

AN EDUCATIONAL APPLICATION -ASSISTED BOARD GAME FOR PSYCHOLOGICAL FIRST AID LEARNING AMONG PRE-CADETS

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Abstract

Background: Mental health issues are commonly observed among Thai pre-cadets. Psychological First Aid (PFA) is essential for managing crises and trauma; however, conventional training methods frequently lack sufficient engagement and practical implementation. Game-based learning, informed by self-determination theory, offers a potentially more motivating and interactive way to acquire and apply PFA skills. By incorporating gamification into PFA training, this novel approach aims to enhance the practice of emotional coping skills.

Objectives: This study aimed to develop and evaluate an application-assisted board game for PFA learning among pre-cadets. The game's feasibility was assessed using pre- and postintervention self-assessment competency tests and overall satisfaction ratings. Examining the participants' perspectives on mental health issues and their perceptions of the intervention was a secondary goal.

Methods: The board game LuXid Dream was created as a collaborative tabletop experience enhanced by a web-based application (www.luxiddreampfa.com). The website guides players through setup, rules, and feedback on results. The study used a pre- and post-experimental design with 50 pre-cadets aged 16 to 18. Participants with severe mental illness or incomplete research forms were excluded from the study.

Results: The study showed a significant increase in self-evaluated competency scores, from 3.60 (± 0.64) to 3.89 (± 0.57) ($p < 0.05$). Overall satisfaction scores were generally positive, indicating agreement on the game's usefulness, ease of use, and enjoyment.

Conclusion: The application-assisted board game "LuXid Dream" is a feasible method for PFA learning. It can elevate mental health awareness, motivate learning, and advance understanding of PFA concepts among pre-cadets, potentially serving as a model for improving mental health literacy among teenagers.

Keywords: psychological first aid, educational game, application-assisted board game, pre-cadets, and adolescent

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Introduction

Based on the Global Burden of Disease Study 2019,⁽¹⁾ nearly 15% of all illnesses among individuals aged 10-19 in Thailand are attributed to mental health issues in children and adolescents, with suicide ranking as the third leading cause of death among adolescents aged 15-19. According to the report of the World Health Organization 2018,⁽²⁾ the estimation of child and adolescent mental illness is approximately 13% of the total population aged 10-19 years old around the world. The mental health problems include depression, anxiety, and behavioral issues. These problems cause long-term illness and disability in adolescents. However, the inaccessible service is a limitation for potential growth.

The COVID-19 outbreak disrupted adolescents and children's lives. The lockdown policy has diminished everyday social interactions and outdoor activities, which are crucial components in developing emotional resilience among the youth. A systematic analysis of the effect of COVID-19 lockdowns on mental health found that anxiety and depression rates among children and adolescents increased significantly during the pandemic, rising to 57.4% and 39.3%, respectively.⁽³⁾ Factors affecting anxiety symptoms entail unusual daily patterns, gender (mainly female), adolescence, heightened exposure to COVID-19 information, use of social media, and the presence of underlying psychiatric conditions like anxiety disorders, depression, ADHD, and sleep disorders.

A subset of Thai adolescents enrolling in military cadet training are subject to particular stressors that require special attention. Transitioning from civilian life to the rigorous discipline of military training affects these individuals' emotional and behavioral well-being. Studies conducted among Armed Forces Academies Preparatory School (AFAPS) in Thailand have revealed that 5.3% of 528 adolescent students in AFAPS experienced low mental health levels. Furthermore, 6.8% of these students presented with low levels of resilience.⁽⁴⁾ The study unveiled that stress correlates were younger age, first-year student status, parental conflict, physical ailments, sleep disturbances, academic challenges, and

peer conflicts. Additionally, this study raised concerns about mental health problem intervention.⁽⁴⁾ The military society in Thailand still lacks awareness of mental health issues. Only 50% of the military population accesses mental health services. Besides the inadequacy of mental health literacy, negative attitudes toward mental health problems occur.⁽⁵⁻⁷⁾

The mental health challenges faced by adolescents have been exacerbated by the combined effects of the COVID-19 pandemic and life stressors, particularly in vulnerable populations. This rising concern highlights the need for effective intervention. One such intervention is PFA, a non-degree skill many use daily. PFA is an evidence-based approach to help individuals experiencing emotional distress.⁽⁸⁾ It provides tools and strategies to manage painful emotions and responses to high stress by addressing basic physical needs, offering a comforting presence, empowering individuals to use their strengths, and encouraging existing coping skills. The core of PFA by the World Health Organization (WHO) involves three basic steps: look, listen, and link.⁽⁹⁾

The WHO offers PFA as a guide for helping individuals following serious crisis events. PFA involves supportive and practical assistance for individuals who are distressed while respecting the individual's dignity and abilities. This approach could be adapted to support vulnerable groups and promote positive attitudes toward mental health issues, reducing the gap between needs and services.⁽⁸⁾ Previous studies have examined various PFA models commonly used in training, such as the Psychological First Aid Guide for Field Workers, the Psychological First Aid: Field Operations Guide, and the Johns Hopkins Guide to Psychological First Aid. Training methods for these models vary and can include didactic lectures, simulations, role plays, or a combination of these approaches. The duration of the training ranges from 90 minutes to 6 days.⁽⁸⁾ Recent research indicates that simulation games may effectively teach PFA.⁽¹⁰⁾

A game-based approach has been used in various fields, such as economics, education, industry, and health.⁽¹¹⁻¹⁴⁾ In serious game design theory, game elements are categorized into

three main types: components, mechanics, and dynamics.⁽¹⁵⁾ Game components include the materials and tools used in a game, such as visual, auditory, and tactile elements. Strong aesthetic components in the game, like sensation and narrative, improve the player's experience.⁽¹⁶⁾ Game mechanics refer to the rules that govern player behavior, challenges, and win conditions.⁽¹⁷⁾ The relationship between learning and game mechanics has been mapped for serious game analysis, demonstrating how gameplay connects with teaching and learning processes.⁽¹⁸⁾ Game dynamics encompass the internal drives of players, including engagement, motivation, and social interactions. Intrinsic motivation is essential for effective learning and personal development. According to self-determination theory, our most genuine actions stem from intrinsic motivation, which satisfies three key psychological needs: competence, autonomy, and relatedness. Competence involves mastering tasks and acquiring new skills, which drives people to act and achieve their goals. Autonomy refers to the sense of control and the ability to make choices that bring about change. Relatedness is the feeling of belonging and connection with others⁽¹⁹⁾. Games provide a practical example of how these needs are met. By offering goal-oriented challenges, structured rules, and opportunities for decision-making, games help players acquire new knowledge and skills while fostering community involvement. This engagement not only keeps learners interested but also supports their overall well-being. Research supports the idea that applying self-determination theory is a practical approach to designing game rules and features.⁽²⁰⁾ Gameplay helps users learn through experiences, promotes problem-solving and social skills, reduces the pressure of information loading, and provides enjoyment and entertainment while playing.⁽²¹⁻²²⁾ This positive engagement suggests that game-based learning can fit special adolescent populations.⁽²³⁾ Utilizing technology through applications could enhance learning efficacy and provide valuable feedback.⁽²⁴⁻²⁵⁾

This study aimed to develop an application-assisted board game for PFA learning among pre-cadets and evaluate its feasibility through pre- and postintervention self-assessment competency

tests and overall satisfaction. The secondary outcome involves assessing their perspectives on mental health issues and perceptions of the intervention after gameplay.

Methods

LuXid Dream: A PFA application-assisted board game

"LuXid Dream" was conceived as a collaborative tabletop game with assistance from a web-based application. The game was designed for 4-8 players and lasted around 45 minutes. The game's scenario includes chaos, multi-tasking, immediate problem-solving, and rapid communication. The website www.luxiddreampfa.com is a helpful tool that guides players through gameplay setup, provides rules, and offers support on PFA concepts. Players engage in collaborative play alongside the application, integrating PFA skills into gameplay, with the application responding accordingly.

Additionally, the application compiles gameplay data to provide feedback to the players. The game has two main components: the tabletop board and the application. "LuXid Dream" was designed for independent play, eliminating the need for a game master to explain the rules. This approach ensures that the game can be played at any time without lengthy preparation, which is often required for traditional board games. Additionally, independent play makes the game more accessible to learners who may not have prior board game experience.

Game components

The board, designed by the author, features 16 nightmares representing common negative emotions (such as anger, sadness, panic, and anxiety), two sets of 24 skill cards based on PFA principles (look, listen, link), 20 stabilizers to calm nightmares, eight tokens and player cards (for up to eight players), and five dice for each player (**Figure 1**). In designing the game's aesthetics, we crafted a storyline where players become a team of dream travelers journeying into the dreamer's nightmares. Their mission is to combat a mythical illness known as the "Luxid Dream" by bringing stability and calmness. To enhance this experience, we incorporated vibrant digital illustrations into the design.



Figure 1 *LuXid dream* table boardgame components

Under the supervision of Assistant Professor Dr. Chutima Prasartkaew, an expert in technology integration and innovation, students from Rajamangala University of Technology Thanyaburi (RMUTT) developed the web-based application. Players can create rooms and invite others to join for collaborative gameplay (**Figure 2**). The application guides players through game rules, presenting pop-up information about upcoming actions

Game mechanics

In the game mechanics (**Figure 3**), there are 4 to 5 rounds for each difficulty level, each with a time limit. Each round consists of three phases: strategy, dream, and cleanup. During the strategy phase, players discuss and plan their actions to stabilize nightmares using matching PFA skill cards. Players can coordinate their actions through collaborative efforts. In the dream phase, actions are determined by rolling dice, enabling them to relocate tokens, modify skill cards, draw fresh skill cards from a stack, or employ corresponding PFA skills. The used skill cards are then entered into the application, generating a response and creating a new stabilizer that helps players stabilize the nightmares (**Figure 2**). During the

cleanup phase, players can analyze how they used PFA skills to change turbulent emotions into states of calmness by looking at how the application gathered and summarized data from skill cards. The game concludes with either all players winning or losing together.

Game dynamics

As players engage with the game, they learn PFA concepts based on the Psychological First Aid: Facilitator's Manual for Orienting Field Workers.⁽⁹⁾ Players acquire insight into the timing and application of the 'look-listen-link' PFA skills in real-life scenarios via aligning skills with adverse emotional states. The "look" skill is practiced by observing the game board and other players' actions to identify the closest person or relevant skills. The "listen" skill is developed by paying close attention to the needs of other players. Conversely, the "link" skill is applied by viewing psychological crises as holistic, involving multiple emotions and needs and fostering connections among players. According to self-termination theory, the game mechanics promote competence, autonomy, and relatedness, strengthening intrinsic motivation.

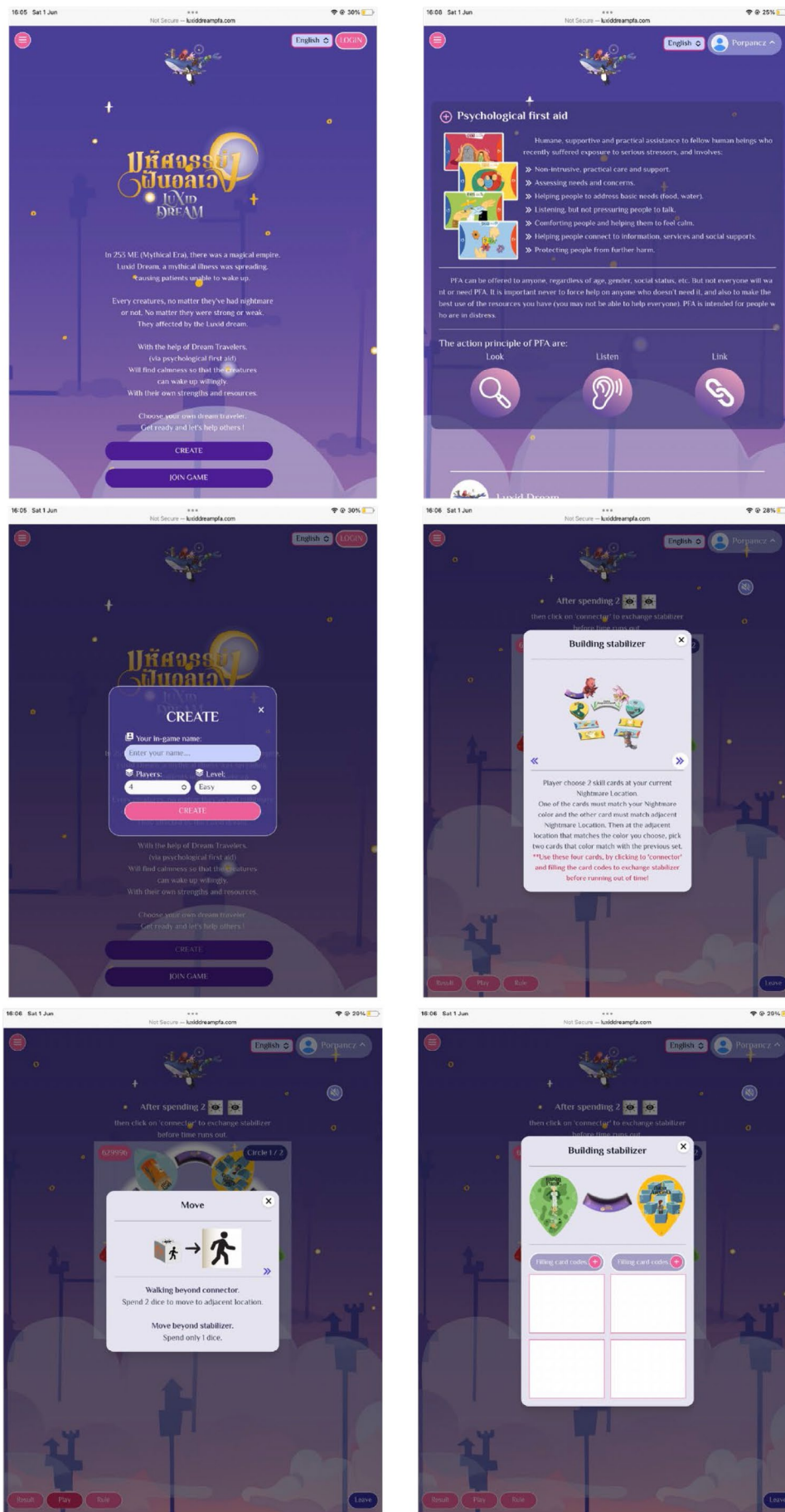


Figure 2 LuXid dream web-based application. www.luxiddreampfa.com

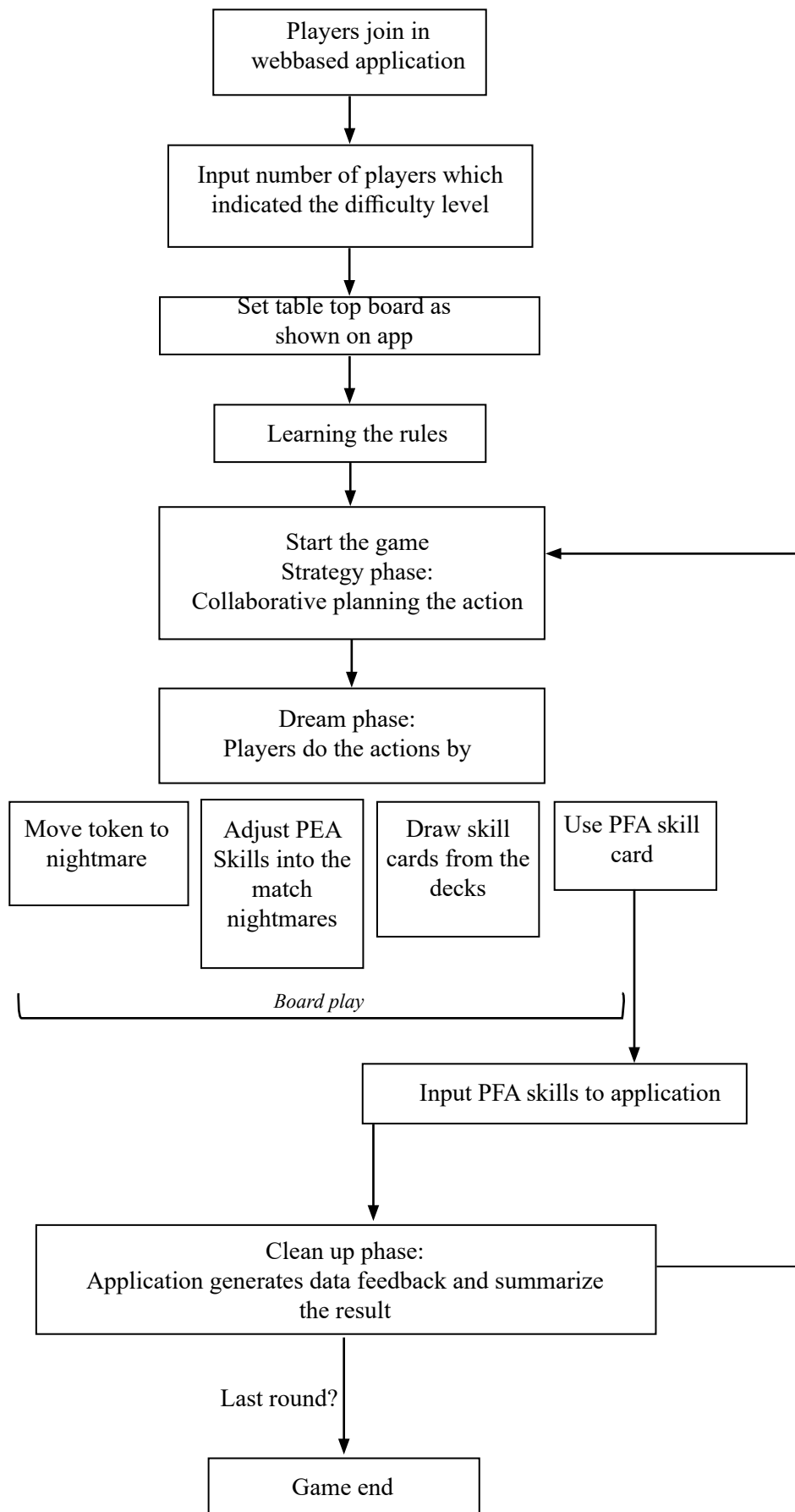


Figure 3 LuXid dream game mechanics

Research design

This study employed a pre- and post-experimental design to examine feasibility. After gameplay, participants' perspectives on mental health issues and their perceptions of an educational application-assisted board game for PFA learning were assessed through open-ended questionnaires.

The study took place in a Thai Armed Forces Academies Preparatory School in May 2024. On February 7, 2024, the Institute Review Board of the Royal Thai Army Medical Department (IRB-TA) approved this research, with reference number R191h/66.

Research participants

The game was played by pre-cadets (ages 16 to 18) who expressed their interest in playing. Those with severe mental illness or incomplete research forms were excluded. A total sample of 50 pre-cadets responded to participate in the study. Consent forms were obtained from both the students and their parents before participation. All participants were asked to play the game in groups of five, with the freedom to form their groups, fostering positive relationships within each group. Participants were assigned to read the storyline, which contained the objectives and an overview of PFA. After completing the orientation, they began gameplay while researchers watched over them to assist with app usage and navigation without interfering with the learning content.

Outcome assessments

To gauge the participants' confidence in their ability to apply PFA techniques, they performed competency tests before and after the exercise. Following PFA, the assessments were nine self-evaluation inquiries regarding PFA pre and post-test: Facilitator's Manual for Orienting Field Workers from the World Health Organization (WHO).⁽⁹⁾ Before gameplay, it was ensured that no pre-cadets possessed prior PFA training, guaranteeing that the game exclusively shaped their performance scores.

Following gameplay, participants rated their satisfaction with the experience. Using a 5-point

Likert scale, where '1' means 'totally disagree' and '5' means 'totally agree,' they assessed the 'perceived usefulness' (7 questions), 'perceived ease of use' (7 questions), and 'perceived enjoyment' (7 questions) of the game. This questionnaire was based on the technology acceptance model,⁽²⁶⁾ which included perceived usefulness and ease of use, and was extended to assess perceived enjoyment as an entertaining aspect.⁽²⁷⁻²⁸⁾ According to this model, perceived usefulness and ease of use are strongly linked to how often people use a system⁽²⁶⁾. Players' level of engagement with game-based learning can be determined by evaluating their level of enjoyment. Enjoyable elements are known to improve learning attitudes and foster a positive environment for social interaction.⁽²⁹⁾ The technology-acceptance model has also been widely adapted to evaluate game-based approaches.⁽³⁰⁻³¹⁾

Three child and adolescent psychiatry experts evaluated the satisfaction questionnaires' content validity, including two staff members from the Psychiatry and Neurology Department at Phramongkutklao Hospital and one from the Medical Office of the Support Service Department in the Thai Army. The reliability of the questionnaire was assessed using Cronbach's alpha, which resulted in a score of 0.88. Additionally, open-ended questions were used to elicit viewpoints on mental health concerns, observations on the educational process, and a discussion of the game's advantages and disadvantages.

Data analyses

We analyzed the data using SPSS software (version 23, IBM Corp., New York). Paired t-tests were conducted to assess PFA self-evaluation competency before and after the intervention, with the significance level set at $p < 0.05$. The responses to the satisfaction questionnaire were presented as mean (\pm standard deviation) and frequency (percentage). Qualitative data were analyzed to identify themes related to perspectives on mental health issues and areas requiring enhancement for learning through the application-assisted board game.

Results

Research participants

In this study, fifty first-year pre-cadets volunteered to learn PFA through an application-assisted board game, while the remaining pre-cadets received PFA training via a lecture in a conference hall. Fifty participants completed pre- and postintervention questionnaires. The average age of participants was 16.9 years ($n=50$), of which 28% were 16 years old, 52% were 17, and 20% were 18. Eight percent had been diagnosed with psychiatric conditions and received treatment, though none had severe mental illnesses. None had prior training in PFA. Each group of five pre-cadets was given an easy-level gaming challenge to complete; the game was won by only one group.

Self-assessment competency test

Overall, the findings revealed an increase in participants' self-evaluated scores, rising from 3.60 (± 0.64) to 3.89 (± 0.57) ($p < 0.05$). Significant

improvements were observed across all items except one: 'listening effectively within a cultural context.' Additionally, there was no change in the pre-and postintervention scores for 'Identifying distressed individuals in need of support.' **Table 1** shows the pre-and postintervention scores for each item.

Perception of satisfaction

The satisfaction survey results using a 5-point scale indicate a positive perception of the "LuXid Dream," particularly regarding perceived usefulness, ease of use, and enjoyment. Among these factors, perceived enjoyment received the highest rating, with an average score of 4.56 (± 1.2). Perceived usefulness ranked second, with an average score of 4.17 (± 0.89). With an average score of 3.9 (± 0.47), perceived ease of use garnered the lowest rating—yet it was still good. **Table 2** presents the frequency of satisfaction for each question along with the mean Likert score (SD).

Table 1. Paired t-test ($n=50$) of pre- and postintervention self-assessment competency.

Question	Mean (SD.)		Mean gain	p-value
	Before	After		
Supporting individuals who have undergone disasters or highly stressful events	3.28 (0.93)	3.72 (0.83)	0.44	0.01
Safely approaching crises	3.58 (0.76)	3.92 (0.75)	0.34	0.01
Acknowledging those in distress who require assistance	3.74 (0.88)	3.74 (0.85)	0	NA.
Knowing appropriate actions and responses to assist those in distress	3.36 (1.03)	3.78 (0.79)	0.42	0.01
Listening effectively within cultural contexts	3.68 (0.94)	3.88 (0.85)	0.20	0.07
Connecting affected individuals with necessary services and support networks	3.68 (0.96)	3.82 (0.90)	0.14	0.01
Recognizing and aiding those requiring special attention	3.46 (0.99)	3.92 (0.80)	0.46	0.01
Understanding what actions to avoid to prevent further harm	3.90 (0.95)	4.16(0.74)	0.26	0.01
Maintaining personal well-being while assisting others in crises	3.74 (0.92)	4.12 (0.77)	0.38	0.01
A total 9-item self-evaluation	3.60 (0.64)	3.89 (0.58)	0.29	0.01

NA: not available

Table 2. Scores for satisfaction n (%)

Items	Totally disagree (1)	Disagree (2)	Neither (3)	Agree (4)	Totally agree (5)	Likert score mean (S.D.)
Perceived usefulness						
Using a gaming system helps make the content easier to understand	0 (0%)	3 (6%)	11 (22%)	20 (40%)	16 (32%)	3.98 (0.89)
Games provide an overview of PFA	0 (0%)	1 (2%)	11 (22%)	15 (30%)	23 (46%)	4.20 (0.86)
The gaming system helps in understanding the workflow sequence	0 (0%)	1(2%)	9 (18%)	23 (46%)	17 (34%)	4.12 (0.78)
Using a gaming system can connect knowledge to real-life situations	0 (0%)	3 (6%)	13 (26%)	17 (34%)	17 (34%)	3.96 (0.92)
Games can stimulate systematic thinking	0 (0%)	0 (0%)	4 (8%)	18 (36%)	28 (56%)	4.48 (0.65)
Games address learning needs effectively	0 (0%)	3 (6%)	7 (14%)	18 (36%)	22 (44%)	4.18 (0.90)
A gaming system can help summarize learning	0 (0%)	1 (2%)	5 (10%)	22 (44%)	22 (44%)	4.17 (0.59)
Perceived ease of use						
The gaming system is easy to use	3(6%)	15 (30%)	16 (32%)	10 (20%)	6 (12%)	3.02 (1.11)
The game is simple to use and understand	0(0%)	8 (16%)	19 (38%)	15 (30%)	8 (16%)	3.44 (0.97)
The duration of the game is appropriate	1(2%)	10 (20%)	19 (38%)	7 (14%)	13 (26%)	3.42 (1.14)
The game’s elements are consistent with the content	0(0%)	0 (0%)	7 (14%)	16 (32%)	27 (54%)	4.40 (0.73)
The system runs smoothly without interruptions and is logical	0 (0%)	1 (2%)	11 (22%)	16 (32%)	22 (44%)	4.18 (0.85)
The design is appropriate, including elements like images, colors, and sizes	0 (0%)	0 (0%)	4 (8%)	11 (22%)	35 (70%)	4.62 (0.64)
The application’s functionality is easy to understand	0 (0%)	3 (6%)	9 (18%)	11 (22%)	27 (54%)	4.24 (0.96)
Perceived enjoyment						
The gaming environment is enjoyable	0(0%)	1 (2%)	3 (6%)	18 (36%)	28 (56%)	4.46 (0.71)
Playing games helps develop social skills	0(0%)	1 (2%)	3 (6%)	14 (28%)	32 (64%)	4.54 (0.71)
The game system creates a sense of challenge and encourages continued play	0(0%)	2 (2%)	7 (14%)	14 (28%)	27 (54%)	4.32 (0.87)
Games increase engagement in learning	0 (0%)	2 (4%)	7 (14%)	15 (30%)	26 (52%)	4.30 (0.86)
Games help reduce learning pressure	1 (2%)	0 (0%)	8 (16%)	11 (22%)	30 (60%)	4.40 (0.88)
Playing games helps strengthen relationships with others	0 (0%)	0 (0%)	0 (0%)	15 (30%)	35 (70%)	4.70 (0.46)
I want to recommend the game to my friends	1 (2%)	2 (2%)	8 (16%)	11 (22%)	28 (56%)	4.26 (1.00)

Reflection on learning PFA through the application-assisted board game

Two main aspects of the participant answers were evaluated: alterations in their perceptions regarding mental health issues following gameplay and pinpointed areas requiring refinement for the future advancement of the application-assisted board game. Those who learned through gameplay (n=17) observed that “LuXid Dream” effectively raised awareness of mental health and its significance:

Taking care of our mental health is important

because when our mind is not well, it can affect our physical health (ID35).

Some participants (n=10) noted that generalizing mental health issues contributed to reducing the stigma surrounding mental health problems within military society:

Anyone can experience a mental crisis. It's important to talk to others about it instead of keeping it to ourselves (ID47).

Participants (n=13) reported that while playing “LuXid Dream, “ they became more aware of their emotions and learned coping skills from the game’s content:

I noticed that some of the emotions in the game match my inner thoughts, and using PFA skills can be helpful (ID13).

Regarding areas for improvement in the game’s development, participants (n=33) mentioned that the rules were complex and should be revised:

The game’s rules can be complex and too complicated for beginners (ID26).

Some participants (n=13) suggested that the user interface design should be redesigned to improve its usability:

The user interface size (UI) does not match the device’s screen, and entering data is inconvenient (ID49).

Discussion

Our game design conveys the concepts of PFA from the WHO’s Guide for Field Workers.

This guide intentionally uses simple language to make it adaptable for various cultural settings, especially in low- and middle-income countries.⁽⁸⁾ PFA was chosen as the primary model for mental health literacy because it emphasized immediate psychological care, which suited the studied population, as indicated by previous research on mental health problems among adolescent students in Thai Armed Forces Academies Preparatory School.⁽⁴⁾

Our study suggests that learning PFA through the “LuXid Dream” game is feasible. The self-assessment competency test demonstrated a substantial overall enhancement in scores, reflecting improved abilities in recognizing individuals in distress, providing support, handling situations safely, understanding appropriate responses, linking individuals to necessary services, taking proactive steps to prevent harm, and preserving personal well-being. Participants could master these PFA talents while using the skill cards to stabilize each nightmare. After utilizing a card, the application required data entry and immediately gave feedback on whether the skill matched the nightmare. This feedback was designed to help players learn PFA skills effectively. The instant feedback allowed players to understand their mistakes and improve, reinforcing the learning process. In the cleanup phase, the application reported the cards used, allowing players to review and relearn after the round ended. This interactive gameplay could enhance knowledge retention. Previous studies have shown that game-based learning positively impacted meaningful learning, knowledge retention, decision-making, and critical thinking.⁽³²⁾ The lack of significant improvement in listening effectively within cultural contexts might be due to the “LuXid Dream” storyline focusing more on emotional states than cultural contexts. Future development of the “LuXid Dream” could emphasize how PFA skills apply to various social situations, aligning with one of the objectives of WHO’s PFA guide.⁽⁹⁾

Furthermore, overall satisfaction scores generally fell within the “agree” range for perceived usefulness, ease of use, and enjoyment. Over 70% of participants rated each item between “agree”

and “totally agree,” except for three items related to ease of use. For the items “game system is easy to use,” “game is simple to use and understand,” and “duration of the game is appropriate,” 30-40% of participants rated them from “agree” to “totally disagree.” Some participants disapproved of the time and stated that the rules and game system were complex. This feedback should be seriously considered in future development. Recent studies suggest learners and educators prefer games with lower complexity and shorter durations. However, no clear standard exists for ensuring and demonstrating content accuracy.⁽³³⁾

The perception of usefulness and ease of use can predict the likelihood of individuals adopting technology, as the Technology Acceptance Model suggests.⁽²⁶⁾ These factors determine whether people will accept and utilize new technology⁽³⁴⁻³⁵⁾. Additionally, enjoyment of the game positively impacts attitudes toward learning, consistent with previous research that links perceived enjoyment with a positive attitude.⁽²⁸⁻²⁹⁾ According to previous studies, playing games as a learning tool has proven effective and enjoyable. Students engaging in gaming activities benefit from physical, social, and cognitive experiences, which enhance their learning process. These experiences contribute to positive feelings, increased motivation, and active participation in learning.⁽²²⁻²³⁾ This finding highlights an opportunity to explore new methods for teaching PFA.

In “LuXid Dream,” the game’s design reflects the principles of Self-Determination Theory (SDT) by offering players a range of gameplay choices that promote autonomy. Players can engage in divergent actions simultaneously, which leads to different outcomes as they strive to achieve their mission. During the strategy phase, players exercise autonomy by discussing and selecting the outcomes they want to pursue. Completing tasks enhances their sense of competence, as they are rewarded with resilience-themed items, contributing to a sense of accomplishment and developing new skills. The game’s cooperative aspect also supports the need for relatedness, encouraging players to communicate and

collaborate. This study took place during the first week of the school term, allowing participants—previously unfamiliar and from different regions—to interact and form connections. Games that cater to the psychological needs of autonomy, competence, and relatedness tend to foster intrinsic motivation and improve player retention, as these needs are crucial for sustained engagement.⁽¹⁹⁾

Mental health literacy involves understanding and attitudes related to mental health issues, which are vital in recognizing, preventing, and managing them.⁽³⁶⁾ This encompasses identifying specific disorders, locating mental health resources, grasping risk factors and causes, being informed about self-care options, comprehending available professional support, and maintaining attitudes that encourage recognizing issues and seeking appropriate assistance.⁽³⁷⁾ Our study found that “LuXid Dream” could enhance mental health literacy by targeting critical areas of understanding, including knowledge of risk factors, causes, and self-treatment. This was evident in participants’ reflections after gameplay, where playing “LuXid Dream” increased awareness of mental health issues, highlighted the importance of recognizing these issues in themselves, and fostered the perception that mental health challenges were a shared experience. Additionally, it equipped participants with skills to manage mental health problems. Knowledge and positive attitudes toward mental illness are crucial, as they encourage individuals to seek help and openly discuss their mental health concerns.⁽³⁸⁾

Participants raised concerns about the complexity of the “LuXid Dream” gameplay rules and the application’s user interface design for future improvements. As previously mentioned, future development of “LuXid Dream” should focus on simplifying the game rules while maintaining the accuracy of PFA concepts. According to flow theory, the gameplay should also aim to balance the challenge level with the player’s skills, creating an optimal learning environment that keeps players engaged and focused.⁽³⁹⁾

One of the study’s strongest points is its ability to teach PFA skills through gameplay; it depicts a novel and captivating mode of instruction that

goes beyond conventional approaches. Another notable point is the absence of clear instructions on how PFA training is implemented or adjusted to different situations.⁽⁸⁾ This study could pave the way for a novel method of PFA learning and serve as a potential model for enhancing mental health literacy among adolescents. Nevertheless, one significant drawback is the intricacy of the game's rules, which could take a long time to comprehend and possibly lessen the learning value. This aspect should be carefully considered in future research efforts.

Conclusion

The study revealed that employing an application-assisted board game called "LuXid Dream" for PFA learning was feasible. This method can elevate awareness of mental health issues among pre-cadet students, foster motivation for learning, demonstrate the practical application of PFA skills, and facilitate comprehension of PFA concepts among pre-cadets. Moreover, this study can introduce a new way of learning PFA and become a model for improving mental health understanding among teenagers.

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Conflict of interest

The authors declare they have no conflicts of interest.

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