van Roy and Zaman (2019) found that its tenability is inadequate and restricted. Hence, further studies are needed to validate the relevance of Self-Determination Theory in tailoring gamification for educational settings.

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Digital Humanities & Development Research
Vol 9, No 1, 2023 Series

Unified Theory of Acceptance and Use of Technology

The UTAUT was first proposed by Venkatesh et al. (2003) and is based on a comprehensive literature study that synthesises previous studies on technology adoption. The UTAUT model comprises four primary constructs: expectation of performance, expectation of effort, social effect, and favourable circumstances, which collectively impact the psychological desire to utilise technology. Since the original publication of UTAUT, it has functioned as a foundational model for examining diverse technologies across various organisational and non-organizational contexts. Despite the contributions of various studies in enhancing the understanding of UTAUT's applicability in specific contexts, there remains a necessity to theorise key factors relevant to gamification that can elucidate the essential elements for potential users. The study therefore proposed the hypothesis.

H_0: Ease of Use and Perceived Usefulness Influences Intention to adopt Gamified Learning

Performance Expectancy (PE) on Behavioural Intention (BI)

A major concern for researchers and professionals alike is the widespread use of learning systems. According to Liu et al. (2009), consumers' perceptions of the value of a service or technology for education greatly influence their decision to use it. Potential consumers are more likely to embrace when they hear that technology can be used to boost performance. In line with Roger's (1995) theory of innovation adoption, research shows that people are more likely to adapt to new technologies if they have experience with similar systems or if the features are familiar and standardised. It is only after some time has passed that the benefits of a certain technology start to show. Careful adopters pick up on the value of adoption and how to use it effectively by observing the results of other people's accepted activities (Neufeld, Dong & Higgins, 2007). Venkatesh et al. (2003) identified performance expectancy as a significant optimistic prediction of student's desire to utilise technology. Khechine et al. (2016) similarly identified that the enthusiasm for technology adoption stems from its perceived effectiveness, productivity, and histrionic returns. This research proposes the subsequent hypothesis:

H_1: Performance expectancy influences behavioural intention to use gamified IS in learning.

The influence of Effort Expectancy on Behavioural Intention

In the context of technology, "effort expectancy" means how easy one thinks it will be to use (Venkatesh, Thong, & Xu, 2016). The practicality of geographic information systems (GIS) for classroom use is the focus of this component. Martins, Oliveira, & Popovič (2014) and Venkatesh, Thong, & Xu (2012) found a strong positive association between effort expectancy and behavioural intention. This link is based on the idea that people are more likely to accept solutions that are easy to use (Martin et al., 2014). We suggest testing the following hypothesis based on our findings:

H_2: Effort expectancy influences behavioural intention to use gamified IS in learning.

Social influence (SI) and circumstances that facilitate Behavioural Intention (BI).
According to Venkatesh et al. (2003) and Venkatesh and Zhang (2010), social influence has a significant role in predicting the likelihood of behaviour change and the desire to adopt technology. As a cornerstone of numerous theoretical frameworks in behaviour change, the Theory of Reasoned Action has deepened our comprehension of how we embrace new technologies and the patterns of our own behaviour. According to the paradigm, people act according to their opinions and subjective norms, which stem from their behavioural intent. The willingness to use educational technology is positively correlated with opinions regarding their usage, according to numerous studies (Liu et al., 2009; Lee, 2010).

H_3: Social influence influences behavioural intention to use gamified IS.

H_4: Facilitating conditions influences behavioural intention to use gamified IS.

H_5: Attitude influences behavioural intention to use gamified IS.

Self-Determination Theory
In order to motivate and engage students in a technology-enhanced learning environment, this study seeks to answer the following question: How might gamification address students' fundamental psychological needs? The purpose of this study is to use self-determination theory (SDT) as a prism through which to examine how students interact with gamification. According to Kaplan and Haenlein (2010), one distinctive feature of gamification is the incorporation of user-generated material. This content turns the gamified information system (GIS) into a "social learning platform" where students engage in active collaboration, exchange ideas, and content creation. Students have a lot of say over their GIS experience, including the ability to choose goals, create or share assignments, choose motivating game features (such incentives or recognition), and receive learning notifications (Subhash & Cudney, 2018).

Before digital games were a part of most learning management systems, content was chosen by administrators or teachers and didn't usually have any social element. Because people couldn't start conversations, post comments, or participate, engagement was low in these settings. But now students may take an active role in their education by making their own content and choosing their own course of study, which encourages greater investment on their part. A crucial foundation for comprehending how aspects of game design can improve learning is, consequently, self-determination theory. Intrinsic motivation, introjected regulation, integrated regulation, external regulation, and amotivation are the five distinct forms of motivation that are identified by SDT as having an impact on behaviour (Deci & Ryan, 2008a; Vanskeenkiste et al., 2009).

The various aspects of extrinsic motivation are shown in Figure 1 of the SDT motivation continuum.

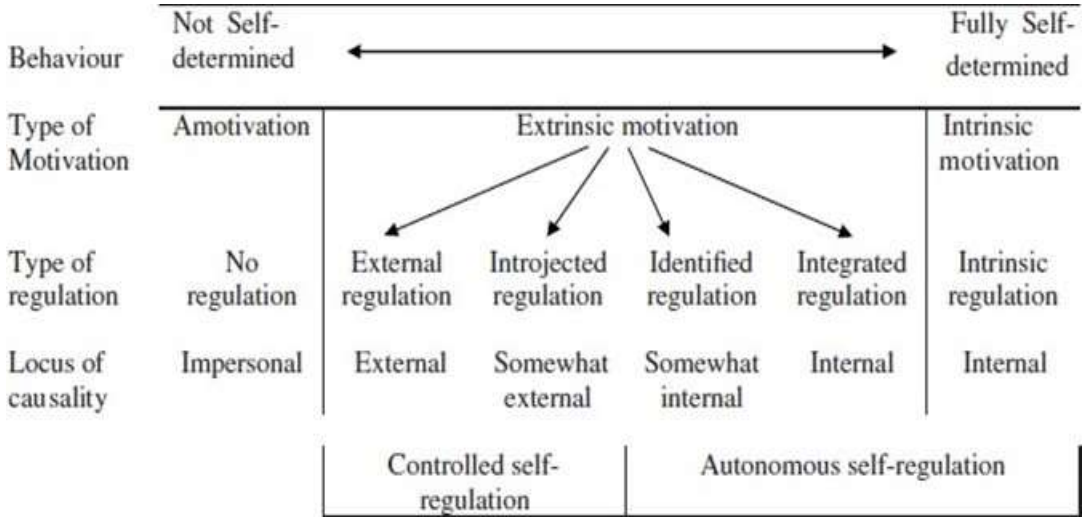

Figure 1: The Spectrum of Motivation According to SDT (Adapted from Deci & Ryan, 2000)

There is a continuum dependent on the degree to which each of the four remaining categories of motivation (insider motivation being the lowest form of self-determined drive) gets internalised. The term "internalisation" describes how people incorporate external rules into their sense of identity and give them significance in their own lives (Deci & Ryan, 2004, p.1). According to Deci and Ryan (2002), this process is in line with how people regard themselves as being in charge, or their "locus of causality," and how they see their behaviours as falling along a spectrum of self-regulation. Particularly important, say Deci and Ryan (1985; 2002), is intrinsic motivation, which is the desire to do things because you enjoy them or because they provide the best challenge.

When people are intrinsically motivated, they act in a way that makes them happy and fulfilled on a personal level. Intrinsic motivation and self-determined kinds of regulation, such identified regulation, are said to lead to beneficial results according to Self-Determination Theory (SDT). Unselfish forms, on the other hand, might lead to less desirable results; these include introjected regulation, amotivation, and external regulation. SDT, therefore, identifies certain psychological needs that, when fulfilled, serve as powerful motivators. These needs (autonomy, competence, and relatedness) energize individuals to engage actively with their environment, fostering behaviours driven by personal choice and agency (Deci & Ryan, 1985, 1987).

Deci, along with Ryan, contended that:
"It is part of the adaptive design of the human organism to engage in interesting activities,to exercise capacities, to pursue connectedness in social groups, and to integrate intrapsychic and interpersonal experiences into a relative unity" (p. 229).

4. CONCEPTUAL FRAMEWORKS

A method of analysis that may be used across different domains to give a unified viewpoint is a conceptual framework. Systematically organising thoughts and making concepts clearer are both helped by it. Before the 2020 COVID-19 pandemic, gamified learning technologies were not widely used and had a low profile (Suppan et al., 2020). Little is known about how certain elements of game design might promote learning and autonomy. The conceptual model of this study unites aspects of game design, intrinsic motivation (like enjoyment), satisfaction with needs (as described by the SDT model), and an essential supplementary component: student participation.

Figure 1.2 presents the Motivation and Engagement conceptual framework.

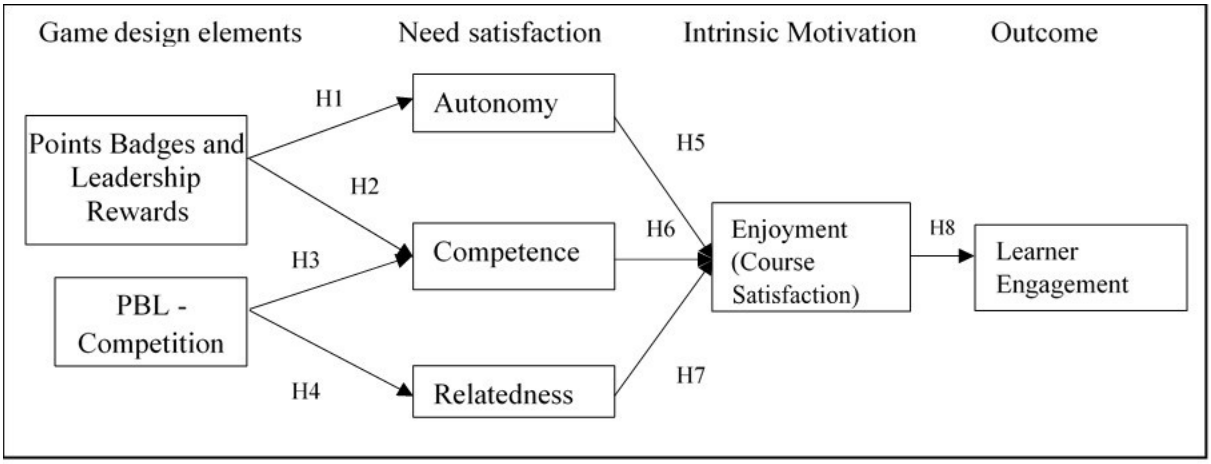

Figure 2: Conceptual Framework on Motivation and Engagement

According to Liu et al. (2017), educators, designers, and practitioners all agree that selecting successful game design features is a crucial subject. In Section 2.3, we talk about how points, leaderboards, and badges are fundamental aspects of game design that have been identified through a comprehensive literature review (Dellos, 2015; Wang, 2015; Göksün & Gürsoy, 2019). These elements were selected for their visibility to players and their expected alignment with the study's theoretical framework.

Points function as rewards and offer quick feedback by tracking players' in-game actions, often awarded for completing assignments (Sailer et al., 2013). Badges visually represent accomplishments, while leaderboards display rankings based on accumulated points or scores. Leaderboards can foster social pressure when students compete for top positions, potentially increasing engagement with the system. In contrast, performance graphs show individual progress over time, allowing students to monitor and improve their performance by tracking their achievements visually.

According to Kaplan and Haenlein (2010), students can develop a sense of agency by deciding for themselves what and how to share through activities such as developing relationships, presenting oneself, interacting, and exchanging learning resources. Practice quizzes can help students since they encourage participation through letting them experiment with different topics, select their own materials to publish, and engage in unrestricted interaction inside their gamified online spaces (Karahanna, Xu, Xu, (2018). Students can also participate in "competitive courses," form ranked groups, and take on difficult tests to encourage teamwork and individual achievement.

Given the information provided, the following theories are put forth:

H6: Points, badges, and leaderboards (PBL) as rewards influence autonomy need satisfaction in gamified IS.

H7: Points, badges, and leaderboards (PBL) as competition influences competence need satisfaction in gamified IS.

According to this theory, students can develop a better understanding of social issues by participating in games that incorporate elements like leaderboards, badges, and points.

Motivation-Opportunity-Ability Theory

Motivation, opportunity, and ability are three interrelated aspects that motivate people to take action; this theory is useful for studying how people's behaviours develop and how well they complete tasks (MacInnis et al., 1991). The three components of MOA continue to be fundamental to understanding behaviour, even though different fields may reorganise them. Both internal (drive and skill) and external (possibilities) elements influence whether a behaviour is present or not, as stated in the MOA model.

Elements such as desire, interest, readiness, and internal drive constitute what is known as motivation (Lai, Hsiao & Hsieh, 2018). People are more likely to exert the required effort when they can clearly see the reward at the end (Rothschild, 1999). Environmental factors can either help or impede growth, regardless of how motivated one is. Opportunity, on the other hand, indicates how accessible the resources to achieve a goal are. The term "opportunity" is used in this context to describe enabling environmental factors that make the attainment of objectives more likely.

Acquiring the necessary information, abilities, and mindsets to accomplish a goal is what we mean when we talk about ability.

This study also seeks to answer the following question: How does the interaction between a learner's potential, the quality of the information available to them, and their aesthetic experience affect their continued usage of gamification? The project intends to make a significant contribution to CU research in three important areas with this question: Aesthetic experience (AE), information technology capabilities (ITC), and information quality (IQ) are the key ideas in the MOA framework, which is used to anticipate CU in gamified information systems (GIS). Secondly, five hypotheses are developed and tested in the study.

Third, this study takes a fresh method by investigating the mediating roles of aesthetic experience, technological competence, and information quality in CU prediction inside GIS. This is interesting because these factors have not been extensively studied in this particular setting before. The research assumptions are described in greater detail in the sections that follow.

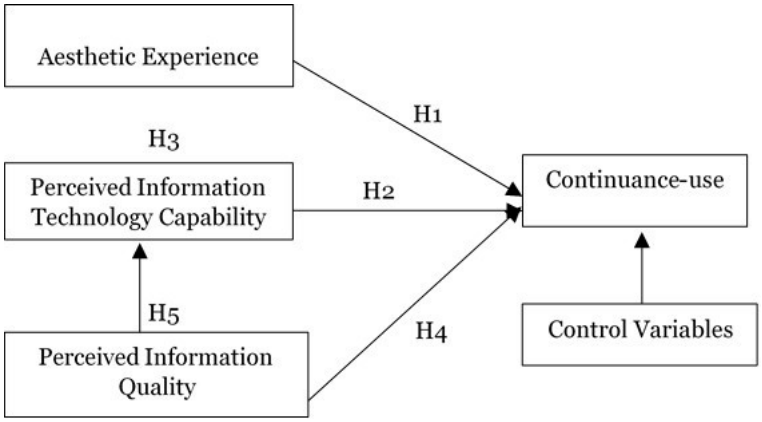

Figure 1.3: Conceptual Framework on Continuance Use

5. RESEARCH METHODOLOGY

An extensive literature review of gamification projects in universities throughout the world was carried out as part of the study. Next, the research will concentrate on Africa and Nigeria to assess the level of adoption using literature and practices. The research design will engage the critical realist point of view as its philosophical underpinning, The research scope was limited to the use of gamification for instructional purposes. The sample size will consist of instructors and students from Higher Educational Institutions and will be distributed across schools, gender, years of teaching experience, level of study and other demographic factors.

A questionnaire instrument will be designed to gather data from potential and current users on components use as well as experiences with gamification software if any. To personalise gamification according to learners' acceptance, participation, and willingness to continue using, the research will produce three-minute conceptual models. The next step is to undertake a large-scale study in a developing country setting to determine what factors influence the usage and uptake of gamification in the classroom.

A compelling and relevant integrated framework for higher education will be deconstructed using tables of decisions for quantitative judgements and meta-deduction inferences based on the findings of these investigations. A combined framework for gamification customisation will be developed by mapping the primary variables of the three frameworks. This will be done in response to the findings of the studies and the requirement of rendering the results practical for lecturers and designers in HEIs. In order to build effective gamification systems, inform policy and advise designs, and get a deeper understanding of the interplay between components, theoretical frameworks, and design features, mathematical modelling of structural equations will be used as a statistical tool.

6. CONTRIBUTIONS TO KNOWLEDGE

At the end of this study, the study was able to make these contributions:

Provide insights into the factors that impacts on the Utilization of gamification for instructional purposes in HEIs in Nigeria. To personalise gamification according to learners' acceptance, engagement, and intention to continue using, the research will produce three-minute conceptual models. The next step is to undertake a large-scale study in a developing country setting to determine what factors influence the usage and uptake of gamification in the classroom.

A compelling and relevant integrated framework for higher education was deconstructed using decision tables for quantitative inferences and meta-deduction inferences based on the findings of these investigations. An integrated model for gamification configuration was developed by mapping the main determinants of the three frameworks. The studies' findings necessitated this action so that HEI instructors and designers could put the findings into practice. We employed structural equation modelling, a statistical tool, to construct effective gamification systems, educate policy, advise designs, and analyse the interplay between components, theoretical frameworks, and design elements.

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