RedFame

Studies in Media and Communication
Vol. 13, No. 3; September 2025
ISSN: 2325-8071 E-ISSN: 2325-808X
Published by Redfame Publishing
URL: http://smc.redfame.com

Developing a Phenomenon-Based Learning Model Utilizing Digital Media on the LINE OA Application

Suwannee Thammaratthara[1], Surapon Boonlue[1], Sorakrich Maneewan[1], Kuntida Thamwipat[1]

[1]Department of Educational Communications and Technology, Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi, Bangkok, Thailand

Correspondence: Kuntida Thamwipat, King Mongkut's University of Technology Thonburi, Bangkok, 10140, Thailand.

Received: April 2, 2025 Accepted: May 12, 2025 Online Published: May 20, 2025

doi:10.11114/smc.v13i3.7635 URL: https://doi.org/10.11114/smc.v13i3.7635

Abstract

This research aimed 1) to develop and evaluate the quality of a phenomenon-based learning model with a digital learning companion to enhance commercial law competency for the entrepreneurship of Thai vocational students; and 2) to study the competence in knowledge of commercial law, skills, and attributes for the entrepreneurship of students after learning with the develop learning model and media. Data were collected from a sample group using a cluster sampling method from 25 vocational students in the business computer program in 2024. The research results found that the phenomenon-based learning model, "aCHIC model", was developed with the digital learning companion "brain lump" on the LINE OA application. The quality of the content was found to be very good ($\bar{x}$=4.98, SD = 0.03), as was the quality of the teaching media ($\bar{x}$=4.94, SD = 0.08). It was found that the knowledge competency (K) of commercial law in entrepreneurship after studying was higher than before studying at a statistical significance level of .05 (t-test = 12.71). In terms of the skills (S) competency of entrepreneurship, it was found that students were able to create a business plan by applying commercial law for eight businesses at a good competency level (80.40%). They had a competency of attributes (A) of entrepreneurship at a good attributes level (81.80%). The aCHIC model used with the brain lump that was developed can be applied in practice. It is a challenge to overcome cross-disciplinary skills and integrate students in commercial law to have an entrepreneurial mindset.

Keywords: learning model, phenomenon-based, digital media, LINE OA Application

1. Introduction

The 2023-2024 Global Entrepreneurship Monitor (2024) report places Thailand in group C, with a GDP per capita below 25,000 USD. Among Thai adults aged 18-64 who started a business in the past two years, 20-25% found it relatively easy to start a business, and a similar percentage see good opportunities to start one in the next six months. Although 75-80% report having the knowledge, skills, and experience to start a business, this rate is still lower than in Guatemala, India, Venezuela, and other countries in the same group. According to the Department of Business Development's 2022 annual report, Thailand had 850,480 registered businesses as of December 31, 2022, with 76,488 new businesses that year. However, 21,880 businesses closed, representing 2.57% of existing businesses and 28.61% of new ones. Common reasons for closure included a lack of systematic planning, weak management, and failure to adapt to change, highlighting gaps in entrepreneurial skills (Tooprioa, P., & Yamrung, R., 2021). According to the National Strategy 2018-2037 on the development and strengthening of human resources, economic and social development in the current context of Thailand shows that people are the heart of the development drive. Thai entrepreneurs must be created and developed to be new-age entrepreneurs who can keep up with and utilize technology and innovation to drive their businesses. (Office of the Secretary of the National Strategy Committee, 2018). In addition, the National Vocational Qualifications Framework 2019 sets the criteria for vocational qualifications and vocational education standards according to the qualification level and field of study in developing a competency-based vocational education curriculum or Competency Based Curriculum. This is developed into a vocational education curriculum to provide graduates with professional competencies that match professional competencies, allowing them to immediately take up a career as practitioners or work independently. In 2024, the quality of graduates must be consistent with the identity of the vocational curriculum, the nation, and the global context, consisting of at least four learning outcomes: 1. Morality, ethics, desirable characteristics, characteristics according to good social norms, and personal characteristics; 2. Knowledge; 3. Skills; and 4. Ability to apply and take responsibility (Office of the Vocational Education Commission,

2024). The report on the development of potential and identity of Thai vocational workers in three main industries (Thianthai, J., & Suthamchai, K., 2022) found that there are several problems with Thai vocational education management. These include that the basic curriculum emphasizes memorization, the content is not updated to keep up with changes, some subjects have unnecessarily difficult content, a lack of diverse and appropriate teaching media, an insufficient number of teachers, a lack of expertise in the subjects taught, a lack of technological skills, and the family needs of students who have to work part-time to earn an income.

The commercial law course, which is a basic subject and a theoretical subject according to the vocational certificate curriculum, also has problems with the application of the law to students' careers, both starting to create their own brands or businesses during and after graduation. Students still do not have a clear picture of the methods and steps to follow the law in creating a business. Therefore, it is a challenge for commercial law teachers to develop what kind of learning models and teaching media should help develop students' necessary skills to keep up with the needs and changes in the global economy. Vocational students can overcome cross-disciplinary skills and have an entrepreneurial mindset. This can be achieved by developing a model and teaching media for commercial law teachers to support the shortage of teachers in the legal field and support learning anywhere, anytime for students.

Phenomenon-Based Learning (PhBL) is a learning management approach developed in Finland based on the Constructivist Learning Theory, which emphasizes learner-centered learning processes. The distinctive features of PhBL are cross-disciplinary integration and holistic learning, which enable learners to connect knowledge from various disciplines to understand complex issues or phenomena. The learning process begins with the teacher selecting a phenomenon appropriate to the learner's level. Then, learners jointly analyze which aspects of learning the phenomenon can lead to, including applying knowledge gained to solve problems or create new solutions. Learners play an important role in planning learning activities, determining approaches and methods for searching for information, exchanging knowledge, and synthesizing ideas to summarize new knowledge throughout the learning process. The teacher acts as a facilitator, creating an environment conducive to learning and supporting learners to express their ideas. It is also consistent with modern educational concepts that focus on adaptive learning, innovation, and the development of 21st century skills (Chaiwon, T., & Nugultham, K., 2021). Digital Learning Companion (DLC) is a supporting tool that plays an important role in enhancing the efficiency of learning today. Digital technology allows learners to access information sources and learning tools quickly and conveniently. Using technology in learning can result in learners developing skills and abilities more effectively than learning that does not use technology. Digital learning tools are usually programs or applications that promote learning in both self-learning and collaborative learning formats, such as computer programs or online media that can be accessed via an internet connection using a computer or smartphone. (Nithiwaratsakul, P., et al., 2023).

This is an essential area for vocational students enrolled in commercial law courses at the vocational certificate level, as these courses fall under the professional competence category. Commercial law competence enables students to understand the fundamentals of commercial law and develop skills in preparing relevant documents—crucial skills that support various career paths. To develop entrepreneurial competence, students need to cultivate an entrepreneurial mindset and master interdisciplinary skills. According to Platts-Mills, E. and Wapples, E. (2023), effective law education for aspiring entrepreneurs should focus on raising awareness of legal issues, identifying new business opportunities, and building the confidence to take action—core elements that help students instinctively embrace entrepreneurship. Ronstadt, R. (1987) as cited in Kuratko, D. F. (2011), emphasizes that entrepreneurship education should foster entrepreneurial behaviors to support students' success. Kuratko, D. F. (2011) also highlights Solomon, G. T., et al. (2002), who discuss the challenges educators face in creating impactful learning experiences for entrepreneurship students. The researcher saw the challenge in developing a PhBL model in collaboration with DLC to study commercial law competencies in the entrepreneurship of vocational certificate students, which was the origin of this research study.

The research on the PhBL model with DLC to enhance commercial law competency for Thai vocational students' entrepreneurship has the following two objectives:

1) To develop and evaluate the quality of a phenomenon-based learning model with a digital learning companion to enhance commercial law competency for the entrepreneurship of Thai vocational students.

2) To study the competence in knowledge of commercial law, skills, and attributes for the entrepreneurship of students after learning with the develop learning model and media.

2. Literature Review

2.1 Phenomenon-Based Learning

This study reviews literature on PhBL, an approach that integrates multiple subjects and topics, breaking down

traditional boundaries. This method requires students to apply information and skills in a systematic, holistic way within real-world contexts. Teachers play a dual role as facilitators and stimulators of learning, creating engaging, interactive lessons (Schaffar, B., & Wolff, L.-A., 2024; Silander, P., et al., 2022). To make learning enjoyable, teachers choose interesting phenomena, analyze how learning units apply to these topics, add new activities when necessary, plan activity sequences, and encourage student participation. This approach helps students gain new knowledge and skills. Teachers may also experiment with different learning units to find the most effective ways to engage students and encourage them to take control of their own learning (Shermer, M., 2016). PhBL is a student-centered approach focused on real-world experiences. It emphasizes hands-on activities, experiential learning, and exploration of real-life phenomena. In this model, teachers guide and organize the learning process rather than merely impart knowledge (Symeonidis, V., & Schwarz, J. F., 2016). It is a reflective process, ensuring that students not only acquire the required skills and knowledge but can also apply them independently in future learning contexts, (Mathewson, T. G., 2019) as cited in Elo, P. (2019)

2.2 Digital Learning Companion

According to Chou, C.-Y., et al. (2003), a DLC is a system that includes a human student, a teacher, and a computer-simulated companion that supports students during their learning activities, allowing for repeated practice. A DLC is a type of Intelligent Tutoring System (ITS) that incorporates a computer companion, enhancing traditional ITS environments (Uresti, J. R., 2000). Similar to chatbots like ChatGPT, it acts as a strategy generator, using IT tools to support learning (Schlimbach, R., et al., 2023). A DLC is an online instructional tool that provides personalized, one-on-one learning through communication technologies, giving students access to additional educational resources (Tran, K., et al., 2023). The teacher's role in this system is to guide students, manage their learning, and adapt teaching methods to meet individual needs (Seibert, J., et al., 2020). Schlimbach, R., et al. (2024) describe a virtual learning companion (VLC) as a learning tool designed to address students' unique challenges and needs, especially through distance and blended learning technologies. A VLC promotes lifelong learning by engaging students anytime and anywhere.

2.3 Commercial Law Competency

A review of the literature defines competency as a combination of knowledge, behaviors, and skills that enable individuals to perform effectively (Boyatzis, R. E., 1981; Chung, R.-G., & Wu, C.-Y., 2011; Draganidis, F., & Mentzas, G., 2006; Ryan, R. M., & Deci, E. L., 2020; Wong, S.-C., 2020). According to Boyatzis, R. E. (1981) and McClelland, D. C. (1973), competency consists of five main factors: 1. Knowledge – the essential information needed to perform a task; 2. Skills – abilities developed from knowledge and refined through training; 3. Traits – personal characteristics or qualities expressed in behavior; 4. Self-concept – a person's self-image or perception; and 5. Motives – internal drivers that guide behavior towards achievement. Parry, S. B. (1996) later grouped the last three factors (Traits, Self-concept, and Motives) under "attributes." According to Frederick, H. and Kuratko, D. F. (2010), entrepreneurs must also understand various legal frameworks, as these are essential to entrepreneurial competency.

2.4 Related Research

Research studies related to PhBL management include Bercasio, R. and Adornado, R. A. (2023) studying "Enriching high school English lessons with global citizenship education using phenomenon-based learning", Kangas, M. and Rasi, P. (2021) studying "Phenomenon-based learning of multiliteracy in a Finnish upper secondary school", Santhalia, P. W., et al. (2020) studying "Building students' problem-solving skill in the concept of temperature and expansion through phenomenon-based experiential learning", Yuliati, L., et al. (2020) studying "Acquisition of projectile motion concepts on phenomenon based physics' experiential learning", and finally, Yuliati, L. (2018) studying "Exploration of physics problem-solving skills within phenomenon-based learning in senior high school students." It was found that there has been no development of PhBL models with DLC and no specific study on commercial law competencies in promoting entrepreneurship among vocational students.

3. Method

3.1 Study Context and Sample Group

This research collected data at the Bangkok College of Business Administration and Tourism (BC-BAT), under the Office of the Vocational Education Commission (OVEC), which teaches commercial law as a compulsory subject in the professional competency category, basic professional competency group, for students at the vocational certificate level, majoring in business computer. Some teachers teach directly in law, while other colleges under the OVEC lack teachers who teach directly in law.

The population consists of vocational certificate students at the BC-BAT, under the OVEC, who registered for the commercial law course in the first semester of the 2024 academic year, totaling 120 people. The sample group was

selected using cluster random sampling, consisting of 25 second-year vocational certificate students majoring in business computing (Gall, M., et al., 2007).

3.2 Research Process

3.2.1 The First Phase

Development of the PhBL Model with DLC on the LINE OA application to enhance commercial law competence in vocational students' entrepreneurship

The media analysis and design process were used with the 5-step ADDIE model (Kurt, S., 2018; Rizal, R., et al., 2021; Salas-Rueda, R. A., et al., 2020), as shown in Table 1.

Table 1. Media analysis and design process using ADDIE model

No.	Stage	Research tools	
		PhBL Model	DLC System
1	Analysis	1.1 The competence of the commercial law course in the vocational certificate curriculum, OVEC, Ministry of Education. 1.2 A group of Thai vocational students at the vocational certificate level. 1.3 The commercial law competence for entrepreneurship among Thai vocational students, in accordance with the criteria for vocational education qualifications at the vocational certificate level.	
2	Design	The PhBL model with DLC to enhance commercial law competency for Thai vocational students' entrepreneurship. (Silander, P., et al., 2022; Schaffar, B., & Wolff, L.-A., 2024; Shermer, M., 2016; Symeonidis, V., & Schwarz, J. F., 2016)	DLC system (Chou, C.-Y., et al., 2003; Uresti, J. R., 2000; Schlimbach, R., et al., 2023; Tran, K., et al., 2023; Seibert, J., et al., 2020; Schlimbach, R., et al., 2024)
3	Development	The details of the model named "aCHIC model" are divided into: 1. Classroom management and 2. DLC system	The system called “brain lump” on the LINE OA application. consists of: 1. Course content 2. Chatbot system
4	Implementation	4.1 Three law and three educational technology experts were selected by purposive sampling based on their occupation, education, or experience to assess the results of the index of consistency (IOC) between 0.67 - 1.00 (Rovinelli, R. J., & Hambleton, R. K., 1976). 4.2 The research was approved by the Research Ethics and Compliance Office, Research, Innovation and Partnerships at King Mongkut’s University of Technology Thonburi (Certificate Number: KMUTT-IRB-COA-2024-043) before data collection from the sample group commenced. 4.3 Twenty second-year certificate students in foreign languages who studied commercial law in the previous semester were tried out for two weeks.	
5	Evaluation	After analyzing and improving the model and system, the study was conducted with a sample group in the first semester of the 2024 academic year.	

3.2.2 The Second Phase

Development of a knowledge test, assessment of commercial law application skills and entrepreneurial attributes of vocational students

1. After studying the relevant documents, analyzing the content of the subject, the learner groups, and the competence in commercial law in being an entrepreneur of vocational students at the vocational certificate level, a knowledge test, an assessment of commercial law application skills, and an assessment of entrepreneurial attributes of vocational students were created.

2. The knowledge test (60 items) was given to experts obtained by purposive sampling in two areas: 1. Law, three persons, and 2. Educational technology, three persons, to consider and evaluate the IOC of the questions and the purpose asked. The IOC was between 0.67 and 1.00 (Rovinelli, R. J., & Hambleton, R. K., 1976) and could be used for 55 items. Then, the revised test was tested with the tryout group to select 40 items as pre-test and post-test. The difficulty analysis result (p) averaged 0.56, which is moderately difficult (good) (Backhoff, E., et al., 2000). The discrimination power (r) averaged 0.34, which is a good discrimination (usable) (McCowan, R. J., & McCowan, S. C., 1999). The reliability used the KR-20 formula of Kuder-Richardso (Rubio, D.M., 2005), with an average of 0.98, which is very high reliability.

3. The commercial law application skills assessment and entrepreneurial attributes assessment were given to three content experts to consider and assess the IOC of the questions and the purpose asked. The IOC was between 0.67 - 1.00 (Rovinelli, R. J., & Hambleton, R. K., 1976). All questions can be used. The experts gave suggestions. The research was revised to be more appropriate and printed for further observation of the sample group's behavior.

4. The research was approved by the Research Ethics and Compliance Office, Research, Innovation and Partnerships at King Mongkut's University of Technology Thonburi (Certificate Number: KMUTT-IRB-COA-2024-043) before data collection from the sample group commenced.

3.3 Data Analysis

This study utilized statistical methods to analyze assessment results and evaluation forms. The statistical tools employed include the mean, standard deviation, and t-test (Srisa-ard, B., 2011). The interpretation of the mean scores is as follows:

4.51 - 5.00	means	Very good
3.51 - 4.50	means	Good
2.51 - 3.50	means	Fair
1.51 - 2.50	means	Below average
1.00 - 1.50	means	Poor

Determining the percentage range of participation behavior and designing your own business plan using the rubric score criteria (Stevens, D.D., & Levi, A.J., 2023) is divided into three levels as follows:

85 - 100 %	means	Excellent
70 – 84.99 %	means	Good competence / Good attributes
50 - 69.99 %	means	Needs work

4. Results

4.1 Results of the Development and Evaluation the Quality of a PhBL Model with a DLC

4.1.1 The PhBL Model, "aCHIC Model," as Shown in Figure 1

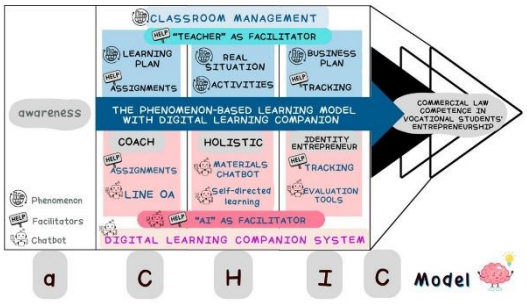

Figure 1. The PhBL Model, "aCHIC Model"

From Figure 1, before starting to manage learning using the "aCHIC model", teachers should create awareness (a) of the importance of commercial law competence of vocational students to prepare them to become entrepreneurs, in accordance with the main mission of OVEC.

The aCHIC model is divided into two parts: 1. Classroom management, with teachers facilitating learning throughout the classroom, and 2. A DLC system, with AI facilitating learning throughout the system. Learning management is carried out according to the following steps:

1. Coach stage (C): The teacher manages the class by creating a learning plan and explains the learning model using phenomena as a base. The teacher assigns students to select interesting phenomena to create their own business plans while the teacher develops a DLC system. The teacher explains the self-study method in the "brain lump" application via LINE OA.

2. Holistic stage (H): It is a holistic learning study with various real-world learning activities in the classroom along with students' self-study in the system. There are three levels of learning content through videos, exercises, games, Q&A via chatbots, coupons, additional links, and a platform for asking questions about commercial law in entrepreneurship with ChatGPT.

3. Identity entrepreneur stage (I): After learning for 6 weeks, the teacher follows up on the students' work until they can successfully create their own business plans individually or in groups based on the phenomena chosen by the students, including summarizing statistics on accessing the “brain lump” application and taking tests to evaluate the results. When the learning management is complete, it will affect the competence (C) in commercial law in being an entrepreneur of vocational students in three parts: 1. Knowledge, assessed from the test 2. Skill, assessed from the work of creating their own business plan, and 3. Attributes, assessed from the work behavior and attitude of the students.

Therefore, the aCHIC model is a learning model that allows students to create their own business plan and affects the competence in commercial law in being an entrepreneur.

4.1.2 The DLC System, “Brain Lump” on the LINE OA Application, as Shown in Figure 2

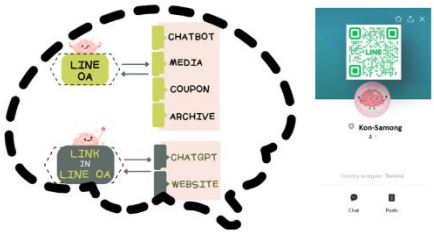

Figure 2. The DLC System, “Brain Lump” on the LINE OA Application

From Figure 2, the brain lump application consists of two main operating systems, as follows:

1. LINE OA main system: Teachers develop a Q&A system via chatbots, organizing teaching media content at three levels in the system's functions that connect to other websites such as Edpuzzle, Vonder Go, etc. Teachers set activities to provide coupons, notifications, and other information to be put in the system's database.

2. Supplementary system: Teachers create content to be a database of questions on commercial law in entrepreneurship with OpenAI's ChatGPT. Teachers provide external supplementary website links that are useful for promoting commercial law competencies in entrepreneurship for vocational students.

4.1.3 Evaluation of the Quality of Learning Models Using the PhBL Model with a DLC to Enhance Commercial Law Competence in Vocational Students' Entrepreneurship

The results of the content quality assessment by experts found that the average value of all aspects was 4.98, with a standard deviation of 0.03. When compared with the specified criteria, the overall quality was at a very good level. When considering the quality in each aspect, it was found that the item with the highest average value was the aspect of the learning model using the PhBL model with a DLC, and the aspect of content had a very good quality level ($\bar{x}$=5.00, S.D. = 0.00). The second highest average value was classroom management, with a very good quality level ($\bar{x}$=4.94, S.D. = 0.08).

The results of the teaching media quality assessment by experts found that the average value of all aspects was 4.94, with a standard deviation of 0.08. When compared with the specified criteria, the overall quality was at a very good level. When considering the quality in each aspect, it was found that the item with the highest average value was the chatbot system, with a very good quality level ($\bar{x}$=4.95, S.D. = 0.07). The second highest average value was the DLC system, with a very good level ($\bar{x}$=4.94, S.D. = 0.09).

4.2 Results of the Study of Commercial Law Competence in Entrepreneurship

After learning the content of commercial law in entrepreneurship, students must be able to create their own business plan. Students choose the phenomenon that they or their group are interested in and create different business formats as follows: one sole proprietorship, two unregistered general partnerships, four registered general partnerships, and one limited partnership, totaling eight. It is noteworthy that all businesses are registered for e-commerce (DBD registered) to certify that they really exist online, are legally registered for commerce, know basic business contracts, plan their business with consumers in mind, and know how to file taxes according to their business type. Then, they are evaluated from the test, the workpiece of creating a business plan, the students’ work behavior, and attitudes, as follows:

4.2.1 A Comparative Study of the Knowledge (K) Competency in Commercial Law in Entrepreneurship

Table 2. Results of a comparative study on commercial law knowledge competencies

Scores	N	$\bar{x}$	Correlation	t	df	Sig
Pretest	25	6.44	0.641	12.71	24	.000*
Posttest	25	12.88				

* $p < .05$

From Table 2, the results of the comparative study of knowledge (K) competency in commercial law in entrepreneurship of vocational students before and after studying with the developed learning model found that students who studied with the PhBL model with a DLC for 6 weeks had significantly higher commercial law knowledge than before studying at a statistical significance level of .05 ($p < .05$). The average knowledge after studying was 12.88. The results of the correlation examination between the scores before and after studying with the PhBL model with DLC showed a correlation of 0.641, a t-test value of 12.71 with a degree of freedom of 24 and a statistical significance level of .000.

4.2.2 Study on the Competency in Applying Commercial Law Skills (S) to Become Entrepreneurs of Vocational Students

Table 3. Results of the analysis of competency in applied commercial law skills

	Excellent		Good competency		Needs work		Average	
	Points	N	Points	N	Points	N	%	Points
Basic level	30	11	20	12	15	2	80.00	24.00
Intermediate level	30	9	20	14	15	2	77.33	23.20
Advanced level	40	13	30	7	20	5	83.00	33.20
								80.40

From Table 3, the results of the study of competency in skills (S) applying commercial law to entrepreneurship of vocational students found that students who studied with the PhBL model with a DLC had competency in skills applying commercial law at the basic level at 80.00 percent (24 out of 30 points), intermediate level at 77.33 percent (23.20 out of 30 points), and advanced level at 83.00 percent (33.20 out of 40 points). The total skill score was 80.40, which was at the good competency level (between 70-84.99%).

4.2.3 Study of the Competency Attributes (A) of Entrepreneurship of Vocational Students

Table 4. Results of the analysis of entrepreneurial attributes

	Excellent		Good attributes		Needs work		Average	
	Points	N	Points	N	Points	N	%	Points
Motives	50	13	40	5	30	7	84.80	42.40
Self-concept	25	12	15	10	10	3	76.80	19.20
Traits	25	15	15	6	10	4	80.80	20.20
								81.80

From Table 4, the results of the study of competency attributes (A) entrepreneurship of vocational students found that students who studied with the learning model using the PhBL model with a DLC had the attributes of applying commercial law to be entrepreneurs. In terms of motives, it accounted for 84.80 percent (42.40 out of 50 points), self-concept accounted for 76.80 percent (19.20 out of 25 points), and traits accounted for 80.80 percent (20.20 out of 25 points). The total attributes score was 81.80, which was at the good attributes level (between 70-84.99%).

5. Discussion

The results of the development of a PhBL model, “aCHIC model”, use the 5-step ADDIE model design principles of Kurt, S. (2018), Rizal, R., et al. (2021), Salas-Rueda, R. A., et al. (2020). It is a learning model that allows students to create their own business plans. A teacher acted as a facilitator for classroom management, while AI served as a facilitator through the “brain lump” application, a DLC system on LINE OA. This approach facilitated holistic teaching and learning management that began with awareness creation (a), inspiring students to develop their business plans by referencing real situations or case studies. The teaching process included the following steps. In coach (C) step, the teacher explained the PhBL model with a DLC over six weeks. They offered guidance on selecting phenomena relevant to the students' interests for their business plans and how to effectively use the brain lump application. Next, in the holistic (H) step, students engaged in various holistic methods of study both in and out of the classroom, leading to the development of their own business plans. In the last step, identity entrepreneur (I), students created their business plans individually or in groups based on the selected phenomena. This included assessing their commercial law competencies

as entrepreneurs. This process aligns with the concepts put forth by Schaffar, B. and Wolff, L.-A. (2024), Shermer, M. (2016), Silander, P., et al. (2022), and Symeonidis, V. and Schwarz, J. F. (2016). Each step of the aCHIC model emphasized using the phenomenon of creating a business plan as a foundation, promoting competence (C) in commercial law among vocational students in three areas: 1. Knowledge, 2. Skills, and 3. Attributes. The learning process involved a dynamic, iterative approach where students reviewed content at their own pace. With active teachers in the classroom and AI support in the system, learning was stimulated until the teachers were confident that students had acquired the necessary skills and content. Ultimately, this culminated in unique business plans crafted by the students in a "chic" style, consistent with Mathewson, T. G., (2019) as cited in Elo, P. (2019).

The development of the brain lump application as a DLC allows students to learn course content through videos, exercises, and game quizzes at basic, intermediate, and advanced levels. Additionally, students learn to utilize AI technology via a chatbot system on the LINE OA application, which connects to various knowledge-based websites and enables them to ask questions about commercial law competencies in entrepreneurship through ChatGPT. The brain lump application serves as a flexible teaching strategy that meets students' needs, allowing them to access lessons as often as needed for review outside the classroom. This promotes self-regulation through digital social interactions among students. This approach aligns with the principles of learning companion systems (Chou, C.-Y., et al., 2003; Schlimbach, R., et al., 2023; Uresti, J. R., 2000) and a DLC (Schlimbach, R., et al., 2024; Seibert, J., et al., 2020; Tran, K., et al., 2023). A key feature of the brain lump application is that it offers students a variety of learning topics. They can choose from standard topics organized by difficulty—basic, intermediate, and advanced—or select topics of personal interest for review. The application also includes a ChatGPT teacher as a supplementary resource, providing answers to questions before students consult with real teachers in the classroom. Additionally, it features a notification system and coupons to enhance engagement. Overall, the brain lump application promotes student attributes such as motivation and an internal drive to become entrepreneurs, as well as a positive self-concept regarding their entrepreneurial identity.

The evaluation results of the content quality found that the average value of all aspects was at a very good level ($\bar{x}$=4.98, S.D. = 0.03). The evaluation results of the teaching media quality found that the average value of all aspects was at a very good level ($\bar{x}$=4.94, S.D. = 0.08), which is consistent with hypothesis 1 and the results of the study by Bercasio, R. and Adornado, R. A. (2023). It was found that it focused on learners, promoted active learning by learning from diverse experiences and related teaching media, and met the different learning needs of students. It is consistent with the results of the study by Kangas, M. and Rasi, P. (2021), which found that it was a cross-curricular and interactive activity between subjects, which is an important element in learning based on phenomena. The idea is to design a collaborative learning process, stimulate students' interest by asking questions, jointly plan and select phenomena they are interested in, and conduct evaluations between teachers and students.

The results of the study on knowledge (K) competency in commercial law in entrepreneurship of vocational students after studying were significantly higher than before studying at a statistical level of .05. Students learned content at three levels. Students understood the lessons differently according to their experiences and the phenomena that students chose to create different business plans. This is in line with the goal of developing a learning model that aims to create diversity in understanding each student's business plan, according to the concept of Gerald, B. (2018) and is consistent with the results of Funfuengfu, V.'s (2022) study. It was found that the scores of the active learning competency test after the study were significantly higher than before at a statistical level of .05, consistent with the results of Yuliati, L., et al.'s (2020) study.

The results of the study on the competency of skills (S) in applying commercial law, analyzed from the assessment of business plan creation skills, had a score of 80.40, which is at the good competent level. When considering separately, it was found that advanced level operational skills had the highest score, accounting for 83.00 percent. The content in this section discusses the personal data protection law on electronic data storage and the computer crime law on displaying data in electronic form, which is content that students often encounter when using mobile phones and social media. Intermediate level skills had the lowest score, accounting for 77.33 percent. The content was a new law on the electronic registration of business operators, which may be distant and unfamiliar to students. The results of the study on the competency of attributes (A) entrepreneurship, analyzed from students' work behavior, had a score of 81.80, which is at the good attributes level, consistent with hypothesis 2. When considered separately, it was found that motives had the highest score, accounting for 84.80 percent, derived from statistics on access to the brain lump application. This may be because of close monitoring of students' work, teacher facilitation, and AI, which affect students' motivation to create entrepreneurial business plans. The assessment of skills and attributes uses the rubric teaching assessment criteria. This criterion is an example of a clear change in assessment that focuses on students, promotes student success, teachers provide constructive and targeted feedback, encourage students to actively participate in creating work, change students' perspectives on their abilities and potential, and help teachers better

understand their own teaching methods (Ragupathi, K., & Lee, A., 2020).

From the analysis of competencies covering all aspects, it can be considered that after learning using the aCHIC model with the brain lump application, it can enhance vocational students to have commercial law competencies for entrepreneurship, consisting of commercial law knowledge (K), commercial law application skills (S), and entrepreneurial attributes (A), in line with the concepts of Parry, S. B. (1996), McClelland, D. C. (1973), and Boyatzis, R. E. (1981). This is because it is a model that emphasizes learners' self-regulation, with teachers and AI as facilitators throughout learning, learning from multi-level teaching media repeatedly, asking for information via the chatbot system anytime, anywhere, and being able to create their own business plans individually or in groups according to the selected phenomenon, resulting in higher knowledge competencies from PhBL. Competence in business plan application skills is at a standard level and competence in attributes is also at a standard level. It is caused by motivation to be an entrepreneur, having a business plan concept, and a sense of responsibility in doing business at a standard level. It is consistent with the concepts of Bird, B. (1995), McClelland, D. C. (1973), and Solomon, G. T., et al. (2002) as cited in Kuratko, D. F. (2011), that skills or competencies can be changed, learned, and further developed by teaching the right things, methods, and from experience. In addition, learning commercial law content with the integration of entrepreneurial competence for vocational students is a challenge in organizing teaching and learning to overcome cross-disciplinary skills, integrating vocational students in commercial law subjects to have entrepreneurial thinking. Because the attributes of entrepreneurs need to know the legal framework in various aspects, it is consistent with the concepts of Frederick, H. and Kuratko, D. F. (2010), Platts-Mills, E. and Wapples, E. (2023). As a result, after learning commercial law content in entrepreneurship, students can create their own business plan by selecting phenomena that they or their groups are interested in, thereby creating different business models. A total of eight businesses were created, all of which were DBD registered to ensure their online presence and legally registered by students who know basic business contracts, can plan a business with consumers in mind, and know how to file taxes by type of business, which are important legal foundations that new entrepreneurs should know. In line with the 2021-2030 strategic plan of the Southeast Asian Ministers of Education Organization (SEAMEO), it stipulates to support and increase the number of young people and adults with relevant skills, including technical and vocational skills, for employment, decent work and entrepreneurship by 2030 (Southeast Asian Ministers of Education Organization, 2021). This idea has also been supported by the white paper “Entrepreneurial learning for vocational education institutions: Guidelines from the United Nations Educational, Scientific and Cultural Organization” (UNESCO). The Youth Co: Lab project (United Nations Development Programme and Citi Foundation, 2017) was established to empower young people in the Asia-Pacific region to achieve the Sustainable Development Goals (SDGs) through leadership, social innovation and entrepreneurship. This is achieved in accordance with the policy of promoting entrepreneurship education in schools of the Organization for Economic Co-operation and Development (OECD) (Lackéus, M., 2015). It is also consistent with the study of Santhalia, P. W., et al. (2020), which found that students' problem-solving skills improved after being taught using phenomenon-based experiential learning. Moreover, it is consistent with the study of Yuliati, L. (2018), which found that students learned by learning phenomena through activities, practice explaining, and gradually learning various concepts, from abstract concepts to concrete concepts.

Recommendations

The DLC system has limitations in the automatic menu bar of LINE OA. It can only be learned via mobile phones. However, it can be solved by calling via a chatbot system instead. There are several recommendations for future studies that can be applied. Since the content in this study has three levels, each level promotes three competencies, and the duration of the PhBL activities with a DLC should be extended to more than six weeks so that students can learn gradually at their own pace. Teachers can also add a variety of activities to help enhance commercial law competencies in becoming entrepreneurs for vocational students.

6. Conclusion

The results of the development of a PhBL model, aCHIC model with the DLC “brain lump” on the LINE OA application to enhance commercial law competency for Thai vocational students' entrepreneurship found that the quality of the content was at a very good level ($\bar{x}$= 4.98, SD = 0.03), as was the quality of the teaching media ($\bar{x}$= 4.94, SD = 0.08). By incorporating the aCHIC model in conjunction with the “brain lump” on the LINE OA application into the six weeks learning plan of the commercial law subject for 25 second-year vocational students studying commercial law, majoring in business computer, in the first semester of the 2024 academic year, BC-BAT, it was found that the students had higher knowledge (K) of commercial law after studying than before studying. Statistically significant at the .05 level (t-test = 12.71), the skills (s) of commercial law application in creating business plans were at the good competent level (80.40%), and the attributes (A) of entrepreneurship were at the good attributes level (81.80%). The aCHIC model was a learning approach that empowered students to develop their own business plans while enhancing their competence in commercial law as aspiring entrepreneurs. Combined with the use of a developed ‘brain lump’ tool, the

model was practically applicable. It also presented a valuable challenge—fostering cross-disciplinary skills and cultivating an entrepreneurial mindset among students in the field of commercial law.

Acknowledgements

This study was funded by the Petchra Pra Jom Klao Master's Degree Research Scholarship from King Mongkut's University of Technology Thonburi. It was reviewed and approved by the Research Ethics and Compliance, Research, Innovation and Partnerships Office of King Mongkut's University of Technology Thonburi.

We would like to extend our sincere thanks to Asst. Prof. Thanis Tangkitjaroenkun, Assistant Dean for Student Competency Development and Internationalisation of King Mongkut's University of Technology Thonburi, for his kind assistance in helping read the manuscript.

Authors' contributions

Suwannee Thammaratthara, Surapon Boonlue, and Sorakrich Maneewan were responsible for study design and revision by Kuntida Thamwipat. Suwannee Thammaratthara were responsible for media production and data collection. Suwannee Thammaratthara, Surapon Boonlue, and Kuntida Thamwipat drafted the manuscript and revised it. Kuntida Thamwipat was a corresponding author. All authors read and approved the final manuscript.

Funding

The Petchra Pra Jom Klao Master's Degree Research Scholarship from King Mongkut's University of Technology Thonburi.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

Informed consent

Obtained

Ethics approval

The Publication Ethics Committee of the Redfame Publishing.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned ; externally double-blind peer reviewed.

Data availability statement

The data support the findings of this study are available on request from the corrresponding author. The data are not publicly available due to privacy of ethical restrictions.

Data sharing statement

No additional data available.

References

Backhoff, E., Larrazolo, N., & Rosas, M. (2000). The level of difficulty and discrimination power of the basic knowledge and skills examination (EXHCOBA). *Revista Electrónica de Investigación Educativa, 2*(1), 1-16. https://www.researchgate.net/publication/266332601

Bercasio, R., & Adornado, R. A. (2023). Enriching high school English lessons with global citizenship education using phenomenon-based learning. *Randwick International of Education and Linguistics Science Journal, 4*(2), 216-232. https://doi.org/10.47175/rielsj.v4i2.651

Bird, B. (1995). Toward a theory of entrepreneurial competency. *Advances in Entrepreneurship, Firm Emergence and Growth, 2*, 51-72. https://www.academia.edu/1282975/Toward_a_theory_of_entrepreneurial_competency

Boyatzis, R. E. (1981). *The competent manager. A model for effective performance*. Wiley. https://www.researchgate.net/publication/247813294_The_Competent_Manager_A_Model_For_Effective_Perfor

mance

Chaiwon, T., & Nugultham, K. (2021). Phenomenon-based learning: Integrated learning for enhancing learners' knowledge in the real world. *Journal of Graduate Studies Valaya Alongkron Rajabhat University, 15*(2), 251-263. https://so02.tci-thaijo.org/index.php/JournalGradVRU/article/view/246642

Chou, C. Y., Chan, T. W., & Lin, C. J. (2003). Redefining the learning companion: The past, present, and future of educational agents. *Computers & Education, 40*(3), 255-269. https://doi.org/10.1016/S0360-1315(02)00130-6

Chung, R. G., & Wu, C. Y. (2011). The identification of personnel director's competency profile through the use of the job competence assessment method. *African Journal of Business Management, 5*(2), 405-415. https://academicjournals.org/article/article1380536203_Chung%20and%20Wu.pdf

Draganidis, F., & Mentzas, G. (2006). Competency based management: A review of systems and approaches. *Information Management & Computer Security, 14*(1), 51-64. https://doi.org/10.1108/09685220610648373

Frederick, H., & Kuratko, D. F. (2010). *Entrepreneurship: Theory, process, practice* (2nd ed.). 1010 Printing International Limited. https://www.researchgate.net/publication/305328636

Funfuengfu, V. (2022). The development of phenomenon-based learning model for enhancing active learning competencies of teacher students. *Journal of Positive School Psychology*, *2022*, 1366-1377.

Gall, M., Gall, J., & Borg, R. (2007). *Educational research: An introduction* (8th ed.). Pearson Education.

Gerald, B. (2018). A brief review of independent, dependent and one sample t-test. *International Journal of Applied Mathematics and Theoretical Physics, 4*(2), 50-54. https://doi.org/10.11648/j.ijamtp.20180402.13

Global Entrepreneurship Monitor. (2024). *GEM 2023/2024 global report-25 years and growing*. Retrieved from https://gemconsortium.org/report/global-entrepreneurship-monitor-gem-20232024-global-report-25-years-and-growing

Kangas, M., & Rasi, P. (2021). Phenomenon-Based learning of multiliteracy in a Finnish upper secondary school. *Media Practice and Education, 22*(4), 342-359. https://doi.org/10.1080/25741136.2021.1977769

Kuratko, D. F. (2011). Entrepreneurship theory, process, and practice in the 21st century. *International Journal Entrepreneurship and Small Business, 13*(1), 8-17. https://doi.org/10.1504/IJESB.2011.040412

Kurt, S. (2018). *ADDIE model: Instructional design. Educational Technology*. Retrieved from https://educationaltechnology.net/the-addie-model-instructional-design/

Lackéus, M. (2015). *Entrepreneurship in education*. Retrieved from https://www.oecd.org/en/publications/entrepreneurship-in-education_cccac96a-en.html

Mathewson, T. G. (2019, December 10). *The teacher's role in Finland's phenomenon-based learning*. Retrieved from https://www.kqed.org/mindshift/55006/

McClelland, D. C. (1973). Testing for competence rather than for "intelligence." *American Psychologist, 28*(1), 1-14. https://doi.org/10.1037/h0034092

McCowan, R. J., & McCowan, S. C. (1999). *Item Analysis for Criterion-Referenced Tests*. ERIC. Retrieved from https://eric.ed.gov/?q=Item+Analysis+for+CriterionReferenced+Tests&id=ED501716

Nithiwaratsakul, P., Sutthadaanantaphokin, K., & Kongpan, N. (2023). Digital learning for new teachers. *Journal of Educational Innovation and Research, 7*(2), 677-686. https://doi.org/10.14456/jeir.2023.45

Office of the Secretary of the National Strategy Committee (2018). *National strategy 2018 – 2037*. Thailand. Office of the National Economic and Social Development Council. http://nscr.nesdc.go.th/ns/

Office of the Vocational Education Commission (2024). *National Vocational Qualifications Framework 2024*. Thailand. Ministry of Education. https://moe360.blog/2024/02/05/national-vocational-qualifications/

Parry, S. B. (1996). The quest for competencies. *Training; Minneapolis, 33*(7), 48-54. https://www.proquest.com/docview/203398191?sourcetype=Trade%20Journals

Platts-Mills, E., & Wapples, E. (2023). Thinking like entrepreneurs: Qlegal's experience of teaching law students to have an entrepreneurial mindset. *International Journal of Clinical Legal Education, 2023*: Special edition, 73-108. https://doi.org/10.19164/ijcle.2023.1317

Ragupathi, K., & Lee, A. (2020). Beyond Fairness and Consistency in Grading: The Role of Rubrics in Higher Education. In: Sanger, C. & Gleason, N. (Eds.), *Diversity and Inclusion in Global Higher Education* (pp. 73-95). Palgrave Macmillan. https://doi.org/10.1007/978-981-15-1628-3_3

Rizal, R., Rusdiana, D., Setiawan, W., & Siahaan, P. (2021). Development of a Problem-Based Learning Management System-Supported Smartphone (PBLMS3) application using the ADDIE model to improve digital literacy. *International Journal of Learning, Teaching and Educational Research, 20*(11), 115-131. https://doi.org/10.26803/ijlter.20.11.7

Rovinelli, R. J., & Hambleton, R. K. (1976). *On the use of content specialists in the assessment of criterion-referenced test item validity*. ERIC. Retrieved from https://eric.ed.gov/?id=ED121845

Rubio, D.M. (2005). *Alpha reliability*, In Encyclopedia of social measurement, Elsevier.

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology, 61*, 1-11. https://doi.org/10.1016/j.cedpsych.2020.101860

Salas-Rueda, R. A., Salas-Rueda, E. P., & Salas-Rueda, R. D. (2020). Analysis and design of the web game on descriptive statistics through the ADDIE model, data science and machine learning. *International Journal of Education in Mathematics, Science and Technology (IJEMST), 8*(3), 245-260. https://doi.org/10.46328/ijemst.v8i3.759

Santhalia, P. W., Yuliati, L., & Wisodo, H. (2020). Building students' problem-solving skill in the concept of temperature and expansion through phenomenon-based experiential learning. Proceedings of the 1st International Conference on Mathematics, Science and Computer Education, *Journal of Physics: Conference Series, 1422*, 1-6. https://doi.org/10.1088/1742-6596/1422/1/012021

Schaffar, B., & Wolff, L.-A. (2024). Phenomenon-based learning in Finland: a critical overview of its historical and philosophical roots. *Cogent Education, 11*(1), 1-14. https://doi.org/10.1080/2331186X.2024.2309733

Schlimbach, R., Khosrawi-Rad, B., Lange, T. C., Strohmann, T., & Robra-Bissantz, S. (2024). Design knowledge for virtual learning companions from a value-centered perspective. *Communications of the Association for Information Systems, 54*, 293-330. https://doi.org/10.17705/1CAIS.05411

Schlimbach, R., Spill, M. F., & Robra-Bissantz, S. (2023). Increasing the value-in-interaction with adaptable learning companions. *Proceedings of the International Conference on Information Systems Education Research, India*, 1-18. https://www.researchgate.net/publication/375165022

Seibert, J., Schmoll, I., Kay, C. M., & Huwer, J. (2020). Promoting education for sustainable development with an interactive digital learning companion students use to perform collaborative phosphorus recovery experiments and reporting. *Journal of Chemical Education, 97*(11), 3992-4000. https://doi.org/10.1021/acs.jchemed.0c00408

Shermer, M. (2016). *Phenomena-Based Learning*. Making Sense of SCIENCE. Retrieved from https://mss.wested.org/resource/phenomena-based-learning/

Silander, P., Riikonen, S., Seitamaa-Hakkarainen, P., & Hakkarainen, K. (2022). *5: Learning computational thinking in phenomena-based co-creation projects: Perspectives from Finland*. The MIT Press. https://doi.org/10.7551/mitpress/13375.003.0008

Southeast Asian Ministers of Education Organization. (2021). *SEAMEO strategic plan 2021–2030*. Retrieved from https://tcg.uis.unesco.org/wp-content/uploads/sites/4/2021/11/SEAMEO-Strategic-Plan-2021%E2%80%932030.pdf

Srisa-ard, B. (2011). *Preliminary research* (9th ed.). Suwiriyasan. https://www.car.chula.ac.th/display7.php?bib=1929148 [in Thai]

Stevens, D. D., & Levi, A. J. (2023). *Introduction to Rubrics* (2nd ed.). ImprintRoutledge.

Symeonidis, V., & Schwarz, J. F. (2016). Phenomenon-based teaching and learning through the pedagogical lenses of Phenomenology: The recent curriculum reform in Finland. *Forum Oświatowe, 28*(2), 31-47. https://www.researchgate.net/publication/313696751

Thianthai, J., & Suthamchai, K. (2022, May). *Final report: The development of capabilities and uniqueness of Thai vocational labor in three focal industries: An analysis of Thai vocational labor journey maps in the new normal*. Thailand. National Research Council of Thailand. https://khonthai4-0.net/academies_knowledge_detail.php?id=7&sub_category_id=27&content_id=59

Tooprioa, P., & Yamrung, R. (2021). *The development of curriculum approach to enhance entrepreneur competence and corporate social responsibility for upper secondary school students*. [Doctoral dissertation, Srinakharinwirot University]. http://ir-ithesis.swu.ac.th/dspace/handle/123456789/1516

Tran, K., Weng, C., Tran-Nguyen, P. L., Astatke, M., & Tran, N. D. (2023). What are tutors' perceptions of an online tutoring project-digital learning companion-during the COVID-19 pandemic? A case study in Taiwan. *Universal Access in the Information Society, 23*(3), 1-17. https://doi.org/10.1007/s10209-023-00976-1

United Nations Development Programme and Citi Foundation. (2017). *Youth Co: Lab*. Retrieved from https://www.youthcolab.org/

Uresti, J. R. (2000). The LECOBA learning companion system: Expertise, motivation and teaching. *International Journal of Continuing Engineering Education and Life-Long Learning, 11*(3), 1-13. https://doi.org/10.1504/IJCEELL.2001.000395

Wong, S. C. (2020). Competency definitions, development and assessment: A brief review. *International Journal of Academic Research in Progressive Education and Development, 9*(3), 95-114. https://doi.org/10.6007/IJARPED/v9-i3/8223

Yuliati, L., Nisa, F., & Mufti, N. (2020). Acquisition of projectile motion concepts on phenomenon based physics' experiential learning. *Proceedings of the 1st International Conference on Mathematics, Science and Computer Education, Journal of Physics: Conference Series, 1422*, 1-6. https://doi.org/10.1088/1742-6596/1422/1/012007

Yuliati, L. (2018). Exploration of physics problem-solving skills within phenomenon-based learning in senior high school students. *Proceedings of the International Conference on Education, 4*, 97-103. https://doi.org/10.17501/icedu.2018.4111