SOCIAL SCIENCES & HUMANITIES

Design and Application of a Legal Game to Promote Factual Investigation Knowledge for Undergraduate Law Students

Chainarong Luengvilai*, Noppon Wongta and Pitipong Yodmongkol

College of Arts, Media and Technology, Chiang Mai University, Chiang Mai, 50200 Thailand

ABSTRACT

This study presents a successful example of experimenting with proper step-by-step guidance on how, when and why to conduct factual investigations by introducing new learning tools to a group of law students, such as this set of computer-based games. Deploying the games as an extension of traditional law learning, this paper synthesizes complex tacit knowledge from legal experts, adopting the cognitive learning theory of Bloom's Taxonomy, to create serious games as new learning approaches. Students' learning revealed satisfactory achievement in enhancing the body of fact-finding knowledge and engagement. The gaming has potential in advancing practical knowledge of fact investigation for mass utilization, reducing traditional learning obstacles of a Thai law school, while minimizing the gap between existing educational approaches and students' future professional practices.

Keywords: Cognitive learning, factual investigation, knowledge management, law of evidence, lawyering skill, legal education, serious game

INTRODUCTION

Legal experts unanimously agree that factual investigation is an essential fundamental lawyering skill (American-Bar-Association, 1992; Luengvilai & Yodmongkol, 2011; Sattayutchamnan, 1939/2019; Waincymer, 2010). It is the first mission before any practicing lawyer shall provide any further legal action or legal advice. Without the skills, genuine truth and proper counselor judgment can rarely succeed. One reason for case dismissal by the courts in Thailand is

an inadequate factual investigation process (Office of the Attorney General of Thailand, 1996; *Sherry Ann Duncan*, 1999; "Thai Supreme Court ordered", 2003). As a result, innocent lay people may get involved with unfair accusations caused by the insufficient presentation of truth. For example, in one criminal case, the defendants maintained their innocence and appealed the verdict. Three years later, the Supreme Court acquitted all four men and ordered their release. It was too late: one defendant died while in custody, two others became seriously ill, and one of them died soon after his release. No compensation was legally available to them or their families for this miscarriage of justice. In 2001, Thailand for the first time introduced new legislation to compensate wrongfully accused people who suffered harm as the result of the criminal justice process. During 2009–2013, the Thai government compensated over 300 innocent persons, spending more than 50 million baht (Thailand Ministry of Justice, 2015).

Law schools in Western countries (Becker, 2001; Binder & Bergman, 2003; Binder et al., 2007; Bock et al., 2009; Boon & Webb, 2008; Brest, 1995; Cantroll, 1952; Irish, 2006; Maxeiner & Yamanaka, 2004; McClain, 1953) and even some advanced Eastern civil law countries, such as Japan, Taiwan, and South Korea (Pohjonen & Lindblom-Ylänne, 2002; Post, 2009; Wang, 2009; Wilson, 2010), have been studying, discussing and identifying fundamental lawyering skills, including fact-finding, and initiating skill transferring approaches in their law school's curriculums for years to prepare their law students to be competent novice lawyers in order to serve the law, society and protect the public interest.

Thai legal educators have only recently realized the needs of lawyering skills-based learning to achieve justice system reform, but the challenges regarding the vision and strategies remain unresolved (Public Law Net, 2017; Thailand Development Research Institute, 2015). The argument for the need for legal education reform to promote factual investigation skills of the Thai undergraduate law programs is based on two reasons. Firstly, the Thai Bar Education and National Lawyer License Training Program are supposed to be the higher legal profession training programs after the undergraduate law degree. In fact, they are not compulsory education for law career paths except the mainstream law careers: judges, public prosecutors, and litigating lawyers (Act on Judicial Administration of the Courts of Justice B.E. 2543[A.D. 2000]; Act on Public Prosecution Administration of the Public Prosecution B.E. 2553 [A.D.2010]; Thailand Lawyers Act 1985) and they do promote factual investigation skills learning. The Thai Bar Professional Training Course offers one year to acquire a higher level of substantive legal knowledge by means of the lecturing method. The exit examination applies the same pattern of legal case analysis essays as the undergraduate law program (Thai Bar Under The Royal Patronage, 1964). The students are not required to discover or prove any truth before any legal case analysis is delivered in the essay exams.

Neither a one year National Lawyer License Training Program nor a full internship in a recognized law firm program are sufficient on litigation skills training due to the meager design of the fact finding skill-based curriculum (Sathitsuksomboon, 2015). As a result, any law graduates who have achieved the two non-compulsory programs and entered into the legal practicing arena may still lack factual investigation knowledge or skill, as it was not the key focus of the programs. Secondly, the emergence of new legal missions and career paths under the Thai Constitution, for instance, the National Human Rights Commission of Thailand, the Consumer Protection Board of Thailand. Lawyers of Provincial Administrative Organizations, or lawyers of Non-Governmental Organizations; Foundation for Consumers. Thus, social changes have widened an opportunity for undergraduates to practice law without both the Thai Bar certificate and lawyers' license since 1997. The new in-house lawyers definitely are involved in gathering facts before making any official decision under their authority which ultimately impacts on people's legal rights.

Therefore, the undergraduate law program is the only compulsory legal education for Thai lawyers and should provide factual investigation skills learning opportunities at an appropriate level as possible to their law students before they enter and practice in the legal arena. However, a survey of Chiang Mai University's law school curriculum, which apparently shares common curriculum characteristics and a learning approach with other law schools in Thailand (Tipmanee, 2011), as an example, revealed that almost half of the 148 senior and recently graduated law students (47.5% and 44.1%, respectively) lack self-confidence in their fact-finding skills (Luengvilai & Yodmongkol, 2011). Due to most law schools focusing their curriculum on comprehensive legal knowledge in civil law to provide a thorough body of the core substantive legislation, including specific terms, reasoning of laws, analysis of legal cases and application of laws at work. As a result, a large part of the examinations deals overwhelmingly with legal case analyses drawn from settled case facts, while in real-life legal practice, lawyers have to begin a case by gathering all related facts. Besides, the initial survey found that general law schools make less effort to encourage students to possess factual investigation skills for actual legal cases (Luengvilai & Yodmongkol, 2012). Available courses for skills training are not adequate to equip students with basic investigation techniques (Luengvilai & Yodmongkol, 2016).

However, some other particular current circumstances of Thai law schools prohibit effective promotion of factual investigation skills learning opportunities to law students in mass but the possible solutions are time-consuming and have inconsistent outcomes. For instance, young age and inexperience of the law students raise the question of designing an effective learning approach other than the traditional lecture-based model. A lack of experienced law professors accustomed to teaching lawyering skills

has resulted in the law schools inviting outside legal experts as guest lecturers. Notwithstanding that a new innovative teaching model operating in parallel with a traditional lecture method can yield inconsistent outcomes, defensive routine behavior or lack of motivation may also be expected (Argyris, 1976; Ashforth & Lee, 1990; Biljana & Dragana, 2017). In fact, guest lecturers who have training skills are difficult to find and, perhaps, too busy to deliver a full training course in a particular class schedule. Furthermore, the plan to provide additional compulsory fact-finding skill courses under the law program might need curriculum revision due to current total course-credits which have to a reach maximum requirement.

Based on the potential of knowledge sharing concepts in an innovative learning approach (Andolšek & Andolšek, 2015), students' learning can be maximized through a knowledge spiral process, adopting innovative learning tools from the community of practice that gradually integrates into the professional legal work arena. The concept of the spiral process has been developed in the works of Ikujiro Nonaka and Hirotaka Takeuchi (Takeuchi & Nonaka, 2000). Its main idea is that the process of acquiring any knowledge, including legal knowledge, has four dimensions – socialization, externalization, combination, and internalization. The knowledge is created by a 'spiral' passing through all these dimensions. This paper will develop this concept in application

to legal knowledge. The problem with the contemporary state of Thai legal education is that it does not permit in its present form the application of this innovative approach. There is a need to change the traditional methods of law teaching. A change does not to be immediate and dramatic. Practically, the legal experts can be invited to stimulate insight discussion with law students during learning activity which, as a result, not only enhances shared experiences but also eliminates the burden of extra classes, cost management and is user-friendly for any busy guest lecturer who believes in the power of knowledge sharing.

Applying the modern concept of active learning and new technology can effectively transfer knowledge and promote a better engagement to a mass cohort and young generation of law students (Biljana & Dragana, 2017). In this research paper, learning by interactive games will be examined to present an alternative way to advance an innovative learning approach based on the concept of spiral process of acquiring knowledge. The methodological aspects of an interactive learning game are described in the following section.

METHODS

Structuring Knowledge Concerning Factual Investigation Skills

This study consisted of the following two crucial steps based on knowledge management concepts, specifically knowledge-capturing methods as a guiding methodology.

The First Step was Identification of Qualified Legal Experts to Demonstrate Intensive Interviewing. Two official communities of practical lawyers and a well-known lawyer of Thailand agreed for one-on-one in-depth interviews, including the President of the Law Society of the Lawyers' Council of Thailand, the general attorney at law, and a well-known lawyer, who had both strong legal academic and practicing backgrounds. A snowball sampling method was used to reach a qualified informant referral (Atkinson & Flint, 2001; Browne, 2005; Sadler et al., 2010).

The Second Step was Structuring the Body of Factual Investigation Skills Knowledge from Interviewing Analysis. Upon the official invitation, all the volunteers identified legal experts who in the first step were encouraged to respond to a set of questions designed and articulated from the pilot interviewing of a legal expert (Luengvilai & Yodmongkol, 2012), who possessed ten years of experience in practical fact-finding skills in according with the "ten thousand hour rule" (Gladwell, 2008). The meaning of the rule is that to become a real expert at any branch of knowledge, one must accumulate ten thousand hours of practice in that particular area. In ordinary circumstances, that would require approximately ten years of practice. All the tacit and explicit knowledge of factual investigation from the concerned interviewees were transcribed, analysed, and synchronized as a single model.

Interactive Learning Game Design

The core concept of game design was not intended to create a performance evaluation tool but to encourage self-learning with concepts of high learning accessibility and promoting learning engagement for a mass and young generation of law students to acquire factual investigation skills with live client cases. In this study, game players utilized their critical thinking and learning through many challenges and other aspects of the game design, such as knowledge-transferring design and learning engagement, with fun in the design. Intentionally, the more the students have opportunities to play and learn the game, even with some mistakes, the more they acquire knowledge regarding fact-finding skills.

The designed learning approach is based on key conceptual ideas including familiarization, cognitive learning, feedback, and engagement. First, the introduction stage of the game is focused to familiarize players with the learning purposes and how to use the learning tool in brief.

Second, the cognitive learning stage allows the players to obtain knowledge of factual investigation skills as structured from the qualified-legal experts' views. This stage provides challenging questions from basic to advanced level. The objective design of the questioning was based on the cognitive learning theory of the so-called "Bloom's Taxonomy" which had been widely applied in designing examining objectives frameworks, classroom assessments design and other educational

aspects for decades (Cannon & Feinstein, 2014; Halawi et al., 2009; Kastberg, 2003). This taxonomy classifies educational learning objectives into levels of complexity and specificity. Its advantage is that it helps educators to focus better on the learning skills of students. Students are expected to gain the following learning outcomes: remembering, understanding, applying, analysing, evaluating, and creating a factual investigation (Anderson et al., 2001; Forehand, 2010).

The simulation stage focused on enhancing the player actively to exercise their higher-order thinking related to factual investigation skills as gained from the previous cognitive learning stage in identifying, criticizing, analyzing, evaluating, and solving the problem as considered in the simulation case. Moreover, missions, or challenges, were designed to stimulate young law students' critical thinking, curiosity, decision making in a legal case, and engagement to retain learning attention (Birzer, 2003; Knowles, 1970, 1978; Merriam, 2001).

As regards the learning tool platform selection, the serious game approach in its various forms, including computer-based games, has a potential for transferring serious knowledge or skills for specific purposes rather than entertainment (Andrews & Baber, 2009; Breuer & Bente, 2010; Kim et al., 2009; Michael & Chen, 2005; Susi et al., 2007; Yusoff et al., 2009). This serves interactive mass learning with timely feedback and high accessibility, and enhances possible function design to promote engagement. Therefore, a serious game concept, together with the cognitive learning theory of the so-called "Bloom's Taxonomy" and captured-knowledge, including an idea of the flow of logical decision-making in investigating facts by legal experts, were integrated as the core idea in designing an interactive learning tool instead of the lecture-based method which had been predominant in Thai law schools generating low learning retention rates (Day et al., 2004).

Third, the feedback aspect is another feature to enhance and clarify learning issues to all participants during the game, proceeding in a way where each stage provides meaningful feedback to the players for each decision and for overall stage performance. Lastly, learning engagement is built into each stage of the game, while incorporating curiosity and excitement for the participants to learn as many important legal concepts as possible.

EXPERIMENTAL DESIGN

The research aimed at discovering an innovative legal skill learning approach which would promote self-learning by the law students who were used to the passive learning of lecture-based classrooms. Although the experimental design explored the effectiveness of only the fact-finding game, the lecturing method was also evaluated in comparison for effectiveness in transferring knowledge and promoting learning engagement promotion to participants.

Voluntary Sampling (Cohen et al., 2013)

The voluntary participation theory was applied in this research sampling. The research specifically required voluntary senior law students who were committed to the experiment. Moreover, all volunteers must have never learned or experienced factual investigation skills to avoid distortion in the learning results. Lastly, Grade Point Average (GPA) of participants must also be proportionate between the 2 groups of 2.0-3.0 and more than 3.0. With the specified participant qualifications and time limit of the research, the sampling, therefore, comprised a total of 28 volunteer senior law students from Chiang Mai University, Thailand (Law CMU). The first 14 students, the so-called "G group", were encouraged to learn knowledge of factual investigation from the game as created in this research. The second 14 students, the so-called "L group", were encouraged to learn through the lecturing method the same knowledge of the factual investigation as provided in the game. Each group consists of 7 students with GPA 2.0 -3.0 and 7 students with GPA more than 3.0.

Procedures

The experiment, with full consent of the individual participants, consists of two stages of pre- and post-learning interviews and tested for comparison comparative analysis of the samples' cognitive knowledge development and learning engagement. Participants' behaviours during the observations and the interviewing might show a level of engagement in learning with pleasure as a result of fulfilling the purpose of the game design. Note that a pilot study was carried out before the final pre- and post-tests were set. Four law students completed the tests and were invited to comment on their language and content. Appropriate changes were made. Moreover, the pre-test was introduced to each sample after the pre-learning interviewing stage to avoid the samples' responses being influenced by the contents of the test. Lastly, samples were required to complete the post-test by the second day after the learning for both the game and lecture-based approach to avoid short term memory influence to the post-test results.

RESULTS

The study provided two essential results which were (1) the core knowledge of the factual investigation skills shared by the qualified-legal experts, which comprised the serious game elements, as well as (2) the analysis of the experiment that demonstrated the effectiveness of the serious game as a learning tool for acquiring factual investigation skills knowledge.

Knowledge Body of Factual Investigation Skills for Lawyers

Nine qualified legal experts with at least ten years of experience agreed with the proposed methodology, especially that factual investigation skills are a fundamental skill necessary for law students. They also admitted that sharing knowledge regarding fact-finding skills could advance the sense of social responsibility, and that this sharing

could create a value chain perspective, through senior lawyers to law students, who would finally become practicing lawyers in the future. The core process involved in the verified fact-finding skills were set forth briefly as follows:

Core Principle. The legal experts stated that effective fact-finding processes must strictly adhere to and be controlled by the following core principles: bias-free; avoid presumption or prediction as regards the truth; a well-rounded investigation was possible with facts coming before conclusions, and a scientific and arts approach integrated.

The summary of Factual Investigation Skill Task Process. To begin investigating fact(s) effectively, lawyers should understand the flow of thoughts as implemented by the legal experts. There were two core processes, quantitative and qualitative assessment, with eight sub-tasks concerning how to perform factual investigations for legal cases, as illustrated in the following Figure 1. In summary, the skill consisted of various complex tasks, for example, identification of the core conflict, identification of the law related to the core conflict, procurement of the required facts and evidence, validation of the credibility and reliability of all the
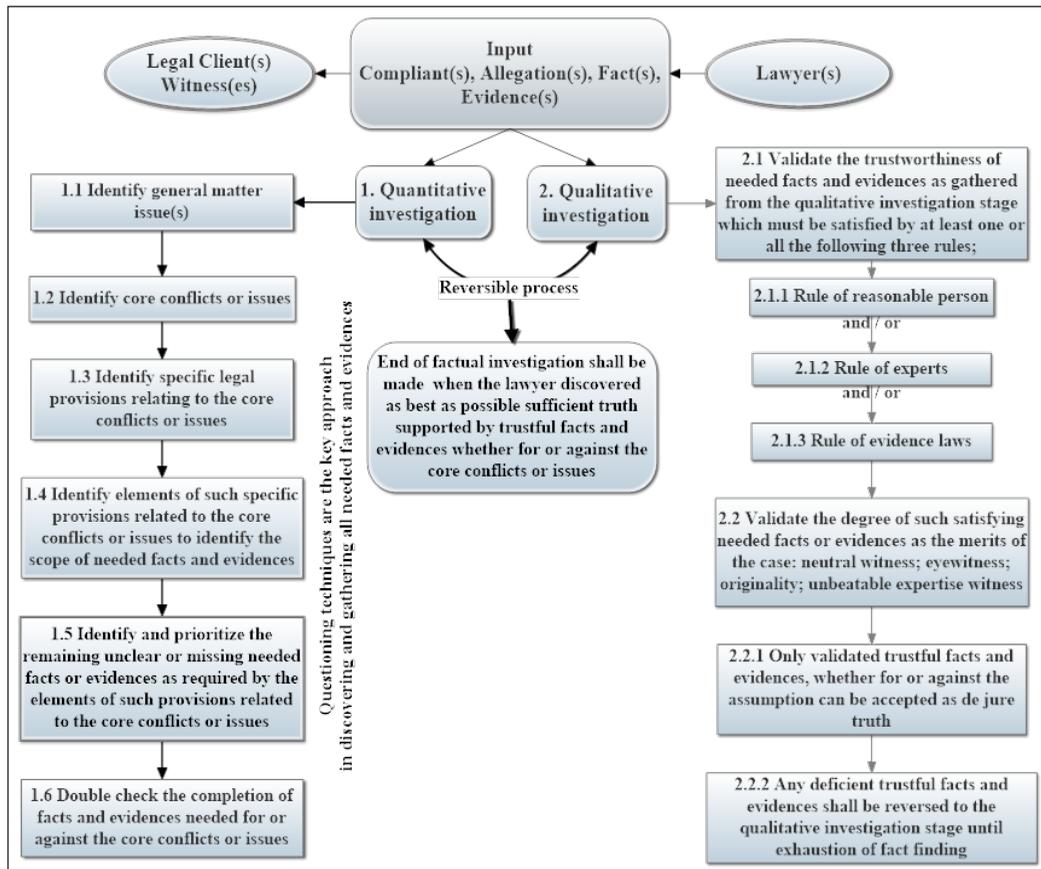

Figure 1. The task process of lawyering, involving factual investigation skills

required facts and evidence that have been gathered.

Game Elements

The game was divided into three stages of learning as follows.

Stage 1-2: Quick-quiz. Stage 1 is a question set regarding the meaning and relationship of "fact" and "truth" from the perspective of law and the principles of factual investigation skills. Stage 2 has a question set with an emphasis on proceeding step by step and including the techniques, tips and cases analysis related to factual investigation skills. All questions were structured from the legal experts' knowledge and defined learning purposes by the six higher order thinking concepts whichever of Bloom's Taxonomy. Achieving the equivalent of 70% or above of total scores for both Stage 1 and 2, unlocked Stage 3 for the player, as shown in Figure 2.

In term of game challenges, there are various and complex types of answering approaches. For example, the types are 1) Single choice selection, 2) Multi-choices set selection, 3) Multi-choices matching, 4) Reordering of multi-choices, 5) Selection plus reordering of the multi-choices, 6) Non-retrieval quiz style with a time-limit and 7) Rotatable multi-choices.

The player obtained additional knowledge details from a pop-up dialogue box for every correct answer, as shown in Figure 3. There were hints in either color or clue style to encourage critical thinking together with sound effects to make it fun to play as shown in Figure 4. Performance report at the end stage was given in percentage (%) form and higher order thinking of Bloom's Taxonomy for more meaningful player's feedback.

Stage 3: Case-based Mission. The game missions of Stage 3 are based on ideas of adult learning under andragogy theory (Birzer, 2003; Knowles, 1970) and from the flow chart of experts thoughts as shown in Figure 1. Andragogy theory is an attempt to develop an educational approach aiming at adults. There is a greater focus on the process of learning and less on the content. The player was encouraged within the constraint of information and time to provide analysis, critical thinking, identification and verification, as regards not only the possible specific legal provisions related to the case, but also as to what given facts were crucial and trustable based on the knowledge of legal experts, as they had just learnt from the Stage 1-2. The case started with a conversation between a lawyer (a player) and a lady client who was confronting the tragic death of her parents caused by a drunk driver. The player was given in total of two factual sets sequentially by the client. Her family members were not only angry with the driver but also apprehensived of the urgent funeral ceremony preparation and the parents' property management. The sudden tragic situation put a lot of pressure and confusion on her, as the oldest sister, regarding what and how to carry out the legal matters.

Mission 1: Identifying the General Issue and Possible Law Areas Related to the Client's Case. It is the lawyer's first reaction when conducting the factual investigation, to try to figure out some hints along with the client dialogue to determine the exact area of the law involved.

Mission 2: Verifying the Accuracy of Mission 1's Decision. The player is required to select any key sentences from the client's dialogue (Factual Set 1) which are considered to provide the issues involved in answering the questions in Mission 1. The player is to consider four from ten key sentences as giving the correct answers to the Mission.

Mission 3: Analysing what Fact Issues are Possibly Related to Legal Issue(s) in the Client's Case. In Factual Set 2, the client delivered more unstructured facts which revealed more clues, witnesses, documents, claims and arguments based on the client's thinking and feeling. Only a competent lawyer can possibly realize not only the relationship between them but also the core problems and specific law. According to Factual Set 2, the player is required to reconsider in details toward what four from eleven key sentences, taken from Factual Set 2 are considered to be useful for further legal analysis.

Mission 4: Verifying the Accuracy of Mission 3's Decision. The player is encouraged to explain more about why each selected key sentence in Mission 3 is interesting by matching each of them with any of possible seven choices in Mission 4.

Mission 5: Specifying Legal Area and Legal Provision(s) Related to the Core Issue of the Client. Based on all revealed facts, the player is encouraged to specify precisely the proper choices regarding the code of law, legal title, legal chapter and legal provision(s) related to the client's core issue from the four codes of laws: Civil & Commercial Code; Civil Procedural Code; Criminal Code and Criminal Procedural Code. The player is allowed to change the answers from Mission 1-2 at this Mission stage, if the player realized that he or she had made the wrong decisions based upon gaining more facts and evidences.

Mission 6: Generalizing the Core Fact Issues, Evidence Gap and Action Plan for Further Factual Investigation. The player is encouraged to identify any facts or evidence gap between the current situation and what was necessary, as required by elements of the specific legal provision(s). The Mission demands the player not only select but also prioritize the five, out of nine possible, key questions to gain new fact details related to the core issue. Improper choice selection prohibits the player from additional crucial facts or evidence. There was one key question among the possible choices which was the first priority for further investigation. Therefore, the player is rewarded with a useful hint if he or she selects such the key question as the first answering choice.

Mission 7: Finalizing the Client's Core Legal Problem. The Mission encourages the player to select one from seven possible keywords which best described the client's core legal problem. The player is rewarded with the elements of the specific legal provision(s) related to the client's core issue.

Mission 8-9: Identifying and Evaluating All Crucial Fact Issues as Required by Each Element of Specific Legal Provision(s) Related to the Core Issue. The task is self-reminding regarding how many fact issues and evidence are settled and how many are remaining for further fact finding. Mission 8-9 require the player to identify eight from possible thirteen fact issues and evaluate each of them by matching any of five possible symbols considered to apply in the situation as shown in Figure 5. Each symbol can refer to, for example, "The fact issue is crucial for the case but lacks clear fact details or evidence", or "The fact issue is crucial and settled in the details, but is currently awaiting supportive evidence", or "The fact issue is crucial and settled in both details and supportive evidence"

Mission 10: Evaluating the Trustworthiness of the Facts. Any gathered facts and evidence which are supposed to be true from a legal perspective must be satisfied at least by logical reasoning and the law of evidence, as suggested by the legal experts. In terms of litigation, the lawyer should, in addition, identify the best de jure trustful facts and evidence to benefit the lawyer in the preponderance stage. Therefore, the Mission requires the player to use critical thinking, not only to discover the final fact details and evidence from possible involved persons, but also, to evaluate the reliability of eight fact issues and related evidence by selecting the perfect choice as provided in the Mission.

Mission 11: Summarizing the Investigation. The last Mission encourages the player to reconfirm whether the whole situation and the factual investigation task has arrived at the proper conclusion or not, including the supportive reasons behind the conclusion. There are possible multiple choices for selection, either positive or negative answers.

Summary Performance Report. The player shall be informed in a timely manner in a performance report on two aspects after Missions 7 and 11, regarding the number of (1) re-clicking which implies hesitating or wavering decisions and (2) re-trying after making wrong decisions as shown in Figure 6. Lower numbers demonstrate to the player a higher standard of professional critical thinking.

Based on the design, the player should be able to figure out that there is one, out of the eight fact issues, which makes the situation unsolvable due to conflicts in related facts and evidence caused by illogical fact details as revealed by witnesses and evidence.
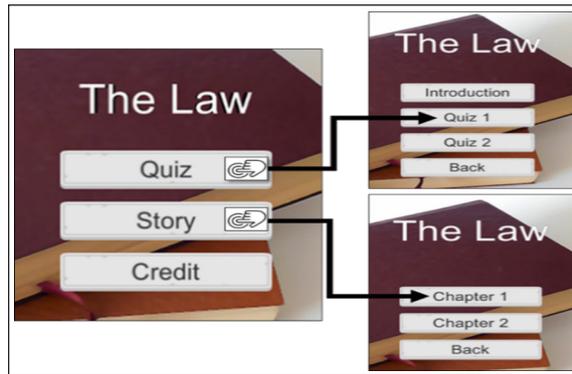
Figure 2. Demonstrating game stages including First Page, Quiz 1 & 2 and Story Stage (Case-based mission) with 11 sub-missions within Chapter 1-2

Figure 3. Demonstrating the game user interface of Quiz 1 & 2 and the Pop-Up feedback which helps promote game learning by providing additional explanation for correct answer

Figure 4. Demonstrating a game feature of case-based mission to promote learning engagement by providing volunteer with decision results in colors: green color for correct decision and red color for wrong decision
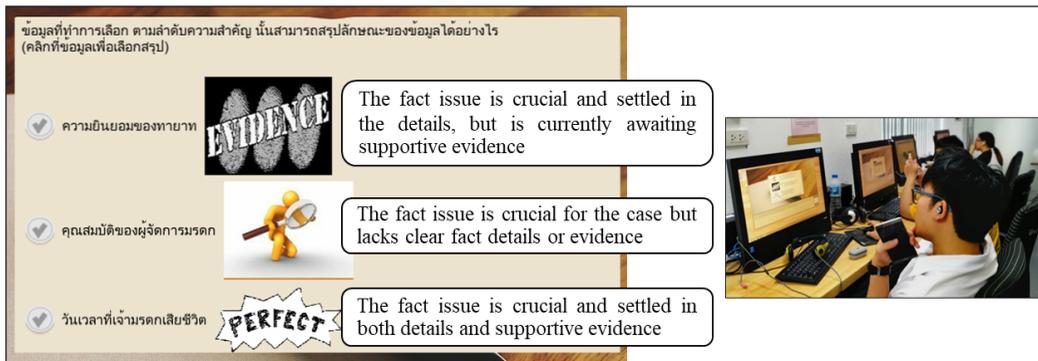
Figure 5. Demonstrating the game missions 8-9 which encourage volunteer to evaluate the quality of gathered facts acquired by previous volunteer's decisions in case-based mission

Figure 6. Demonstrating volunteer's final performance evaluation of case-based mission

Experimental Results Based on Knowledge Transferring Tool

Based on one purpose of the study, the following pre- and post-test scores analysis demonstrated the effectiveness of knowledge transfer between learning through the serious game and through the lecturing methods. Each member of the G group was represented with "G1 to G14" and the L group was represented with "L1 to L14".

Analysis of Pre-Test and Post-Test Score. The serious game aims at effective learning tool by which law students can learn by themselves outside the classroom. The participants are encouraged to complete the pre-test and post-test following the guideline information provided in the game package. After learning through the use of the serious game, each participant is expected to have post-test scores higher than the pre-test scores. The following results and analyses demonstrated the positive results from the comparison of the pre-test and the post-test scores as shown in Figure 7, Figure 8 and Table 1, and Table 2.

The T-test score analysis (N=14) comparing the test scores for all the participants of G group shows that the average pre-test score was 32.50 points
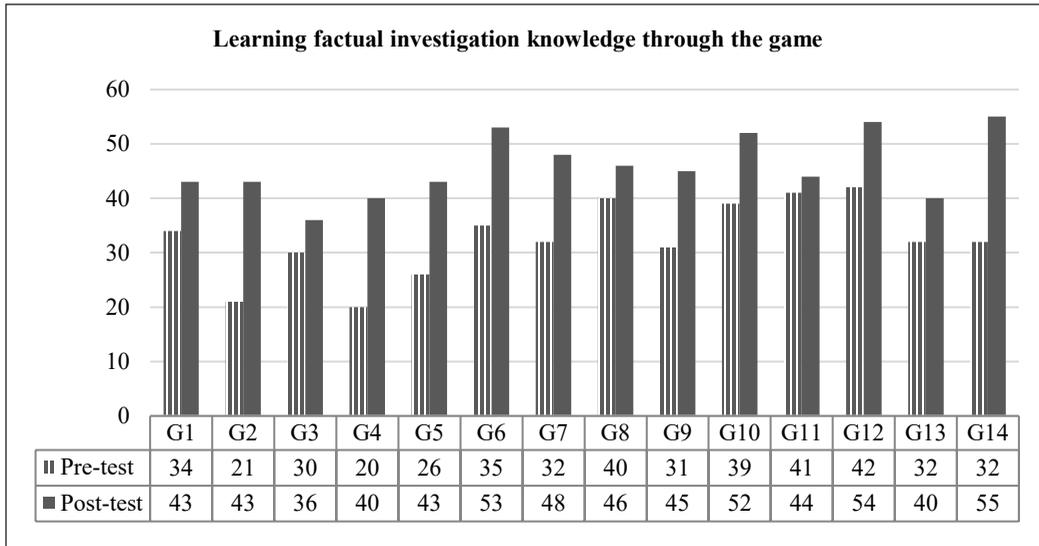
Learning factual investigation knowledge through the game

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14
Pre-test	34	21	30	20	26	35	32	40	31	39	41	42	32	32
Post-test	43	43	36	40	43	53	48	46	45	52	44	54	40	55

Figure 7. Analysis of the pre-test and the post-test scores of the student participants on learning via the factual investigation game. (Game)

Learning factual investigation knowledge through lecturing approach

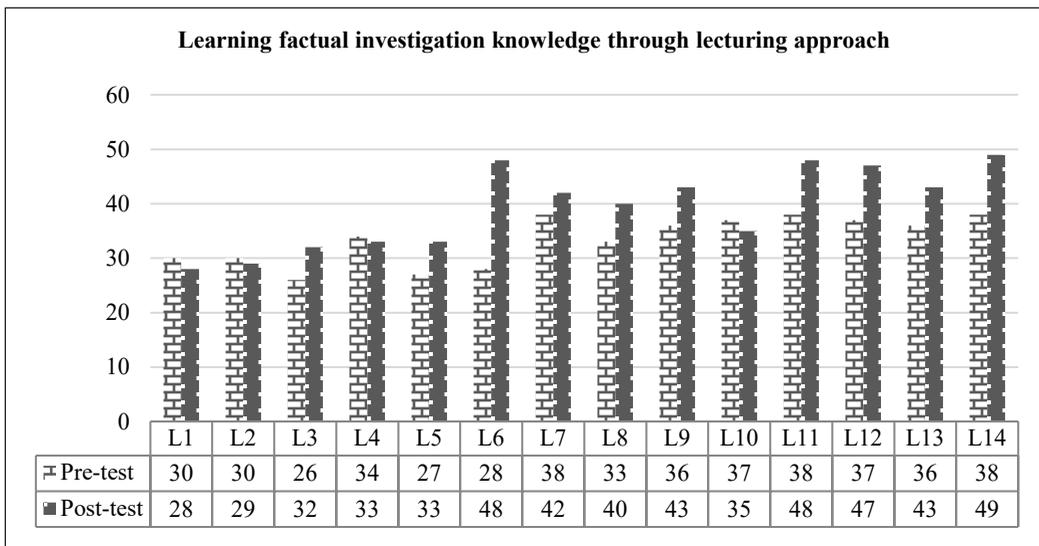|	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14
Pre-test	30	30	26	34	27	28	38	33	36	37	38	37	36	38
Post-test	28	29	32	33	33	48	42	40	43	35	48	47	43	49

Figure 8. Analysis of the pre-test and the post-test scores of the student participants on learning factual investigation via lecturing approach. (Lecture)

Table 1
Pre-test and post-test analyses by paired sample T-test of factual investigation learning via game

Game method	Participants	Mean	Std. deviation	t	P-value
Pre-Test	14	32.50	6.84	-7.908^*	.000
Post-Test	14	45.85	5.80		

*Statistical significance at .05

Table 2
Pre-test and post-test analyses by paired sample T-test of factual investigation learning via lecturing approach

Lecturing method	Participants	Mean	Std. deviation	t	P-value
Pre-Test	14	33.43	4.39	-3.585*	.003
Post-Test	14	39.29	7.46		

*Statistical significance at .05

Table 3
Post-test analyses by paired independent sample T-test of factual investigation learning between lecturing and game method

Learning Method	Participants	Mean	Std. Deviation	t	P-value
Lecturing (L Group)	14	39.29	7.47	-2.60*	.015
Game (G Group)	14	45.86	5.80		

*Statistical significance at .05

and the average post-test score was 45.85 points. When both the average scores were tested, the T-test statistic yielded a significant difference at the 0.05 level (p<.05*), meaning that all participants progressively and significantly gained knowledge after learning through the game. There is a statistical difference between the average pre-test score and the average post-test score demonstrated by participants, as presented in Table 1.

The T-test score analysis (N=14) comparing the test scores for all the participants of L group shows that the average pre-test score was 33.43 points and the average post-test score was 39.29 points. When both the average scores were tested, the T-test statistic yielded a significant difference at the 0.05 level (p<.05*). It was shown that all participants had satisfactorily gained new knowledge after learning through the lecturing method, as presented in Table 2.

When both the post-test scores of all participants between L group and G Group were tested, Independent Sample T-Test statistic yielded a significant difference at the 0.05 level (p<.05*) as shown in Table 3. The game has a higher potential in transferring factual investigation knowledge to all participants than the lecturing method because there is a statistical difference between the average difference between the pre and post-test scores of lecturing method and the average pre and post-test scores of the game method demonstrated by participants.

Analysis of Pre-Test and Post-Test Mean Scores Based on The Six Higher-Order Thinking Concepts Whichever in Education of Bloom's Taxonomy. The following Figure 9 and Figure 10 show that the post-test mean scores for each of the six cognitive domains of Bloom's Taxonomy were higher than the pre-test scores in all aspects. That demonstrated that all participants of L group and G group had in general acquired higher knowledge of aspects of factual investigation in varying degrees.
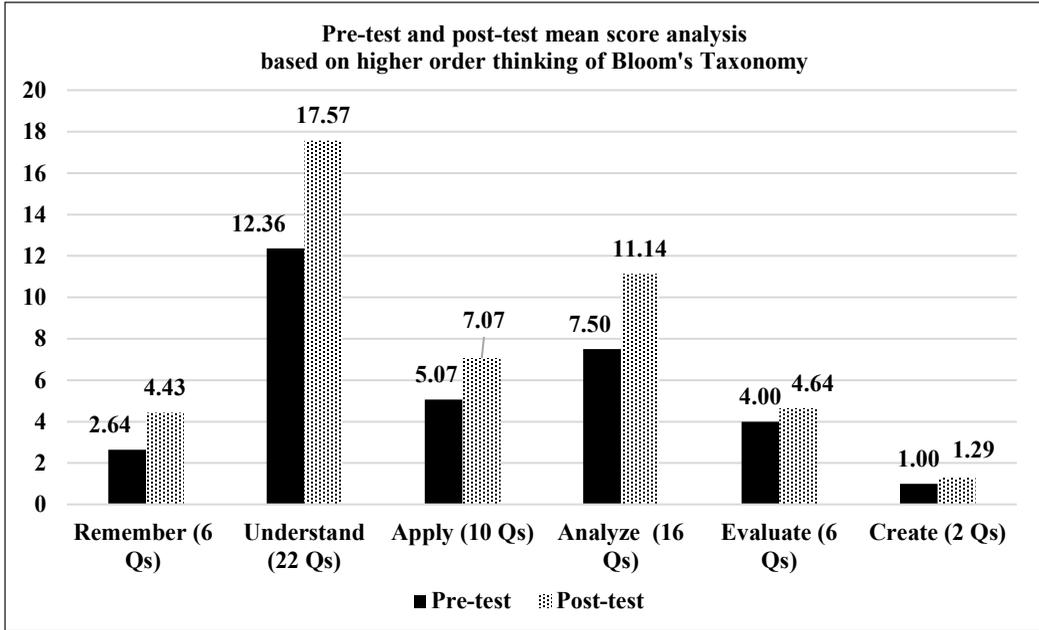
Pre-test and post-test mean score analysis based on higher order thinking of Bloom's Taxonomy

Figure 9. Mean score analysis of pre & post-test results based on the six higher order thinking concepts in education of Bloom's taxonomy of learning factual investigation knowledge through the game. (Game)
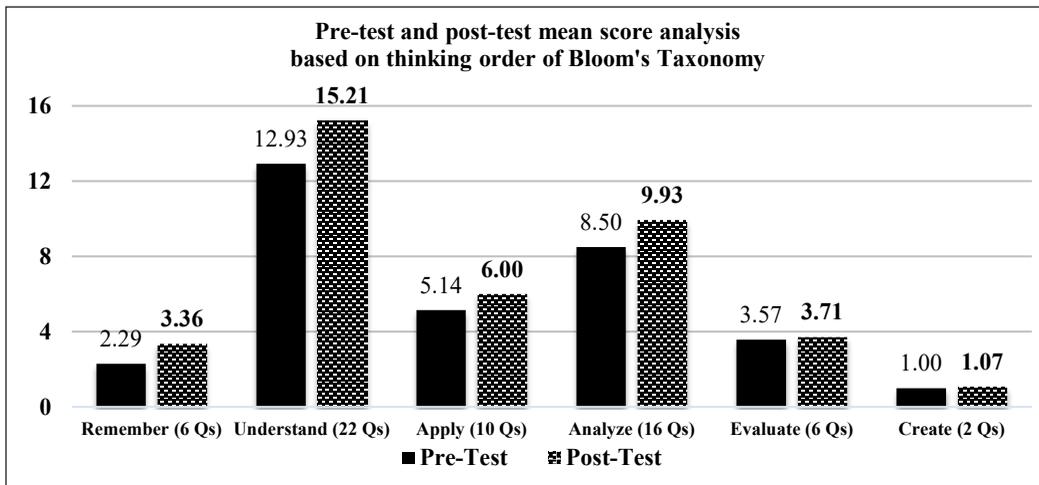
Pre-test and post-test mean score analysis based on thinking order of Bloom's Taxonomy

Figure 10. Mean score analysis of pre & post-test results based on the six higher order thinking concepts in education of Bloom's taxonomy of learning factual investigation knowledge through lecture. (Lecture)

Moreover, Figure 9 and Figure 10 comparisons additionally showed the students who self-learned factual investigation knowledge through the game had mean scores higher than the lecturing method's students in all questions related to particular aspects of understanding, applying, and analysing the facts and relevant questions to determine them.

Experimental Results Based on Learning Engagement Promotion

Post-interview responses and observation of the behaviour of the participants were applied to identify how the game and lecturing methods encouraged engagement in learning of the participants.

Post-Learning Interview Analysis. Allowing participants to respond freely, with encouragement for positive and negative impressions, feedbacks were recorded immediately after game or lecture completion, particularly on the issue of the learning matter and learning approach designs

Generally, most participants in the G and L Groups stated that they were satisfied with the learning approach. Additionally, they also gave some impressions and made some suggestions about the learning approach. There were some comments which might be perceived as positive feedback of their interest.

(1) Positive feedback from Participants of G Group. Fifty-seven percent (57%) of the participants stated that the game design provided them a new game with challenging experiences which were different from previous online games which they had played purely for entertainment.

Thirty-five percent (35%) of the responses spoke positively about the game encouraging the learner's critical thinking, urging the learner to conduct self-questioning, Mission by Mission during the game. Most players expressed a curiosity to know the answers.

Twenty-eight percent (28%) of the players reflected that the game was quite a new approach in the law school and full of useful practical knowledge and processes. The case-based mission and the last game stage made them feel like actual legal counsellors for legal clients.

Twenty-one percent (21%) of the participants regarded playing the fact-finding game as more worthwhile than spending two or three hours trying to acquire the knowledge by reading.

However, they felt that the game Missions were difficult because they had never learned the skills before. Conversely, they ultimately gained knowledge even from their mistakes during the game. The dialogue box which provided extra knowledge through explanation was a great approach in imparting additional learning without the aid of classrooms.

(2) Suggestions from Participants of G group. Fifty-seven percent (57%) of the players mentioned that the quality of the game system and the computer graphic design needed improvement and redesign to make the game more attractive.

Forty-three percent (43%) of the participants requested more legal case challenges as options which can be categorized by the difficulty level, from beginner level to advanced level, or by the nature of legal expertise, such as, criminal law cases, business law cases, labour law cases, etc. It should be noted that such comments also indicate that the participants were sufficiently engaged with the game

to want more kinds of optional legal cases which could extend their knowledge and critical thinking.

(1) Positive Feedback from Participants of L Group. Fifty-seven percent (57%) of participants stated that the class encouraged them to learn new and very useful knowledge beyond the curriculum.

Fifty percent (50%) of participants mentioned that all the case studies and techniques of factual investigation skill as described in the classroom was enlightening.

Thirty-seven percent (37%) of responses reflected that knowledge transferring techniques of the lecturer during the class was good, as a result of a relaxed learning atmosphere and engagement.

(2) Suggestions from Participants of L Group. Fifty-seven percent (57%) of participants reflected that the class time of four hours was too short for an optimum learning result.

Fourteen percent (14%) of participants requested that the action learning part be increased for a better learning result.

Seven percent (7%) of participants stated that learning through the game style should have been more fun than lecturing method based on their past experiences playing other games.

Seven percent (7%) of participants stated that the factual investigation skill should be a compulsory course under the law curriculum.

Reaction of Participants Towards the Game and Lecturing Approaches. The more a participant engages in a well-designed learning method, the more likely that he or she will gain deeper knowledge. Based on learning engagement dimensions (Trowler & Trowler, 2010), the video recordings and observations showed many positive learning engagement actions by participants in the game and lecturing methods.

(1) G Group. Most participants stayed focused on their personal computer screen from the first game stage for 2-3 hours. No one disturbed other participants except for game discussion. Some felt annoyed if a technical problem interrupted their game (Behavioural engagement).

Participants exercised their critical thinking for every decision in the game. Some applied note-taking or snap shooting, consulting a friend for some information or to discuss a previous wrong decision to benefit from new analysis or opinion. Some requested further discussion and guidance from the instructor with regard to their failures in the current tough Mission of the story stage before retrying the same Mission (Cognitive engagement).

Some participants obviously expressed joyful actions, smiles, laughing, surprise for unexpected right answers, or bluffing a friend regarding game progression (Emotional engagement).

(2) L Group. Most of the participants stayed focused on just the first half of 3

hours of lecturing time. Some one third of participants (4-5 law students) periodically took a nap in class and others occasionally played on their smartphones during the class. The lecturer had to encourage participants with interesting case studies related to the particular knowledge (Behavioural engagement).

As a result of the small classroom, most students were listening, however, only some students, particularly in the first three front rows, participated with the series of questions and case studies analysis (Cognitive engagement).

Participants generally did not express any obvious joyful moments or exciting feelings but did show inspiring moments to learn new knowledge of factual investigation skills (Emotional engagement).

DISCUSSION

The analysis of Figures 7 to 10 and Tables 1 to 2 indicated that the cognitive learning of all students had generally developed after learning. Both the game approach and the lecturing method have potential in transferring factual investigation knowledge to law students at a satisfying level. It is evident that learning through the game has more potential in knowledge transfer as shown in Table 3 and learning engagement promotion based on a comparison of pre- and post-test analysis and post-interview.

In term of learning engagement promotion which potentially impacts upon learning ability (Halm, 2015; Park, 2003), the post-learning interviewing and observation additional data showed that the self-learning game more actively impacted the participants' engagement than the lecturing method. The participants in the G group were consistently positive and enthusiastic throughout the three to five hours of the game, depending on the different participants' performance. Observed behaviours indicated that they were excited and eager to complete each Mission and curious to know what exactly was the right answer in each Mission, which implies normal adult learning behaviour when being stimulated. Some participants had not only informative discussions with friends about their game decisions during the lunch break but were also inspired by the game to learn more from additional legal cases under the game.

The game design demonstrated strong potential in stimulating the learning engagement and curiosity through game interaction at various levels. Meanwhile, the behaviour observation and post-learning interview of samplings of L group did not show lively reflection from a learning engagement perspective through the lecturing method. They mostly appreciated and requested extra time on learning new knowledge and applicable techniques of factual investigation due to it being beyond their former core classes and law curriculum. All participants in the G group focused on even the more difficult Missions throughout the three or four hours of learning. The mission and design of the game had a tendency to provide consistent active engagement more than a lecture. There were only a few of the L

group participants who requested additional action learning or alternative active learning approach.

CONCLUSIONS

Law is a dynamic field of knowledge. Therefore, a stronger emphasis on the skills is vital for a successful legal career. By using interactive learning games as described in this paper, core lawyer skills and concepts are sufficiently acquired by the learners with greater accessibility for mass and individual legal education beyond the constraints of lectures and traditional classroom methods of legal education. In terms of cognitive learning and knowledge management, the experimentation with the game presents satisfactory evidence that the factual investigation knowledge gained via game application not only makes up for the shortcomings of traditional lawyering skills learning but also provides a new exciting learning experience for all law novices.

Notwithstanding that the approach of this game has the potential for learning engagement while building a passion for legal-related fact inquisition, the functionality and user-friendliness of the game application does need some refining and improvement to gain pubic-wide acceptability, as suggested by the participants' feedback.

ACKNOWLEDGEMENTS

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