



Development of a User-Centered secured gamification model for specialized therapeutic information systems in Malaysia

Suhaila Samsuri*

Department of Information System, Kulliyah of Information & Communication Technology, International Islamic University Malaysia

Abstract

This study pertains to gamification technologies that incorporate gaming elements into therapeutic interventions to improve engagement. The methodology, in conjunction with psychospiritual treatment, provides a comprehensive framework essential for people with intricate sexual health challenges. A substantial deficiency exists in the secure integration of gamified solutions, as existing models overlook the essential security mechanisms required to protect sensitive personal data, hence generating ethical issues. This qualitative study included comprehensive, semi-structured interviews (n=30) with sex workers, men who have sex with men (MSM), and transgender individuals in Malaysia. Participants embraced gamification but expressed significant apprehensions about secrecy and security, stemming from fears of discrimination and a lack of confidence. They placed significant importance on intrinsic motivational factors, including psychospiritual methods such as the Sufi approach. The study presents a revised secure gamification paradigm consisting of five fundamental components: User, Gamification elements, Motivational elements, Secured user profile, and user-centered considerations. This comfortable integration promotes intrinsic drive and improves health outcomes.

Keywords: Development, User-Centered secured, Therapeutic information systems

1. Introduction

Gamification in health therapy refers to the application of game design elements and principles, such as, rewards, challenges, progress tracking, and feedback to enhance patient engagement, motivation, and adherence to therapeutic interventions. It can be applied both in mental health therapy and physical rehabilitation to make therapy more interactive, enjoyable, and effective. In mental health, gamification is used in Therapies For Anxiety, Depression, PTSD, and cognitive behavioral therapy by integrating virtual reality, quizzes, puzzles, and mini games to engage patients and foster skill development.

Meanwhile, psychospiritual therapy integrates psychological principles with spiritual understanding, offering a holistic approach to mental health treatment. This method recognizes the interconnectedness of mind, body, and spirit, providing a comprehensive framework for healing and personal growth. This therapy can be particularly beneficial for patients dealing with sexual health issues, as it acknowledges the complex interplay between mental well-being, sexual functioning, and spiritual beliefs. Addressing mental health in patients

with sexual health issues is crucial, particularly for those with Severe Mental Illness (SMI) who may engage in high-risk sexual behaviors. Effective interventions can help reduce the incidence of Sexually Transmitted Infections (STIs) and improve overall well-being. Sexual health issues can exacerbate mental health conditions, leading to feelings of shame, anxiety, and depression. Conversely, untreated mental health issues can hinder individuals' ability to engage in safe sexual practices and seek necessary care [1]. Individuals with SMI often exhibit higher rates of high-risk sexual behaviors, such as unprotected intercourse and multiple partners, which increase their vulnerability to STIs and other sexual health problems [2]. By integrating psychological support with spiritual exploration, with the help of gamification technology, this approach can enhance self-awareness, securely improve communication skills, and foster healing from emotional barriers related to sexuality. As interest in holistic treatment methods grows, psychospiritual therapy stands out as an effective option for promoting overall well-being in individuals facing sexual health challenges.

The significance of data protection in gamification for psychospiritual therapy is paramount, considering

the sensitive nature of the material and the potential risks linked to the mishandling of user data. Data protection procedures are crucial to guarantee that users' personal information is managed with dignity and confidentiality. In psychospiritual therapy, where individuals may disclose sensitive emotional and psychological information, it is essential to establish robust privacy rules. This entails acquiring informed consent from consumers concerning the collection, utilization, and storage of their data, alongside with data minimization methods to gather only what is essential for therapeutic objectives [3]. Effective data privacy also cultivates confidence between users and therapists or gamification providers. Users are more inclined to participate with gamified therapeutic applications when they are assured of the security of their information and the respect for their privacy. Transparency in data management techniques may boost user confidence, resulting in improved involvement and success in therapy [3][4]. In the absence of robust data protection, user data is vulnerable to modification or exploitation for undesired ends. If user profiles are exploited to induce excessive involvement using manipulative gamification strategies, it may result in adverse psychological effects on users. Ethical considerations must be prioritized to prevent such tragedies [4][5]. Ensuring that users have control over their data can help mitigate these risks. The most important requirements are it must be compliance with Regulations, such as GDPR or PDPA, 2010 (Malaysia Personal Data Protection Act). It is essential for any gamified system managing personal health information. Non-compliance may result in significant legal consequences and tarnish the reputation of the organizations implicated. Implementing governance frameworks that guarantee adherence to these regulations safeguards both users and providers [3][4].

Despite the growing interest in gamification as a potential method to improve mental health and therapeutic results, a considerable gap persists in the incorporation of gamified therapies within psychospiritual therapy, particularly for delicate and intricate disorders like sexual health difficulties. This study focuses on research aimed at addressing the issue of insufficient security in gamification for sensitive health data. Current gamification approaches predominantly emphasize incentive and

engagement, although frequently neglect comprehensive security protocols that safeguard privacy and protect the highly sensitive personal and psychospiritual information of patients in therapy. This disparity presents ethical and practical dilemmas, as apprehensions regarding data security and confidentiality may hinder user trust, treatment compliance, and therapeutic efficacy. Furthermore, psychospiritual treatment encompasses very personal and transforming processes necessitating customized, culturally attuned methodologies that existing generic gamification frameworks fail to sufficiently address. Consequently, there is an immediate necessity to create a secure gamification model tailored for psychospiritual therapy, which enhances therapeutic involvement while protecting client confidentiality, thus increasing treatment outcomes for adults with sexual health concerns [3].

While gamification can enhance motivation and accessibility in sexual-therapy management, it also introduces significant risks. These include privacy and data-re-identification threats, potential coercion or shame from reward-driven designs, manipulation of autonomy due to opaque game mechanics, boundary violations from intrusive personalization or social features, and a risk that the therapeutic focus is overshadowed by entertainment-oriented game elements.

Employing gamification as a mechanism for overseeing the intervention program aims to enhance user engagement and motivation. Gamification, the incorporation of game-like aspects into non-game environments, has emerged as a potential strategy in psychospiritual therapy, notably in augmenting client involvement and drive. This methodology can be especially efficacious in mental health interventions, since conventional methods may falter in sustaining user engagement or addressing specialized psychological requirements. As gamification becomes increasingly integrated into mental health treatment, ensuring the security and privacy of patient data is paramount. The use of gamified elements in therapeutic contexts, such as apps and online platforms, introduces unique challenges and considerations regarding data protection, ethical use, and user safety.

Following developments of this concept, the next

phase involves the design and development of a mobile gamification application for clinicians and experts within the Department of Family Health, Kulliyyah of Medicine IIUM, to track the progress of patients experiencing sexual health issues. Therefore, the application will undergo qualitative and quantitative evaluation and validation for utilization by physicians at Sultan Ahmad Shah Medical Center, Kuantan.

This paper primarily presents the initial phase of a study on the construction of a therapeutic gamification model and examines the findings related to secured gamification for psychospiritual therapy, based on the following research topics;

1. How can a secured gamification model be effectively designed and implemented to enhance engagement and therapeutic outcomes in psychospiritual therapy for individuals with sexual health issues?
2. What are the perceptions and experiences of individuals with sexual health issues regarding the privacy, security, and effectiveness of a gamified psychospiritual therapy model?

These questions focus on both the design and implementation of a secure gamification framework tailored for psychospiritual therapy and on understanding user acceptance and trust concerning privacy and security in this sensitive context.

2.0 Related work

Gamification in mental health therapy signifies a viable strategy for enhancing the attractiveness, engagement, and effectiveness of digital interventions. Research emphasizes the necessity of creating gamified experiences that harmonize individuality with uniformity, maintain engagement without excessive rewards, and utilize immersive technologies. Attention to security, data privacy, and ethical considerations are essential requirements for providing reliable and effective gamified therapy for mental health [6][7]. This research examines the application of gamification in mental health therapy, utilizing a psychospiritual therapeutic approach. Psychospiritual treatment distinctly aids people with sexual illnesses by tackling mental health issues through an integrated psychological and spiritual

approach. Prioritizing individualized spiritual beliefs and holistic healing can alleviate emotional pain, promote self-acceptance, and improve therapy results for mental health issues related to sexual health [8][9]. Psychospiritual therapy combines psychological interventions with spiritual dimensions, helping individuals explore meaning, values, identity, and connection beyond physical symptoms. This can be crucial for sexual health issues where shame, guilt, trauma, and identity conflicts are common [10]. Therapy often includes sexual therapy techniques such as Cognitive-Behavioral Therapy (CBT) for sexual dysfunction, mindfulness-based approaches to reduce performance anxiety, education about sexual function, and couple's therapy to address relational aspects. Individuals with sexual diseases (e.g., STDs) frequently face stigma, anxiety, depression, and identity concerns. Psychospiritual therapy supports emotional healing by embedding spiritual meaning, fostering self-acceptance, and reducing isolation. One model studied involved phases combining religious teachings, self-esteem building, and mental therapy for recovery from sexual misbehaviour including transgender-related challenges, demonstrating positive improvements through integrating Quranic spiritual elements [8]. Methods like Subconscious Energy Healing Therapy (SEHT) blend emotional freedom techniques, mindfulness, and spiritual practices to address trauma-related emotional distress, self-harm, and low self-esteem in adolescents, showing effectiveness in mental health recovery [9].

Psychospiritual therapeutic methods for managing mental health issues integrate psychological techniques with spiritual activities to facilitate comprehensive recovery. There are several techniques commonly used in this method of therapy, such as mindfulness meditation, breathwork, reflective inquiry and sufism technique. Mindfulness practices encourage individuals to focus on the present moment, fostering awareness of thoughts, feelings, and bodily sensations. Regular meditation can reduce anxiety and depression, enhance emotional regulation, and promote a sense of inner peace. Then, controlled breathing techniques can help individuals manage stress and anxiety by calming the nervous system. Practices such as deep diaphragmatic breathing or specific Sufi breathing

exercises can facilitate emotional release and grounding. Reflective Inquiry is a technique involves exploring personal experiences through guided questioning, allowing individuals to gain deeper insights into their emotions and behaviors. Therapists facilitate discussions that encourage self-reflection, helping clients understand the root causes of their mental health issues. Finally, sufism technique, which incorporating spiritual rituals such as prayer, visualization, or sacred texts can enhance the therapeutic process. Clients may engage in practices that resonate with their spiritual beliefs to foster a sense of connection and purpose [11] [12] [13].

This study mainly referred to the proposed model by Jamaludin [16] in 2021. The proposed depression diagnosis model is founded on gamification techniques and is intended to serve as the blueprint for developing a mobile application system that ensures continuous engagement for adolescents in self-diagnosing depression. This model integrates three main design ideas: gamification elements, user types, and motivational elements. The design elements were derived from survey findings identifying adolescent motivation enhancement factors. The system is anticipated to use diagnostic methods based on the Computerized Cognitive-Behavioural Therapy (CCBT) module to detect depression levels.

3.0 Research Methodology

This research employed qualitative approach to get opinions from individuals with sexually transmitted diseases. It is crucial for comprehending their experiences, requirements, and perceptions of care in detail. Using in-depth interviews with semi-structured questions is highly suitable for exploring whether individuals with sexual diseases can accept gamification as a therapeutic platform for their psychospiritual therapy. Semi-structured interviews allow researchers to prepare guiding questions about gamification therapy acceptance while enabling participants to freely express thoughts, feelings, and concerns. This flexibility is critical for sensitive topics like sexual diseases and new treatment approaches. Sensitive issues require trustful, confidential settings that interviews facilitate better than surveys. They allow empathetic probing and clarifications, helping

participants reflect more authentically on gamification acceptance [15].

The selection of semi-structured interviews with sexual-health patients as the methodology for developing the gamified therapeutic program was justified by the sensitive, stigmatized, and context-specific nature of sexual health. Interviews enabled exploration of patients' lived experiences, boundaries, and concerns regarding privacy, shame, and coercion, which could not be sufficiently captured by standardized surveys alone. This approach supported a co-design process in which patients contributed to defining acceptable game mechanics, feedback structures, and safety-related constraints. Given the formative nature of this research, interviews provided the rich qualitative foundation needed to build an ethically grounded, culturally appropriate, and patient-centred gamified therapeutic program that would later be tested quantitatively [21].

Thematic analysis was used to identify patterns across transcripts, supported by an iterative coding process, peer review of a random subset of data, and careful documentation of analytical decisions. To enhance trustworthiness, the study employed prolonged engagement, member checking with a subset of participants, reflexivity through a research journal, and a detailed audit trail. This approach ensured that findings were credible, transparent, and relevant to the design of a patient-centred, ethically grounded gamified therapeutic program.

3.1 Data collection

Here are the details for the sampling technique, data analysis method, and validation procedures conducted in this study:

i. Sampling technique

Target Population: The study targeted individuals facing sexual health challenges, specifically Sexually Transmitted Infections (STIs), sexual dysfunctions, and hormonal imbalances.

Participant Demographics: The sample consisted of 30 participants ($n=30$) ranging in age from 20 to 70 years old. The group was predominantly made up of sex workers, men who have sex with men

(MSM), and transgender individuals located in a specific state in Malaysia.

Data collection method: The researchers gathered data through comprehensive, in-depth, semi-structured interviews lasting between 20 and 60 minutes. This approach was chosen to accommodate the sensitive and stigmatized nature of sexual diseases, allowing participants to freely express their lived experiences, concerns, and boundaries regarding privacy and gamification.

ii. Data analysis method

Thematic Analysis: The primary method used to evaluate the qualitative data was thematic analysis which allowed researchers to identify recurring themes and patterns across the participant transcripts.

Iterative coding: The thematic analysis was driven by an iterative coding process.

Data preparation: To prepare the data for coding, the interview sessions were audio-recorded verbatim (with written consent from participants) and subsequently transcribed. During transcription, interviewers also noted non-verbal cues to capture deeper emotional and contextual insights.

iii. Validation procedures

To guarantee that the qualitative findings were credible, transparent, and trustworthy, the researchers implemented a robust set of validation procedures:

Peer review: A random subset of the data underwent peer review to verify the coding and thematic extraction.

Member checking: The researchers shared findings

with a subset of the participants so they could verify that their thoughts, experiences, and perspectives were accurately captured and interpreted.

Audit trail: The study maintained careful and detailed documentation of all analytical decisions made throughout the research process.

Prolonged engagement: The researchers spent extended time engaging with the subject matter and participants to build rapport and ensure a deep, authentic understanding of the sensitive context.

Reflexivity: The research team maintained a research journal to reflect on their own biases and perspectives, ensuring these did not improperly influence the qualitative analysis.

3.2 Ethical consideration

Academically, interviewing individuals with Sexually Transmitted Diseases (STDs) requires meticulous ethical considerations, sensitivity, and strategies to ensure confidentiality and establish rapport. Participants were thoroughly notified of the interview's objective, the safeguarding of their data, and the voluntary aspect of their participation. Confidentiality and anonymity were strictly preserved to save participants from stigma or discrimination. Documentation, including informed consent forms and respondent information sheets, was also provided.

The study received ethical approval from relevant research ethics committees prior to commencement. Interviews were conducted utilizing a semi-structured framework, permitting flexibility for participants to articulate their experiences while addressing essential study topics. Interviews were audio-recorded with consent for precision, and the data was securely saved and anonymized during analysis to protect participant identities.

Table 1: Semi-structured questionnaires based on the gamification model components

Component	Semi-structured questions
Gamification element	How ready do you feel to incorporate gamification into your therapeutic or professional practice? Which specific gamification mechanics and components do you find most

	appealing or effective for engaging clients?
Motivational element	How do you perceive the role of psychospiritual elements in enhancing the effectiveness of psychotherapy when integrated with gamification techniques? Why do you believe their inclusion is important for holistic healing and engagement?
Secured user profiling	What are your concerns or considerations regarding privacy when using gamification in psychospiritual therapy? How do you think this privacy issues should be addressed to protect clients' confidentiality and trust?
User-centered	How important do you think it is for gamification in therapy to include user-centered features? What specific elements would you prioritize to ensure the experience is personalized and meaningful for each user?

3.4 Analysis

Because the study aligns its findings with a specific gamification model, the overarching themes can be categorized according to those structural components, with specific sub-codes derived directly from the participants' expressed needs, fears, and preferences.

Theme 1: Gamification Acceptability and Mechanics

This theme captures how users perceive the implementation of a gamified app as a substitute or enhancement for physical therapy programs.

Theme 2: Motivational Drivers

This theme encompasses the factors that encourage participants to engage in the psychospiritual therapy process, divided into intrinsic and extrinsic drivers.

Theme 3: Privacy, Security, and Trust (Secured Profiling)

This theme deals with the significant apprehensions participants have regarding the handling of their highly sensitive personal data.

Theme 4: User-Centered Interface and Experience (UX/UI)

This theme focuses on the specific design elements, features, and content that participants need to feel comfortable and engaged with the application

During an iterative coding process, our researchers would apply these specific codes to the raw interview

transcripts, identifying patterns to ensure the final application design directly mitigates user fears (e.g., implementing strict role-based access control) while maximizing engagement through tailored spiritual content and accessible design.

4.0 Findings

List of the questions prepared for the respondents and some common answers extracted to help in our design and development. This article only reports the most prevalent responses deemed beneficial for the construction of our gamification model. The findings were extracted into several factors to be adapted from study by Jamaludin et. al [16] into the gamification model framework: motivational elements (applying psychospiritual element under its intrinsic factor), gamification elements, user interaction design elements and for this study we add user profiling element for personal data privacy.

4.1 Gamification element

Understanding the distinction between game mechanics and game components is essential for effectively designing gamified systems. Game mechanics refer to the rules and processes that govern how users interact with the game components. They dictate the actions users can take and how those actions affect the game state. Important mechanics include, competition, progression, rewards and storytelling. Game components are the foundational elements that make up a gamified experience. They serve as the building blocks that define how a game or gamified system operates. Key components include points, levels, leaderboards, badges and challenges/quests. These

mechanics are vital for shaping user behavior and ensuring that interactions within the gamified system are meaningful and rewarding [17].

Based on the responds, 10 out of 30 participants are adequately prepared for the use of gamification in their mental intervention program. Only 3 out of 10 respondents provide with detail opinion based on the interview questions.

“We like it because it will be good to monitor the activities of every one of us towards transformation to a better life. We want to prevent them from going back to becoming a sex worker. It can be good to give us information faster rather than having to wait for the next program by doctors or religion teachers which we may have no time for any time.”(R1)

“Most of us don't have transport and have no enough spare time, so it may be hard to join the psychospiritual programs physically. Sometimes if the speaker isn't sensitive enough it can cause fights and misunderstandings. Even now some reporters will exaggerate in their articles about our programs saying we are supporting either both extremes of religion and so forth. This gamification can help us to have our privacy.” (R5)

“We are hoping to see that this gamification application can help us to learn these things from Nusantara Camp without having to go there. Because it will take time and money that we don't have a lot to fund our trip. Besides that, we have no more ideas on how this can help us until we test using it ourselves.” (R3)

4.2 Motivational element

Motivational theory distinguishes between intrinsic and extrinsic motivation, both of which play crucial roles in driving human behaviour. Understanding these concepts can enhance approaches in various fields, including education, workplace management, and personal development. Intrinsic motivation refers to engaging in an activity for its inherent satisfaction or enjoyment rather than for some separable consequence. This type of motivation arises from within the individual and is driven by personal interest, curiosity, or the joy of the activity itself. Extrinsic motivation involves performing an

activity to achieve an external reward or avoid a punishment. This motivation is driven by factors outside the individual, such as incentives or recognition [18].

The psychospiritual element plays a significant role in intrinsic motivation, influencing individuals' behaviours, choices, and overall well-being. Understanding this relationship is crucial for mental health professionals, educators, and anyone involved in personal development. The effectiveness of psychospiritual techniques as intrinsic motivational factors lies in their ability to align personal values, enhance self-awareness, foster emotional resilience, promote autonomy, build community connections, focus on the journey, and cultivate mindfulness. By integrating these elements into personal development strategies or therapeutic practices, individuals can experience deeper engagement and fulfilment in their pursuits. Ultimately, psychospirituality not only supports intrinsic motivation but also empowers individuals to take charge of their lives in meaningful ways.

Some of the interview findings about the psychospiritual technique;

“The Sufi approach is effective. The program increases our knowledge of the fundamentals of meditation and ritual as well as the need of a sexual healthy lifestyle education in avoiding hormone injections and HIV.”(R4)

“The Nusantara Camp program is helpful. In addition, they also rewarding us with holiday package. Although it is a good initiative, it is not for the long term as the money is needed more.”(R3)

“The Nusantara Camp brings a lot of good impacts to help towards improving ourselves, especially in religion. It is very helpful when we have a good mindset towards it. Activities like learning meditation, prayer, sports and team bonding with people who are relatable are very good.” (R9)

“The effective therapy is religious program such as Nusantara Camp, where we get to learn about the basic technique of ritual and pray according to our religion, learn knowledge about hormones and side effects of it. We also prefer programs that are provided by medical

doctors because we trust them for being very helpful even financially.”(R11)

4.3 Secured user profiling

User profiling is a multifaceted approach that combines demographic, psychographic, behavioural, social, technological, emotional, and lifecycle data to create comprehensive profiles of users. These profiles enable businesses to personalize experiences, improve targeting in marketing campaigns, and ultimately enhance customer satisfaction and loyalty. Regular updates to these profiles ensure they remain relevant as user behaviours and preferences evolve.

The significance of secure user communication and profiling was also emphasized during the interview session.

“We really like the idea of having easy communication to ask sufi or religion teacher for any questions that we may have. But for the specialist doctor, we are ok if it is about general medical but if it’s specifically to cater the medical issues regarding us would be risky.”(R21)

“This gamification is quite risky because we do not know how secure it would be to share our personal and sensitive problems. We always faced discrimination from government doctors and most of them aren’t being sensitive towards us. They may also not have the honesty to keep their secrets safe and it could spread and create prejudice.”(R24)

4.5 User-Centered

Gamification in user interaction design leverages game-like elements to enhance user engagement, motivation, and overall experience in non-gaming contexts, such as websites and mobile applications. This approach transforms mundane tasks into interactive and enjoyable experiences, encouraging users to participate actively. By incorporating game mechanics thoughtfully and focusing on user-centred design principles, developers can create compelling experiences that motivate users and foster long-term loyalty. Balancing fun elements with meaningful interactions is key to successful gamification in UX design.

Some of user interaction and experience design suggestions;

“If the app has a reminder for our meditation and ritual would be good for us. Adding some 1-2 minutes reading materials like from the Quran or Hadith is also nice.”(R3)

“I think having a direct call feature to a doctor or a religion teacher will help us when we need help quickly.” (R7)

“We would suggest including reading materials that benefit us. For example, the basics of praying methods, health facts related to our community, and maybe something on economics like insurance info that can be beneficial for us.” (R13)

“For us the colour is not an issue, but the text should be big and clear to read. Even with the option of changing the layout colour, it would be complex for us to do, so better to stick with only one design.” (R14)

“We hope that you guys will be sensitive about this to make sure not to offend any of us. For example, avoid using songs and pictures that may be controversial or have double meanings. For music, instrumental would be the safest. Also, try to reduce the number of words that we need to read and add more pictures and graphics instead. We are ok with any colours that will be implemented.” (R21)

“The design must be clear, and the colour should be striking and not too bright. You must avoid designs that look crowded for our eyes. Just make sure it is simple and direct for us to interact and understand how to use it. Fonts should be simple and big for us to read easily.” (R25)

5.0 Discussion

In light of our findings, we modify the proposed approach [16] into an alternative model for secure gamification intended for psychospiritual therapy. Figure 1 depicts the modified methodology comprising elements for each component model.

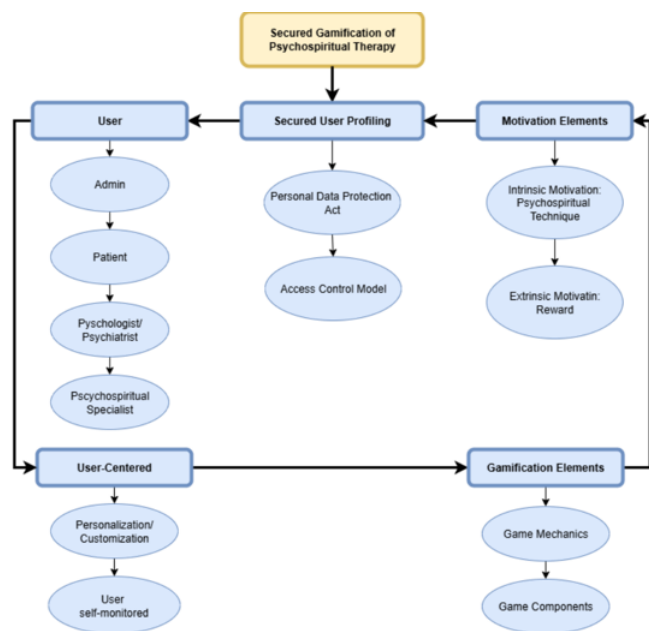


Figure 1: Proposed model for secured gamification of psychospiritual Therapy

The component for this gamification consists of user, gamification element, motivational element, secured user-profile and user-centred factors. The details of each component are as follows;

i. Component 1 - User

(a) Admin: working on administrating the whole system for all actors' accessibility and maintenance; Patient, Psychologist or Psychiatrist and Psychospiritual specialist.

(b) Patient: User profiling registration to undergo all activities designed under motivational theory – intrinsic motivation (implementing psychospiritual technique) and extrinsic motivation (developed under game mechanic as quantifiable rewards based on the commitment and progress of the patient in following all the required activities for the treatment program.

(c) Psychologist or psychiatrist: User profiling registration as a certified and authorized user who give the service to the patient, for instance, monitoring the progress and the effectiveness of the therapy towards patient's mental health, online consultation, follow-up treatment.

(d) Psychospiritual Specialist: User profiling registration as a certified specialist who update the psychospiritual activity to be followed by patients in the gamification system.

i. Component 2 - Gamification elements

(a) Game mechanic: Competition among the participants who register the intervention program, progression of participant on every activity initiated by psychospiritual specialist, various rewards (for extrinsic motivation) can be granted to those who collected highest number of badges or top ranking on the leaderboard, narrative or storytelling is how the activities being arranged from beginning to the end of the treatment program.

(b) Game component: points for every activity performed, badges for the commitment to do all the activities suggested, leaderboards to show the rank of the patients' achievement among them throughout certain period of time, levels of achievement and challenges (designed under activity program).

ii. Component 3 - Motivational elements

(a) Intrinsic motivation: using psychospiritual technique suggested, designed and updated by psychospiritual specialist with the guidance from psychologist or psychiatrist.

(b) Extrinsic motivation: real reward based on points collected or type of badge (gold, silver or bronze) or leaderboard achievement. This reward is redeemable, it could be in the form of money, free special treatment session, travelling and many more.

iii. Component 4 – Secured user profile

(a) Personal Data Protection Act: The implementation of gamification must adhere precisely to the criteria established by the personal information privacy statute imposed in the country. In Malaysia, we adhere to the Personal Data Protection Act of 2010.

(b) Access Control Model: This condition must adhere to the concepts of privacy by design and privacy engineering, as gamification involves the acquisition of personally identifiable information, particularly

sensitive data related to mental health records. Furthermore, different type of users engages in gamification, necessitating the implementation of an access control mechanism to restrict accessibility according to the data's nature and the user's classification.

(c) In a gamified system (especially for therapy or mental-health-related use), you can describe security mechanisms as three complementary layers: role-based access control (RBAC), Multi-Factor Authentication (MFA), and anonymised (or pseudonymised) data handling. The system employs role-based access control to restrict data and functionality according to user roles (client, therapist, administrator), ensuring that only authorized personnel can access sensitive information or modify gamification rules. Multi-factor authentication safeguards user logins and critical operations, reducing the likelihood of account compromise. Additionally, user-level activity data used for gamification (e.g., points, badges, mood logs) are anonymised or pseudonymised, so that behavioral analytics do not directly expose identifying information while still supporting personalized therapeutic experiences.

iv. Component 5 - User-centered (related with user interface and experience design) : (a) Personalization or customization: The adaptation of game-like elements and experiences to meet the unique needs, preferences, and characteristics of individual users. This tailored approach aims to enhance user engagement, motivation, and overall effectiveness in various contexts.

(b) User self-monitored: The practice of individuals tracking their behaviours, progress, and achievements within a gamified system. This approach leverages game design elements to encourage users to engage in self-reflection and enhance their motivation toward achieving personal goals. The gamification algorithm tracks user score and session progress, and awards badges or levels when predefined thresholds are met.

(c) Feedback: Immediate responses to user actions, such as notifications of points earned or levels achieved, which help maintain motivation.

Figure 2 illustrates the gamification architecture derived from the proposed model as modified from [19] with the details elements of gamification suggested by [20].

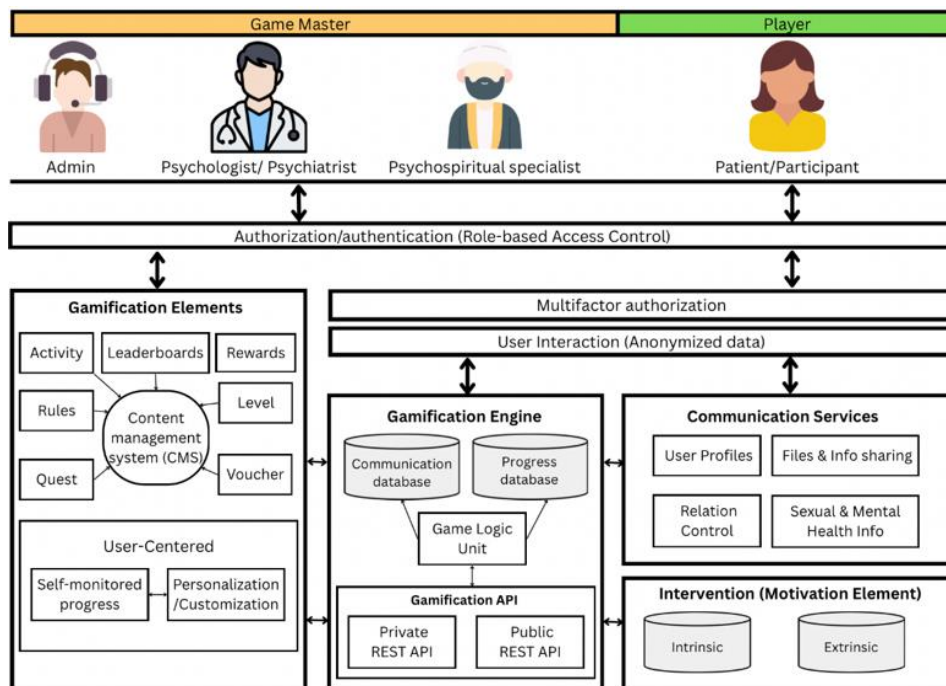


Figure 2: The gamification architecture

Although the study explicitly states that the development of the detailed therapeutic algorithm is reserved for future research, the sources outline a clear blueprint for the types of algorithms required to run this secured gamification model:

i. Diagnostic and therapeutic algorithms

CCBT Logic: The system's underlying diagnostic methods are anticipated to be based on the Computerized Cognitive-Behavioural Therapy (CCBT) module. This algorithmic logic would be used to detect depression levels and mental health progress.

Artificial Intelligence (AI): The future architecture will integrate AI algorithms specifically designed to facilitate patient self-therapy and guide them through their interventions.

ii. Security and data protection algorithms

To safely handle highly sensitive sexual health data, the system requires algorithms that enforce three complementary security layers:

Role-Based Access Control (RBAC): Algorithms to strictly restrict data and functionality based on the user's specific role (e.g., patient, psychologist, psychospiritual specialist, or admin).

Multi-Factor Authentication (MFA): Algorithms to safeguard user logins and protect critical operations from account compromise.

Anonymization and pseudonymization: Algorithms that strip or mask identifying information from user-level activity data (such as mood logs, points, and badges) so that behavioral analytics can run without exposing the patient's identity.

iii. Gamification and reward mechanics algorithms

Progression tracking: The system needs algorithms to dictate game mechanics, specifically how actions translate into game components like points, levels, leaderboards, and badges.

Extrinsic reward conversion: The algorithm must be able to track a user's commitment to

psychospiritual activities and translate their top rankings or badge collections into tangible, redeemable rewards, such as money, travel packages, or free special treatment sessions.

iii. Self-Monitoring and synchronization algorithms

Real-time Feedback Loops: Algorithms are required to process short, daily patient interactions—such as mood check-ins or daily logs—and instantly translate them into scores and visual feedback to maintain user motivation.

Clinical synchronization: The system needs an algorithm to continuously synchronize these gamified data streams with electronic health records or clinician dashboards. This allows authorized healthcare providers to monitor patient progress and detect early risks without shifting the burden of tracking entirely onto the patient

Conclusions and Future Study

The integration of secured gamification with psychospiritual therapy presents a promising approach to enhance sexual health education and promote healthier behaviours among patients. This combination leverages the engaging aspects of gamification while addressing the psychological and spiritual dimensions of health, making it particularly relevant for sexual health interventions. Studies show that Game-Based Learning (GBL) significantly improves sexual health literacy among adolescents, making it a more effective method compared to traditional educational approaches. Gamified interventions can effectively reinforce healthy sexual decision-making and reduce risky behaviours by providing interactive and personalized learning environments.

Psychospiritual therapy addresses the psychological and spiritual aspects of an individual's health, emphasizing personal values, emotional resilience, and self-awareness. By aligning suitable content with users' spiritual beliefs and values, psychospiritual therapy enhances intrinsic motivation to engage in healthy behaviours. Techniques such as mindfulness and self-assessment can help individuals reflect on their sexual health habits, leading to more ethical

decision-making. Security is a critical consideration in any gamified intervention, especially in sensitive areas like sexual health. Secured gamification ensures that personal information collected through gamified platforms is safeguarded against breaches, fostering trust among users. By leveraging the engaging nature of gamification alongside the holistic benefits of psychospiritual approaches, this method can foster deeper engagement, intrinsic motivation, and improved health outcomes. Future research should explore practical implementations and assess the effectiveness of this combined approach in various contexts.

Self-monitored gamification should be integrated into the healthcare system by embedding gamified self-management tasks within existing clinical workflows, such as symptom tracking, medication adherence, and therapy-exercise programs. Patients self-monitor their progress using short, engaging interactions (e.g., mood check-ins, daily logs), which are translated into scores, badges, and visual feedback that reinforce positive behaviors. These gamified data streams are synchronized with electronic health records or clinician dashboards, allowing early risk detection and plan adjustments. By reducing the burden of self-reporting, increasing motivation, and visualizing progress, gamification helps ease therapy programs, improve adherence, and support longer-term engagement without shifting responsibility away from clinicians.

In future research, we proceed to the following phase, which involves development of a secure therapeutic gamification application intended for sexual health therapy. We will incorporate the detailed algorithm of the therapeutic system, the technical security mechanisms of the user profile system, and integrate artificial intelligence for patient self-therapy. The app's feedback and effectiveness will be assessed both qualitatively and quantitatively to validate its adoption in the healthcare setting.

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this study.

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