RICE Journal

of Creative Entrepreneurship and Management

VOLUME 4 NUMBER 2
MAY-AUGUST 2023
ISSN 2821-9074 (Online)
ISSN 2730-2601 (Print)
https://ricejournal.rmutr.ac.th

ISSN 2821-9074 (Online)
ISSN 2730-2601 (Print)

RJCM

RICE JOURNAL OF CREATIVE ENTREPRENEURSHIP AND MANAGEMENT

Rattanakosin International College of Creative Entrepreneurship (RICE)
Rajamangala University of Technology Rattanakosin (RMUTR), Thailand

Volume 4, Number 2, May-August 2023

Published by:
Rattanakosin International College of Creative Entrepreneurship (RICE)
Rajamangala University of Technology Rattanakosin (RMUTR), Thailand

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RICE Journal of Creative Entrepreneurship and Management (RJCM)
Rattanakosin International College of Creative Entrepreneurship (RICE)
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About Us

RJCM is an international journal for academics and scholars at the higher education level to communicate and share their viewpoints and academic work with fellow professionals in the areas of creative entrepreneurship and management as practiced in their fields of specializations in social sciences. Currently, it is classified as Tier 2 in Thai-Journal Citation Index (TCI).

RJCM publishes three numbers per volume annually and welcomes contributors to submit their manuscript in January, May, and September of each year. We accept both academic and research papers in social sciences from contributors. The papers are double-blind three-peer-reviewed in each volume and published online-plus-print thrice a year.

The length of the unformatted manuscript in WORD can be 15-25 pages in length including references. The contents of the manuscript should include (1) a title with the author's name, affiliate, email address and telephone contact, (2) an abstract of 150 words with 3-5 keywords, (3) an introduction, (4) a rationale and background of the study, (5) research objectives, (6) research methodology, (7) data collection procedure, (8) data analysis, (9) results and discussion, (10) research limitation (if any), (11) conclusion, (12) acknowledgement(s) (if any), (13) the author's biography of about 50-80 words, 14) references, and (15) an appendix or appendices (if any).

All interested readers and paper contributors please contact Editor-in-Chief 2: Ruja Pholsward, Ph.D., Associate Professor, Rattanakosin International College of Creative Entrepreneurship (RICE), Rajamangala University of Technology Rattanakosin (RMUTR), <rujajinda@gmail.com>, <ruja.pho@rmutr.ac.th>. Please kindly note that website submission will be advised after the first editorial screening.

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RICE Journal of Creative Entrepreneurship and Management (RJCM)
Rattanakosin International College of Creative Entrepreneurship (RICE)
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Note from the Editors of *RJCM* Volume 4 Number 2

Dear *RJCM* Readers,

You are now with our second issue in Year 4 of *RICE Journal of Creative Entrepreneurship and Management* (*RJCM*). This issue contains six articles in the areas of marketing management, human resource management in tourism, educational and learning management.

In this issue, we have two papers on marketing management: *"Notebook Computer Brand Choice Intention and Use Behavior of College Students Majoring in Computer Science in Chengdu, Sichuan, China"* (Article 1), *and "The Causal Factors for Entrepreneurial Intention among Students in Business Administration at a Private University in Nong Khaem District, Bangkok"* (Article 2). There are two papers on human resource management in tourism, and educational management: *"Factors Affecting the Retention of Operational Employees in 5-star Hotels: A Case Study of Aetas Lumpini Hotel"* (Article 3), *and "Strategic Adaptive Leadership Development of Administrators of Eastern Vocational Education Institutions toward Excellence: A Focus on Thailand's Vocational Education Management 4.0 Policy"* (Article 4). The last two papers report research findings in learning management: *"Practical Learning Management System Combined with Case-Based Learning on Educational Resource Administration in the Digital Era"* (Article 5), *and "Guidelines for Organizing Computer Science Courses at the Elementary Level"* (Article 6). As for *Sharing Professional Viewpoint*, the author shared her concern over the use of smartphones and communication skills: *"The Impact of Smartphones on Face-to-Face Communication Skills and Social Interactions."* These papers report interesting findings and current issues in the areas under study.

Our paper contributors in the second issue of 2023 are researchers from six higher education institutions in the central provinces of Thailand: (1) Assumption University of Thailand, (2) Southeast Asia University, (3) Kasetsart University, Kamphaeng Saen Campus, (4) Rajapruk University, (5) Educational Innovation Institute of Promoting Alternative Education Association, and (6) Rattanakosin International College of Creative Entrepreneurship (RICE), Rajamangala University of Technology Rattanakosin (RMUTR).

The editors-in-chief hope that the research findings and current developments reported in these papers will be interesting to both researchers and practitioners in similar fields of study. The *RJCM* editorial team and the authors would appreciate our readers' comments about these articles, if possible. We always welcome contributions from those who may wish to be part of our *RJCM* network.

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Address from RICE Director

Nuttapong Jotikasthira, Ph.D.
Rattanakosin International College of Creative Entrepreneurship (RICE)
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Dear *RJCM* Readers,

We are now in the post period of the Covid-19 pandemic that has impacted the ways we lead our academic lives in teaching, learning and doing research. Scholars need to adjust themselves in communicating with their peers, colleagues, counterparts and students under their teaching responsibilities. Some have turned to a hybrid mode in working by combining an electronic platform of their choice with human contacts as seen fit in their context. Such adjustments have led to studies on new models of teaching-learning as well as innovative means to share ideas and conference agendas via electronic means currently available for communication. We have also witnessed the greater role of AI in the paths of work and life worldwide. The direction we are heading to with AI as our smart assistant has raised more and more public agitation with the ethical use of human-like devices. This is a matter of individual as well as global concerns over the futuristic applications of the information technology humans have claimed to master for the great good of mankind.

As new innovative developments evolving out of the huge circle of technology applications, scholars and researchers have selected their channels of communication, conscientiously work toward their academic goals on adding new knowledge and research findings to the existing body of knowledge in their areas of specialization. In this regard, the articles contributed to *RICE Journal of Creative Entrepreneurship and Management* after the post-pandemic time are always of great value to the academic communities at both the local and international levels.

I feel much obliged to all the authors for contributing the betterment of their work to academic communities. Your research in different fields of management and creative entrepreneurship certainly helps reexamine all current issues under study for sharing and bridging our academic interest in the years to come.

ISSN 2821-9074 (Online)
ISSN 2730-2601 (Print)
RICE Journal of Creative Entrepreneurship and Management, Vol. 4, No.2, pp. 1-15,
May-August 2023

doi: 10.14456/rjcm.2023.7
Received 1.11.22/ Revised 25.07.23/ Accepted 15.08.23

Notebook Computer Brand Choice Intention and Use Behavior of College Students Majoring in Computer Science in Chengdu, Sichuan, China

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Abstract

This study investigates key factors influencing of notebook computer brand choice intention and use behavior among computer science major students in Chengdu, Sichuan, China. Perceived ease of use, perceived usefulness, behavioral intention, and use behavior were associated in a conceptual framework. The researchers used a quantitative approach for survey distribution to 878 participants. The sampling techniques involved the multi-stage sampling techniques of probability sampling, namely random sampling and stratified sampling to collect data. Item Objective Congruence (IOC) Index at 0.67 and Cronbach's Alpha reliability at 0.70 test were approved prior to the data collection period. Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM) were used to test models' goodness of fit, validity, and reliability. The results reveal that perceived usefulness has the strongest significant impact on behavioral intention, followed by perceived ease of use. Furthermore, behavioral intention strongly and significantly influences the use behavior. The findings indicate that using notebook computer brands has gained potential and popularity among students majoring in computer science in Chengdu and Sichuan districts, for learning effectiveness. Therefore, computer brand companies may need to prepare a variety of notebooks with appropriate design and technical specifications for students in computer science in support of their learning performance

Keywords: *perceived ease of use, perceived usefulness, behavioral intention, use behavior, notebook computer brand intention*

1. Rationale and Purposes of the Study

In today's age of rapid industrialization and globalization, the expansion of information technology has influenced practically every facet of human existence, including education. Especially in computer-related colleges, where notebook computers have become a crucial study tool for college students, the rapid growth and introduction of technology has posed new requirements for students' education and learning tools. Many laptop manufacturers have gone to considerable lengths to set themselves apart from one another by offering cutting-edge

innovations and superior quality. Students majoring in computing will use these considerations to guide their decision on which laptop brand to purchase. Students majoring in computer science typically decide on notebook manufacturers based on perceived ease of use and utility, search for information prior to purchasing, and assess product trust. In the decision-making process, behavior and intent play a vital role. People rely on social pressure and the use of a product to mitigate the risk associated with each buying decision. Olson & Jacoby (1972) separated brand selection into internal and external variables. According to Pananond & Zeithaml (1998), the internal and external determinants of brand selection are of equal importance, and brand is an important consideration for consumers when evaluating items. But there are more elements, such as utility and usability, which are inherent to the product and not necessarily straightforward to locate. Many previous studies only focus on two variables: trust and the social impact of brand, which may effectively explain the purchase intention of products (Lin & Chen, 2006; Udo et al., 2010; Jalilvand & Samiei, 2012; Bhakar et al., 2013). Nevertheless, it does not necessarily reflect actuality. A few researchers have examined the influence of behavioral intention, ease of use and usefulness on user behavior. Therefore, in this study, the researchers took behavioral intention as the moderating variable, and select two variables of internal product cues--usefulness and ease of use--as independent variables. The objective of this study was to investigate the brand choice intention and use behavior of Chengdu computer major students under study.

1.1 Introduction of computer major in Chengdu Universities

During 2017, the Ministry of Education presented the engineering construction education reform and growth strategy. New engineering refers mostly to the rising sectors represented by computer-related disciplines like artificial intelligence and computer science (Mu & Wang, 2020). The new engineering, according to Cabedo et al. (2018), is to update the curriculum of traditional engineering majors in higher education and reform education to accommodate the rapid development of emerging businesses. In the development strategy for computer science and other new engineering fields, it is emphasized that local colleges and universities should play a supportive role in regional economic development and industrial transformation, as well as upgrading and strengthening the link between theory and practice. New engineering focuses on new structures and systems, which must be founded on the development and reform of low-level disciplines like computer science. The fundamental courses of the computer major cover the internal workings of computers and the operational processes of computers (Dong et al., 2019).

1.2 Objectives of this Research

(1) To identify the causal relationship between perceived ease of use and perceived usefulness in behavioral intention to select and use notebook computer brand among computer science students in Chengdu and Sichuan, China.

(2) To illustrate the causal relationship between behavioral intention on use behavior among computer science students under study in selecting and using notebook computer brands.

(3) To make recommendations to computer brand companies and computer science students computer specifications required in computer science programs for learning performance optimization.

1.3 Research Questions

(a) Do perceived ease of use and perceived usefulness have significant impact on behavioral intention to select and use notebook computer brand among computer science students in Chengdu and Sichuan, China?

(b) Does behavioral intention have a significant impact on use behavior in selecting and using notebook computer brand among computer science students under study?

(c) What are recommendations for computer brand companies and computer science students regarding computer specifications required in computer science programs for students' learning performance optimization?

1.4 Significance of the Study

This study provided theoretical and practical information regarding college students' notebook computer brand intentions, particularly computer majors to help marketers understand brand personality traits and factors influencing college students' notebook computer brand decision intention, particularly those majoring in computer science across age groups. It was expected that the obtained findings should help computer developers to deliver products for students' needs and preferences for notebook computer brand choice. In addition, notebook computer manufacturers can supply effective equipment information before students' courses. The results of this research can also help notebook computer users to understand perceived ease of use, perceived utility, trust, social influence, convenience, behavior intention, and usage behavior as factors affecting consumers' brand choice and purchase intention.

2. Literature Review

2.1 Perceived Ease of Use

The perception of a system's technology's usability is known as perceived ease of use. It also describes how confident individuals are to utilize specific technologies (Chauhan, 2015). The perception of usability is a major predictor of future behavior (Davis, 1989). Multiple studies have demonstrated that this perspective influences an individual's behavior and motivation to utilize the target system (Venkatesh, 2000). Perceived usability predicts site and usage intention and will impact the uptake of mobile technology, particularly applications (Kim et al., 2016). The usability of the retrieval is regarded as the premise of its utility. In particular, perceived ease of use relates to "people's assumption that using a particular system is free" (Davis, 1989). This perceived ease of use is expressed by the extent to which individuals believe using technology is simple (Davis, 1989). The TAM suggests that perceived ease of use affects perceived utility (Davis, 1989). However, Koufaris (2002) noted that certain

research findings imply that perceived usefulness is a more reliable predictor than perceived usability. Moreover, Kucukusta et al. (2015) verified the influence of perceived ease of use and perceived usefulness on usage intention in various IT scenarios (including online reservations). Gaur & Kumar (2018) postulated that perceived usability influences perceived utility. People who can acquire and master new technology with minimal effort will value it more. Benamati et al. (2010) examined the impact of technical insights, such as perceived ease of use and perceived usefulness, on initial credibility. Thereby, the hypothesis is constructed as follows:

Hypothesis 1 (H1): Perceived ease of use has a significant impact on behavioral intention to select and use notebook computer brand among computer science students in Chengdu and Sichuan, China.

2.2 Perceived Usefulness

Perceived usefulness is described as a person's belief that using a certain technology would increase their productivity. It is also characterized as a user's willingness to adopt new technologies (Davis, 1989). According to other researchers, perceived usefulness identifies the users' anticipation that the system technology would help them enhance their job performance, which is an important factor in determining whether to employ it (Bhattacherjee & Sanford, 2006). Majdalawi et al. (2014) used Technology Acceptance Model (TAM) with its core dimensions of perceived usefulness and perceived ease of use. The possibility that a user would engage in the intended activity is referred to behavioral intention (Ajzen, 1991). Although discovering practicability sects are a critical predictor of behavioral intention, subjective pleasure can demonstrate a substantial variety in action transcending intentions that rely on perceived usefulness distinctiveness (Davis et al., 1992). The perception of system quality is necessary for perceived usefulness and perceived ease of use, but the subjective measurement of information system availability is essential for perceived availability (Lederer et al., 2000). Perceived utility implies that people are willing to believe that a technical skill might improve their work performance (Davis, 1989). The Technology Acceptance Model (TAM) states that perceived ease of use influences perceived utility (Davis, 1989). Moon & Kim (2001) found that perceived playfulness positively correlates with the intention to use websites for work and entertainment purposes. In contrast, perceived usefulness as focus attention, thirst for knowledge, and pleasure only influence behavioral intention for the meaning and purpose of work. Subsequently, a hypothesis is derived:

Hypothesis 2 (H2): Perceived usefulness has a significant impact on behavioral intention to select and use notebook computer brands among computer science students in Chengdu and Sichuan, China.

2.3 Behavioral Intention and Use Behavior

Behavioral intention is taken from a psychology theory that focuses on complete action and explains why people adopt a certain system (Chauhan, 2015). Behavioral intention describes how much effort/desire a person must carry out a specific activity (Fishbein & Ajzen,

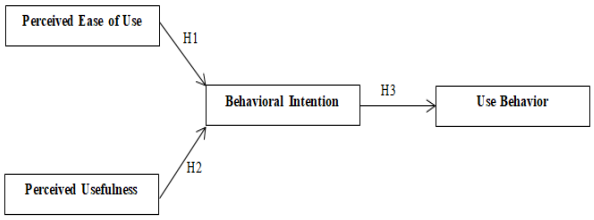
1975). The stronger desire of an individual to do something, the more likely they will perform an action (Ajzen, 1991). The actual frequency of technology use was a standard metric for measuring usage patterns (Venkatesh et al., 2003). Regarding usage behavior, it is the frequency with which a person employs technological resources. In most situations, usage behavior may also be determined by the frequency with which the technology is employed (Venkatesh et al., 2003). Several studies have indicated that user behavior can enhance mobile phone payment and purchasing power as a result of the constant evolution and transformation of the social environment (Hubert et al., 2017). Convenience and purpose in behave have a considerable beneficial effect on the usage of online question-and-answer services (Deng et al., 2011). Suggestions for correct Information and Communication Technology (ICT) usage as a solution for identified improper use (Abaidoo & Arkorful, 2014). Alkhasawneh & Alanazy (2015) asserted that responsible usage of technology will result in superior academic achievement. Also, based on this study, Venkatesh et al. (2003) argued that enabling situations may block or increase the positivity or negativity of use behavior, and that the inhibition of convenience conditions would have a negative effect on user behavior. On the other hand, appropriate and sufficient enabling circumstances may have a beneficial effect on behavior. Consequently, a hypothesis is derived:

Hypothesis 3 (H3): Behavioral intention have a significant impact on use behavior of selecting and using notebook computer brand among computer science students in Chengdu and Sichuan, China.

3. Conceptual Framework

The three significant theories provide the following: perfect ease of use, perfect use effectiveness, behavioral intention, and use behavior. For the previous research framework, Zhou et al. (2010) hosted the first research framework. The second research framework, the variables, such as performed ease of use, performed usefulness, came from Christian et al. (2020). This study aimed at verifying the impact of perceived usefulness on the behavior intention of an autopilot. Ukut & Krairit (2019) proposed the third framework. The results pointed to promotion conditions, social influence, and voluntariness directly and significantly affecting students' academic performance and teachers' views. The variables behavioral intention, and use behavior came from this article. Figure 1 summarizes the proposed hypotheses.

Figure 1: Conceptual Framework



H1: Perceived ease of use has a significant impact on behavioral intention to select and use notebook computer brand among computer science students in Chengdu and Sichuan, China.

H2: Perceived usefulness has a significant impact on behavioral intention to select and use notebook computer brands among computer science students in Chengdu and Sichuan, China.

H3: Behavioral intention have a significant impact on use behavior of selecting and using notebook computer brand among computer science students in Chengdu and Sichuan, China.

4. Research Methods and Materials

This quantitative study applied probability sampling in distributing questionnaire copies to undergraduate students in computer science programs who owned notebook computer brands in Chengdu and Sichuan, China. The students in Computer and Software Engineering at the College of Chengdu Neusoft University and the School of information and business management voluntarily participated in the study and responded to the questionnaire.

The questionnaire contains three sections. First, screening questions were designed to identify valid respondents with the appropriate criteria (Voß et al., 2020). Demographic information, such as gender, year of study, computer brands, and majors, was collected for descriptive analysis. The researchers used a five-point Likert scale to evaluate the questionnaire items (Salkind, 2017).

Prior to data collection, the item-objective congruence (IOC) index was used to invite three marketing experts and educational professionals to assess content validity. The IOC of all items was pegged at 0.67 or above. Clark-Carter (2010) determined through pilot testing that 30 respondents were sufficient. Cronbach's Alpha coefficient values were tested to establish internal consistency dependability of at least 0.70 (Nunnally & Bernstein, 1994).

The data were collected from 878 voluntary undergraduates in early 2023. The researchers analyzed the data using the statistical applications SPSS and AMOS. In addition, confirmatory factor analysis (CFA) was performed to assess factor loading, t-value, composite reliability (CR), average variance extracted (AVE), and discriminant validity. Subsequently, the structural equation model (SEM) was used to assess the hypotheses and the significance level of each association.

5. Results and Discussion

5.1 Demographic Information

The demographic data of 878 respondents were:

Gender: Males 21.48%, Females 78.52%

College education: Internet of things engineering 65.4%, Software engineering 23.4%, Computer science and technology 11.2%.

Year of study: First year 24.37%, Second year, 25.21%, Third year 25.42%, and Fourth year 25%.

Notebook computer brand: Lenovo 24.5%, ASUS 21.8%, Dell 9.3%, Huawei 20.2%, and Acer 24.2%

5.2 Confirmatory Factor Analysis (CFA)

CFA was performed to confirm the number of constructs and factor loadings among the observed variables (Malhotra et al., 2004). Initially, a measurement model was developed to assess the adequacy of fit. Table 1 shows that the goodness of CFA fits, as measured by CMIN/DF, GFI, AGFI, NFI, CFI, TLI, and RMSEA, was adequate.

According to the statistical findings reported in Table 2, Cronbach's Alpha values of more than 0.70 are acceptable. In addition, acceptable values are indicated by factor loadings greater than 0.50, t-values greater than 1.98, p-values smaller than 0.50, composite reliability (CR) greater than 0.70, and average variance extracted (AVE) greater than 0.50. (Hair et al., 2006). CFA was therefore authorized to certify convergent and discriminant validity.

Table 1: Goodness-of-Fit for Measurement Model

Fit Index	Acceptable Criteria	Source	Before Adjustment Values	After Adjustment Values
CMIN/DF	< 5.00	Awang (2012); Al-Mamary and Shamsuddin (2015)	5.928	2.716
GFI	≥ 0.85	Sica and Ghisi (2007)	0.803	0.877
AGFI	≥ 0.80	Sica and Ghisi (2007)	0.746	0.871
NFI	≥ 0.80	Wu and Wang (2006)	0.754	0.884
CFI	≥ 0.80	Bentler (1990)	0.946	0.923
TLI	≥ 0.80	Sharma et al. (2005)	0.943	0.913
RMSEA	< 0.08	Pedroso et. al. (2016)	0.068	0.059

Note: CMIN/DF = the ratio of the chi-square value to degree of freedom, GFI = Goodness-of-fit index, AGFI = Adjusted goodness-of-fit index,

NFI = Normed fit index, CFI = Comparative fit index, TLI = Tucker-Lewis index, and RMSEA = Root mean square error of approximation

Table 2: Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)

Latent Variables	Source of Questionnaire	No. of Items	Cronbach's Alpha	Factors Loading	CR	AVE
Perceived Ease of Use (PEOU)	Davis (1989); Pipitwanichakarn and Wongtada (2020)	4	0.847	0.626-0.877	0.855	0.548
Perceived Usefulness (PU)	Tao et al. (2011); Alam et al. (2018)	5	0.876	0.659-0.920	0.884	0.661
Behavioral Intention (BI)	Hsiao et al. (2016); Rai (2020)	3	0.857	0.568-0.898	0.867	0.626
Use Behavior (UB)	Alam et al. (2018)	3	0.868	0.642-0.874	0.873	0.582

Source: Wang et al. (2023)

The convergent validity was determined when the value of CR is larger than AVE, while the AVE is higher than 0.50 (Hair et al., 2006). The values of the discriminant validity were examined and found exceeding the critical point values as demonstrated in Table 3. Consequently, the convergent validity and the discriminant validity of this research were adequate.

Table 3: Discriminant Validity

	PEOU	PU	BI	UB
PEOU	**0.740**			
PU	0.367	**0.813**		
BI	0.388	0.354	**0.806**	
UB	0.290	0.212	0.294	**0.766**

Note: The diagonally listed value is the AVE square roots of the variables.
Source: Wang et al. (2023)

5.4 Structural Equation Model (SEM)

After the CFA process, the structural equation model (SEM) was conducted to estimate a linear equation and verify a structural model fit. Additionally, SEM determines the causal relationship among the variables (Suwannasri & Nuangjamnong, 2022; Jin & Nuangjamnong, 2022). The results were shown in Table 4, adjusted by SPSS AMOS. CMIN/DF, GFI, AGFI, CFI, TLI and the RMSEA are all approved. Consequently, each indicator of the goodness of fits in SEM verification for this research was acceptable.

Table 4: Goodness of Fit for Structural Model

Fit Index	Acceptable Criteria	Source	Before Adjustment Values	After Adjustment Values
CMIN/DF	< 5.00	Awang (2012); Al-Mamary and Shamsuddin (2015)	5.820	2.911
GFI	≥ 0.85	Sica and Ghisi (2007)	0.758	0.851
AGFI	≥ 0.80	Sica and Ghisi (2007)	0.727	0.821
NFI	≥ 0.80	Wu and Wang (2006)	0.942	0.876
CFI	≥ 0.80	Bentler (1990)	0.934	0.914
TLI	≥ 0.80	Sharma et al. (2005)	0.931	0.903
RMSEA	< 0.08	Pedroso et. al. (2016)	0.096	0.062

Note: CMIN/DF = the ratio of the chi-square value to degree of freedom, GFI = Goodness-of-fit index, AGFI = Adjusted goodness-of-fit index,
NFI = Normed fit index, CFI = Comparative fit index, TLI = Tucker-Lewis index, and RMSEA = Root mean square error of approximation

5.5 Research Hypothesis Testing Result

The significance of each variable is determined by regression weights and R^2 variance. Based on the results in Table 5, the support relationship has p-values less than 0.05. The strongest effect is presented in the relationship between perceived ease of use and behavioral intention with a standardized path coefficient (β) of 0.393 (t-value = 5.677***). Perceived usefulness also has a significant impact on behavioral intention at (β) of 0.296 (t-value = 3.951***), then, behavioral intention on use behavior at (β) of 0.278 (t-value = 3.619***).

Table 5: Hypothesis Results of the Structural Equation Modeling

Hypothesis	(β)	S.E.	t-value	Result
H1: PEOU→BI	0.393	0.063	5.677***	Supported
H2: PU→BI	0.296	0.061	3.951***	Supported
H3: BI→UB	0.278	0.075	3.619***	Supported

Note: *** p<0.001, ** p<0.01, * p<0.05
Source: Wang et al. (2023)

H1 confirms that perceived ease of use is one of the strongest factors of behavioral intention, with a standardized path coefficient value of 0.393 in the structural pathway. The assumption is that students in computer science programs at the College of Chengdu Neusoft University and the School of information and business management are more likely to admit having notebook computer brands for their study, learning, doing workshops and projects rather than using computers provided by the college laboratory (Roschelle et al., 2005).

H2 clarifies that the relationship between perceived usefulness and behavioral intention is supported, with a standardized coefficient value of 0.296. Perceived usefulness identifies the students in computer science programs at the College of Chengdu Neusoft University and the School of information and business management anticipating that obtained notebook computer brands for their study to enhance their learning performance (Tschang & Xue, 2005; Bian, 2005).

H3 reveals that behavioral intention significantly impacts use behavior, with a standard coefficient value of 0.278. Krekel et al. (2014) and Dong (2022) found that when students can easily use innovative technology, they tend to have a behavioral intention for creative learning activities.

6. Conclusions and Recommendation

6.1. Conclusion

The purpose of this study was to identify the factors that influence the notebook computer brand purchasing intention and use behavior of computer science majoring college students in Chengdu, Sichuan, China. A conceptual framework was provided for the presentation of the hypotheses. There was a total of 878 undergraduate students with experience in using different notebook computer brands who responded to the questionnaire. A structural equation model (SEM) was used to validate the hypothesized factors that significantly impact behavioral intention and use behavior. Statistical analyses were carried out through confirmatory factor analysis (CFA) to check the validity and reliability, and a structural equation model (SEM) was used to validate the factors.

The obtained findings pointed to the factors that impact the students' choice for various notebook computer brands. The perceived ease of use has the most significant and biggest influence on the individual's purchasing intention. The participating students tended to use notebook computer brands perceived as user-friendly and beneficial to their study (Roschelle et al., 2005). The significant association between perceived usefulness and behavioral intention indicates that the students' use of certain notebook computer brands would help them improve

their learning performance. This was found earlier by previous researchers (Tschang & Xue, 2005; Bian, 2005). It was confirmed in this study that behavioral intention has a substantial impact on use behavior for the students enrolled in computer science programs because they anticipate their brand choice of notebook computers to make their lives easier in their study as well as projects (Krekel et al., 2014; Dong, 2022).

6.2 Recommendation

In this study, the researchers identified the major factors that impact notebook computer brand choice intention and use behavior of college students majoring in computer science in Chengdu, Sichuan, China. The results on notebook computer brand choice are to guide students in computer science programs to select a tool to reach their desirable learning outcomes. Notebook brand companies, and universities in computer science programs, should be aware of brand preferences among computer science students and those in related fields regarding notebook technical specifications relevant to computer science programs. Thus, students' behavioral intentions can help improve their learning outcomes and performances.

The computer science programs could support students with new information technology, and suggestions on notebook computers suitable for practical and active learning skills. These can encourage students' interests and desire for a good learning outcome on the target competencies and skills needed in the technology market. The point on perceived ease of use as the strongest impact on behavioral intention could help brand companies to produce suitable notebook systems that are user-friendly and universities could plan for the hardware specification list known to all stakeholders. The hardware specification lists can also help students to be flexible in their choice of specific notebook computer brands.

Perceived usefulness has a significant impact on behavioral intention, and behavioral intention has a significant impact on use behavior. Such obtained findings could support universities to recommended suitable notebook computer brands with all technical specifications pertinent to the target learning outcomes and performances. A survey could be conducted with students for their feedback on learning improvements from the ease of use of the selected brands. As for product feedback from consumers, both teaching programs and notebook brand companies should update, recommend, and customize hardware specifications in support of computer science courses and students' efficient learning.

6.3 Limitation and Further Study

The researchers of this study were well aware of drawbacks in sampling and the scope of a case study. The participants were restricted to those graduates in Computer Science at Chengdu Neusoft University's College of Chengdu and the School of Information and Business Management in China. As a result, the obtained findings can be confined to computer science students in Chengdu, but not generalized to other local or international contexts in China. This case study was a pioneering effort on consumer-based product marketing and the researchers hope that future research should cover larger provincial groups and a national scope of the

study. Other potential factors, such as levels of trust, perceived interaction, performance expectations, and the conditions of facilitation could also be considered for inclusion in pursuing future research from both quantitative and qualitative perspectives.

7. The Authors

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ISSN 2821-9074 (Online)
ISSN 2730-2601 (Print)
RICE Journal of Creative Entrepreneurship and Management, Vol. 4, No.2, pp. 16-32,
May-August 2023

doi: 10.14456/rjcm.2023.8
Received 30.11.22/ Revised 25.07.23/ Accepted 15.08.23

The Causal Factors for Entrepreneurial Intention among Students in Business Administration at Two Private Universities in Nong Khaem District, Bangkok

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Abstract

The objectives of this research were (1) to study the causal factors for entrepreneurial intention among fourth-year business administration students at the bachelor's degree level at two private universities in Nong Khaem District, Bangkok; and (2) to identify the relationship of causal factors to entrepreneurial intention of students with different personal factors. The participants came from the business administration programs at two private universities in Nong Khaem District, Bangkok. Two hundred and fifty-six students were selected by a two-stage sampling method and simplified sampling to re-examine the causal model and analyze the results using the SPSS program. The results from the questionnaire response data analysis showed that all factors were averaged at a high level. The analyzed model was of business administration students at private universities in Nong Khaem District, Bangkok at the bachelor's degree fourth-year level. The researchers set a statistical value at the level of 0.05 for the factor affecting the intention to be an entrepreneur. It was found that the participating students in business administration with different backgrounds revealed the statistically significant relationship of causal factors to their entrepreneurial intention.

Keywords: *Person, personality traits, entrepreneurial attitude, social norms, behavior control perception, entrepreneurship education, entrepreneurial intention*

1. Introduction and Rationale of the Study

The current state of creativity and innovation plays a role and impacts operations in all sectors. Government organizations and the private sector must face the intense competition among businesses around the world. Therefore, it is necessary to find a way to operate in order to survive and to ensure outstanding performance compared to other organizations. Knowledge and globalization are the driving forces, of the country's economy and of the world, to keep up with challenging changes. Entrepreneurial economy (Entrepreneurial Economics) can create creativity and innovation (Yu, Khalid & Ahmed, 2021) (Proprietorship), partnership (Partnership) and company (Corporation). Entrepreneurs play an important role in growth and economic development of the country, creating employment, better quality of life, improving people's living in society, and reducing poverty.

Entrepreneurship is a driving force for Thailand's economic growth, job creation, and social adaptation from the Covid-19 pandemic that affects the economy and society at

large. Large businesses have to slow down, stop, or a large number of businesses close, resulting in knowledgeable and experienced personnel, new graduates, and workers having lost their job or work opportunities--leading to social problems from unemployment (Sakorn, 2019). This situation has prompted people still working full time in government or private organizations feel rather insecure and look for a second career. They need additional income in different career options. As seen, there are more entrepreneurs in medium-sized businesses in the current Thai economic system (Wongklad, 2018).

In the past, most higher education institutions played a vital role in the development of human resources for the country in producing graduates to meet the demands of the labor market in different professional fields. Currently, higher education institutions have been teaching entrepreneurship and business ownership in the Bachelor of Business Administration program, and the demand has grown a lot for a master's degree in Business Administration/ Management with emphasis on innovation and entrepreneurship. Potential entrepreneurs need courses in accordance with market demands for private business operations. A private business can have a variety of operating modes, such as being a manufacturing business, service business, trading business and brokerage business. A good entrepreneur needs sufficient capital and resources, as well as business skills. At present, universities in Thailand and abroad have many teaching and learning programs on entrepreneurship, and aim at providing students with knowledge and entrepreneurial skills to be able to develop their own business to grow well with sustainable performance.

2. Objectives of Research

(1) To identify the causal factors for entrepreneurial intentions of business administration students at the bachelor's degree level in their fourth year at two private universities in Nong Khaem District, Bangkok.

(2) To identify the causal factors for entrepreneurial intentions of the participating students on the basis of their personal factors.

3. Research Hypotheses

(1) Students with different personal factors have different causal factors for entrepreneurial intentions.

(2) Students with different personal factors have different entrepreneurial intentions in becoming entrepreneurs.

4. Scope of Research

(1) The scope of the study was confined to the causal factors for entrepreneurial intentions of business administration students.

(2) The population used in this research was confined to full-time business administration students at the bachelor's degree level in their fourth year at two private university in Nong Khaem District Bangkok.

(3) The data collection period was between December 2021 and June 2022.

5. Definition of Terminology

The researchers defined eight terms used in the study as follows:

(1) Entrepreneurship means a person's creativity in finding opportunities, able to take that opportunity to use in business and keep supporting the business under various risks and problems to provide commercial returns to operators.

(2) Personal Characteristic (PC) refers to the personal characteristics of students in this research: gender, age, ethnicity, family background.

(3) Personality Traits (PT) refers to behaviors that can be expressed physically, mentally, and emotionally, that reflect to others who are impressed. Therefore, a person will be respected, supported, trusted, and impressed by others. A person should show a good personality and appropriate social manners toward others, because personality greatly influences the feelings and emotions of those who see it.

(4) Attitude (AT) refers to the feeling one has about one or more things in a subjective manner which is fundamental, or an expression known as behavior.

(5) Social norms (Subjective Norms: SN) refers to the expected behavioral patterns of society. It is a standard that members of society are expected to follow. Therefore, it is generally accepted in various societies that consist of groups of people and many individuals at each age level, people associated with a number of people, most of whom they do not know personally.

(6) Perceived Behavioral Control (PB) refers to the ability to make decisions under pressure. This ability deals with feelings, thoughts, desires for competition, commitment, business effort, a need to create an advantage and to outperform competitors in business competition, and opportunities for leading oneself to success with self-confidence in various tasks.

(7) Education to Entrepreneurship (EE) means self-education to know that you are ready to go into business with the aim on a profit, a forward move to operate the business with the possibility and vision of continuing that business for a certain period of time.

(8) Willingness to be an entrepreneur: Entrepreneurship Intention (EI) refers to the person's awareness and confidence that they are likely to create an activity and plan to do it in the future. This is because changing intentions is an important variable that affects future behaviors by inventing new innovations and turning those opportunities into successful businesses for an advantage in the long run.

6. Related Literature

In this research, the researcher studied concepts, theories, and related research on Personal Characteristics (PC), Personality Traits (PT), Attitude Factors (AT), Social Norm Factors (Subjective Norms: SN), Perceived Behavioral Control (PB) Factors, Education to Entrepreneurship (EE) Factors, and Entrepreneurial Intent Factors. (Entrepreneurship Intention: EI)

Personal Characteristic (PC) is the market segmentation based on personal characteristic variables consisting of gender, status, age, family, number of family members, education level, occupation, and monthly income (Sereerat, 2009). Personal factor characteristics are important characteristics and measurable statistics of the population and help in determining the target market, while psychological and social

characteristics and culture help to explain the thoughts and feelings of a particular target audience. Demographic information is accessible and effective in targeting markets. People with different demographics have different psychological characteristics. In terms of marketing, the personal factor has various elements that are important (Kotler, 2000): (1) Gender: A variable that is very important in terms of behavior in consumption because of the differences between sexes related to attitudes, perceptions, and decision-making regarding the selection of goods to consume. (2) Age: Individuals of different ages demand different products and services. (3) Marital status: The status of various individuals related to marriage--being single, widowed or divorced. (4) Education: The level of education is an intermediary or a measure of opinion or attitude as a level of thinking of consumers. (5) Occupation: An individual's occupation will lead to necessity and product demand. (6) Income as economic status or economic circumstances: The level of income is an expression of the level of a person's economic status that affects the choice of brand and service. (7) Family size: It is an important factor in the study of personal qualifications. (8) Residence location: It varies with product use and services that are designed to fit and consistent with the various residences (Belch & Belch, 2005).

Personality Traits (PT): Personality is social attractiveness. A person with a personality that impresses others will influence good interpersonal relationships. In terms of work, personality traits affect job satisfaction and job success, understanding of the feelings of others, and desire for a warm and compromising attitude. An accountant should have the characteristics of being meticulous and following work steps (Schulz & Schulz, 1998). The components of the personality traits were used as one of the variables influencing work adaptation. The composition of personality was categorized by Costa & McCrae, (1985, cited in Howard and Howard, 2004) as follows: (1) Sensitive personality: Neuroticism refers to the degree to which a person responds to stress. Characteristics of a person's response to stimuli will react in a way that is alert, anxious, considerate, or in a way that is easily exhilarating. Therefore, some people are more likely to experience stress at work than others. (2) Extraversion refers to the degree to which a person is able to tolerate stimuli from people and situations where a person with a high-profile character will like to share with others and likes to do activities. (3) Openness refers to the degree to which a person is open to new experiences, or new methods in doing things, A person with a highly open personality tends to have a wide range of interests and a passion for technology as much as with strategic thinking. (4) Compromise personality: Agreeableness refers to the degree to which a person is more likely to have a relationship with another person in a way with patience and the satisfaction and acceptance of others. Individuals with compromising personalities tend to relate to others in an expressive, stubborn, cautious, insistent, competitive, and aggressive manner without inspection and may appear to others in a hostile, rude, self-centered, and individualistic manner. (5) Conscientious personality: Conscientiousness refers to the degree to which a person puts effort toward a goal. A person with a highly conscientious personality is a person who tends to work diligently toward the goal. Disciplined and reliable individuals with a low conscientious personality tend to be able to perform a wide variety of tasks and are often associated with multiple projects and goals at the same time.

Attitude Factor (AT): A a good entrepreneurial attitude is defined as having a good conceptual framework and feeling of love and enjoyment of a legitimate high-level or low-level occupation, good morals or customs, and being accepted by society although the honest occupation will receive a return that is not very high in some occupations. A good attitude is of great importance in human life especially concerning honest occupation. A positive attitude toward work results in the success of the assigned tasks where a person does not feel difficult or bored at work, but happy with the work assigned every time. And the effect of having a good attitude toward work will enhance the progress of an honest occupation enabling a person to live happily in society (Prasitratasin & Sukkasem, 2004). Benefits are derived from a good entrepreneurial attitude and honest occupation with good attitude will yield good results (Prasitratasin, 2004) as follows: (1) Lead to sustainable progress in honest occupation by earning income and security in life. (2) Help a person to understand the work system and workload. (3) Demonstrate the value of each person in honest occupation. (4) Help human beings to adapt to society and be able to work together effectively. (5) Help to foster a positive attitude in group work and the power of unity.

Metrics of Good Entrepreneurial Attitude: An indicator of attitude is a requirement, rule, or behavior that indicates how we feel about something--good feelings, such as love, likes, admiration, faith in the profession, or bad feelings, such as dislike, working in our career out of necessity and heart. Good attitudes to work for an honest occupation (Prasitratasin, 2004) are as follows: (1) Integrity: It is an important virtue that everyone should uphold as a regular and practiced virtue. It is a conspicuous demonstration of honesty. (2) Responsibility: Responsible for work, do not mind heavy work, light work, always working, and having good time management at work. (3) Punctuality: It is a fundamental responsibility of every human being--starting from coming to work on time, finish work at the time specified by the organization, take the time to work fully, and complete the assigned tasks as required. (4) Diligence and patience: In working life, there must be both successes and obstacles. (5) Creativity in work: Various honest professionals must be creative in their own career for career development, make steady progress, and compete to win. (6) Intention, determination and effort: To work professionally, one must pay attention to the work done or assigned, know planning, and intend to work to the best of their ability. (7) Cooperation: In team-working, a person must be considerate to co-workers. Teamwork requires thinking, planning, and clearly dividing work duties. (8) Performance improvement: Success in work life and career will occur and must be improved steadily. A person needs to have work capacity to be able to move to a higher level. (9) Good manners: Good social manners at work and respect others.

Social norm factors (Subjective Norms: SN) are social rules in various ways that can be brought to create respect for the coexistence of people in society and the community by recognizing meaning, importance, and function of norms in the creation of social control, methods of control, and various forms of control, such as the way of civilization, customs, laws, rules of coexistence, and ordering in human society. When society is orderly, the society will have lasting peace and the members of society will be able to live their own lives. Every society needs a social order for humans to survive. All societies have similar social arrangements in principle but differ in detail. When social norms are established, it is necessary to encourage members of society to comply with those norms.

Society also creates other rules to support other norms, such as value systems, social beliefs, ideologies, symbolic systems, and social institutions, such as status and role. Social norms are phenomena that are tied to status which is closely related to the role. Another important topic of social organization is social stratification.

As for social norms, Bierstea (1950) listed 14 types of norms as traditions. Included are taboos, fashion, fads, ceremonies, rituals, social etiquette, rules, regulations, laws, civilizations, customs, statutes and agreements or conventions. Considering social norms as conventions in general, most sociologists put social norms in three categories: civil, custom, and law. These can be classified into three major categories as follows: (1) People's way or folk way in facing many problems which they are trying to solve for living--in a pattern unique to each society. This may be due to discovery informally and seeing that this is good and suitable for use in their own society for acceptance and practice. (2) Mores are the standards set up to remind individuals and groups of what behavior is right and what is wrong. A person knows what to do and society knows how to punish if one does not comply. It is a necessity to act as expected for the welfare of the society. (3) Laws: A law is the norm that arises deliberately. It may come from the way of the people and the customs. As known, if someone does not abide by the law, that person will be punished. When laws are applied to maintain order by these assumptions, power must be taken into account. The duty of righteousness that can be performed or properly acted simultaneously should be by a variety of norms supporting each other in order to create a sustainable social order.

Perceived Behavioral Control (PB) is the perception of the ease or difficulty of one's behavior in performing that behavior, including the ability to control the behavior as intended. If a person has the belief that he/she can behave by being able to control the outcome intentionally, that individual is more likely to exhibit that type of behaviors. But if a person believes that a particular action is not able to control the result as intended, the tendency to exhibit that type of behaviors is reduced. One’s beliefs of control tend to deal with existence or lack of the resources or opportunities necessary to engage in faith-based behavior about gaining control as done in the past behavioral experiences, and will result in a person's decision. When a person is faced with an unexpected situation or a situation that occurs suddenly, other people may persuade a person to act out by social norms (Ajzen, 1988). *Perceived controllability* is the belief about behavior that depends on the doer of the behavior. Beliefs in one's abilities are beliefs that are reflected by intrinsic factors (Ajzen, 1991). Beliefs were categorized into three categories: (1) behavioral beliefs that influence attitudes toward behavior as beliefs related to the consequences of actions. If a person believes that behavior will lead to positive result, he will have a positive attitude toward that behavior, while the person who believes that the behavior will lead to negative result will not. (2) Normative beliefs, which determine reference conformity, are beliefs that a specific person or group thinks they should or should not perform that behavior. On the other hand, if an individual believes that other people who are important to him think that he should not perform the behavior, he will not. (3) Control beliefs underlying cognitive behavioral control are beliefs about the presence or absence of resources. For the basis of emotions and feelings, human behavior patterns can be divided into two types (Phoomphatthakom, 1997): (1) Overt behavior as the behavior that a person expresses to cause others to see and observe, such as walking, laughing, talking, smiling. (2) Intrinsic

behavior or covert behavior as the behavior that the person has already exhibited, but others cannot see or notice it directly. A person tends not to tell or show something to others, such as thoughts, emotions, and perceptions.

Education to Entrepreneurship (EE) Factors: Good entrepreneurs should have the qualifications of responsibility for work to meet the needs of consumers in a fair manner. They need to have ethics and business ethics to be accepted by the society and able to operate business stably. Characteristics of a good entrepreneur (Bachnik & Samolej, 2018) are: (1) Willingness to succeed by investing and reinvesting. Good entrepreneurs have to work hard, almost no days off, because they have to plan, decide, implement and solve problems all the time. These characteristics require strong family support. (2) Self-confidence: Self-confident people have high self-esteem and are not afraid to fight against problems and obstacles, thus having a high chance of achieving the goals set forth. This feature will enable those who work with them or others to have confidence as well. (3) Having a clear business idea: Entrepreneurs must know what business they are in, and what their product or service is. They need to be aware of their strength and weakness when faced with their competitors. (4) Having a systematic plan (a business plan): Having only good business ideas does not guarantee that entrepreneurs will be successful (Khanthapa, 2020), but a systematic roadmap known as a business plan could help. (5) Exact control of finances: Many entrepreneurs successfully build themselves up through specialized skills and innovative production. (6) Have the ability to market (targeted marketing) in a specific era of competition: Marketing competence is an important skill that enables businesses to survive (Khanthanapha, 1972). (7) A step ahead of the competition: A good entrepreneur must be able to predict accurately the market and competitive conditions. (8) Have a good source of support (management support): Successful entrepreneurs are often people who know their networks, and various sources of support that affect their business. (9) Have the skills to coordinate (cooperation): Sharpen the skills to coordinate both within the business and outside including having good human relations, communication skills, commanding, and creative leadership. (10) Having an appropriate organization (clear company structure): Having a clear, uncomplicated chain of command, suitable for the size of business that can be adjusted periodically as the organization grows (Bachnik & Samolej, 2018). All these ten features have a direct impact on the production and operations, marketing, and costs of an entity.

Although the decision to choose a location does not occur often, each type of business has different characteristics, strategies and goals. And the methods entrepreneurs use to decide the location vary because the decision will affect the ability to make profit and exploit competitive advantage. Therefore, entrepreneurs need to be careful in choosing the location of the business. *Location* is important to the production of the organization's operations. Site selection is essential in the process of studying and analyzing the data to define the places where the business can operate with convenience and efficiency by considering costs, revenues, relationships with personnel, customers, and suppliers of raw materials as well as the operating environment in the type of business. There are many types of operations that can be carried out, including the nature of business operations. They can be classified as a manufacturing business, distribution and service, or categorized according to the nature of ownership in the form of partnerships, companies, cooperatives,

state enterprises and business operations as franchises; businesses can be classified as small, medium or large; each type of business operations has different characteristics in its establishment. In choosing any type of business, the entrepreneur must consider knowledge, ability, and readiness of each operator, but most importantly, it must be consistent with the ability to meet market demands in particular locations.

Factors of Intention to become an entrepreneur: (Entrepreneurship Intention: EI): EI is a characteristic of successful entrepreneurs. Anyone who wants to run one's own business needs to have an entrepreneurial instinct and always be eager to find a golden channel for business investment. To be an entrepreneur is necessary to overcome any obstacles that will happen, with the determination to succeed, be patient, continue to work hard and be committed to the work to achieve success. Such characteristics are as follows: (1) Risk Taking "Business" and "Risk" belongs to the entrepreneur who works with challenging knowledge and own abilities. (2) Wanting to focus on success (need for achievement) when seeing opportunities with careful consideration (Fishbein & Aizen, 2015). Entrepreneurs will strive to use the energy of thinking and intelligence, and all abilities, work hard and devote to work (Wang, Yuen, Wong & Li, 2020) in order to achieve success through appropriate channels. (3) Creative Thinking: Be innovative, apply past experiences to create new and better methods for business administration, assess the problem and find a practical solution. A good entrepreneur needs to find a way to develop a product or service and improve operational processes all the time. (4) Know how to commit to goals (addict to goals) and imagine success and what to do if it fails and how to fix it. (5) The ability to convince others (ability to motivate): Have the ability to convince others to cooperate to help in the work, know how to use the ability to work, build positive attitude and motivation. (6) Stand up to hard work: Work to the best of your ability, even if faced with problems and obstacles. (7) Take past experiences as lessons (learning from experience): Identify problems and lessons to apply to tasks or improve and change it to a good success. (8) Have the ability to manage and have good leadership (management and leadership capability): Have leadership characteristics and know the principles of good management. (9) Have self-confidence (be self-confident): Have confidence in their own abilities, be independent, self-reliant, confident, determined, resolute and strong as a leader (Phan, 2002). (10) Visionary: Experienced to accurately analyze future events and be ready for any changes. (11). Responsibility: Responsible for the work done well. Being a leader in doing things, an entrepreneur often takes an initiative in doing things by himself or assign others to take care until the work is accomplished according to the goals set. (12) Enthusiastic and does not stop to work full of energy: Lively enthusiasm that is hard to resist. (13) Pursuing more knowledge: Take new knowledge to help analyze changing situations. Knowledge never ends and can be gained from training seminars and reading books to increases knowledge. (14) Can make decisions and attempt: Dare to make decisions with firmness and courage. A good entrepreneur needs to believe in himself for getting the work done (Crant, 1966) (15). Independent: Entrepreneurs who are just starting their business often use leadership as their authority only to find out that they need to push those subordinates around to get the job done to attain success. (16) Focus on current situation: Entrepreneurs must do their best in the present time and thinking about the future through careful planning. (17) Adaptable: Need to believe in one's ability to adapt to the needs of

the environment. (18) Be self-sufficient (self-assessment): Do something self-sufficiently, not beyond the ability.

7. Research Methodology

The researchers used a causal model by obtaining response data from the questionnaire for *primary variables* with latent factors in personal factors, social personality trait factors, entrepreneurial attitude factors, social norm factors, cognitive factors to control behavior, and educational factors for entrepreneurship that affect *the dependent variable* in the entrepreneurial intention factors.

The participants came from the business administration programs at two private universities in Nong Khaem District, Bangkok. Two hundred and fifty-six students were selected by a two-stage sampling method and simplified sampling to re-examine the causal model and analyze the results using the SPSS program.

8. Summary of Research Results

The results of the research can be summarized as follows:

The respondents were 256 fourth-year students of the Faculty of Business Administration in two private universities in Bangkok.

Gender: Female = 168 (65.60%); Male = 88 (34.40%)

Age: 25-27 years = 192 (75.00%); 28-30 = 59 (23.00%)

Major: Marketing = 48 (18.75%); Accounting = 43 (16.80%);
Digital marketing = 40 (15.63%); Management = 40 (15.63%);
Digital Business Computer = 24 (9.38%);
Digital Business Information Systems = 23 (8.98%);
Commercial Innovation Management = 20 (7.81%)
Human Resource Management = 18 (7.03%)

Table 1 shows that the causal factors affecting the intention to become an entrepreneur of the business administration students: Entrepreneurship ($\bar{x}$ =4.02, SD = 0.49), followed by educational management to entrepreneurship factor ($\bar{x}$ =4.00, S.D = 0.61), personality factor and social norm factor ($\bar{x}$ = 3.84, SD = 0.51 and $\bar{x}$ =3.84, S.D = 0.69), respectively.

Table 1: Mean and Standard Deviation of Opinions Regarding the Causal Factors for Entrepreneurial Intentions of the Participating Students in Business Administration

Intention to become entrepreneur	$\bar{x}$	S.D.	Comment Level
Personality Factor (PT)	3.84	0.51	a lot
Entrepreneurial Attitude Factors (AT)	4.02	0.49	a lot
Social Norm Factor (SN)	3.84	0.69	a lot
Factors in Educational Management to Entrepreneurship (EE)	4.00	0.61	a lot
Behavioral Control Cognitive Factors (PB)	3.78	0.68	a lot

Table 2 presents the correlation coefficient between personality trait factors: The Attitude Factors for an entrepreneur's social norm factor. Factors of perception of ability to control behavior, and Factors of educational management toward entrepreneurship and Intention to become entrepreneurs of students in business administration.

Table 2: The Correlation Coefficient between Personality Trait Factors. (n = 256)

Factor	PT	AT	SN	PB	EE	EI
Personality Traits: PT	1	0.678**	0.551**	0.557**	0.391**	0.504**
Attitude: AT	0.678**	1	0.496**	0.605**	0.500**	0.602**
Subjective Norms: SN	0.551**	0.496**	1	0.578**	0.240**	0.397**
Perceived Behavioral Control: PB	0.557**	0.605**	0.578**	1	0.469**	0.565**
Education to Entrepreneurship: EE	0.391**	0.500**	0.240**	0.469**	1	0.532**
Entrepreneurship Intention: EI	0.504**	0.602**	0.397**	0.565**	0.532**	1

** Statistically significant at the .01 level

* Statistically significant at the .05 level

Table 2 reports personality trait factors (PT), attitude factors (PT), entrepreneurship factor, social norm factor (SN), perceived control factor, behavior (PB) and behavioral factor (PB). The entrepreneurship (EE)factor was statistically correlated with the intention to become entrepreneurs of the participating students at the level of 0.01. For all factors by personality trait factors (PT). = 0.504), entrepreneurial attitude factor (AT = 0.602), behavioral control cognition factor (PB = 0.565), and educational management to entrepreneurship factor (EE = 0.532), and the intent (EI) to become entrepreneurs of the business administration students was highly correlated (PT = 0.504, AT = 0.602, PB = 0.565, EE = 0.532, SN = 0.397, respectively). It should be noted that the factor of intent to become an entrepreneur of the business administration (EI) students were at low correlation (EI = 0.168).

The correlation of causal factors to entrepreneurial intentions of business administration students was that personality trait factors influenced causal factors for entrepreneurial intentions of business administration students. The opinion level was at a high level ($\bar{X}$ = 3.84, S.D = 0.51). The personality trait factors affecting entrepreneurial intentions were innovative ability ($\bar{X}$=4.04, S.D =0.76), creativity ($\bar{X}$=3.99, S.D =0.76) and self-confidence ($\bar{X}$ = 3.96, S.D = 0.71).

The correlation of factors affecting the causal factors for entrepreneurial intentions of business administration students regarding their opinions was at a high level ($\bar{X}$ = 4.02, S.D = 0.49). The factors of entrepreneurial attitude affecting the causal factor for the entrepreneurial intention of business administration students were preferring to be entrepreneurs rather than being employees in large companies/organizations ($\bar{X}$= 4.36, S.D = 0.70), to be an entrepreneur in a self-established business rather than a manager in an existing company ($\bar{X}$= 4.15, S.D = 0.71), and to be an entrepreneur contributing to the stability of the country's economy and society ($\bar{X}$=4.11, S.D = 0.75).

The causal factors for entrepreneurial intentions of business administration students focused on social normative factors affecting students' entrepreneurial intentions regarding their opinion at a high level ($\bar{X}$ = 3.84, S.D = 0.69). The social normative factors affecting the causal factors for entrepreneurial intentions of business administration students were family and peer support in starting their own business ($\bar{X}$ = 3.95, S.D = 0.81), being an entrepreneur supported by the family ($\bar{X}$ = 3.93, S.D = 0.77), and peers' support ($\bar{X}$ = 3.65, S.D = 0.91).

The causal factors for entrepreneurial intention of business administration students were cognitive factors, behavior control ability and influence on student's willingness to become entrepreneurs regarding their opinion at a high level ($\bar{X}$ = 3.78, S.D = 0.68). The

researchers found the first three in order: Confidence in success if starting your own business ($\bar{X}$=3.88, S.D = 0.77), Starting your own business is easy ($\bar{X}$=3.84, SD=0.79), and Starting a business in one's own as the best way to take advantage of education ($\bar{X}$ = 3.82, SD = 0.77).

The causal factors for entrepreneurial intention of business administration students were factors in education toward entrepreneurship regarding their opinion level at a high level ($\bar{X}$ = 4.00, SD = 0.61). The area of knowledge that should be presented in the entrepreneurial education course should be developed in the order: Knowledge of the entrepreneurial environment ($\bar{X}$ = 4.11, SD = 0.76), Increased acceptance of entrepreneurial image ($\bar{X}$ = 4.00, SD = 0.74), and Competence required for entrepreneurship ($\bar{X}$ = 3.99, SD = 0.69).

Of the 256 respondents, 216 (84.40%) studied about entrepreneurship to create new businesses, and 40 (15.60%) never studied about entrepreneurship to create a new business.

The researchers also found that the factors affecting entrepreneurial intention of business administration students having studied about entrepreneurship to create a new business: Factors in education toward entrepreneurship affecting students' intention to become entrepreneurs regarding their opinion were at a moderate level ($\bar{X}$ = 3.50, SD = 1.58). The extent of knowledge that should be in the course of study to create entrepreneurs was found in an order: first, the knowledge of the entrepreneurial environment ($\bar{X}$ = 3.55, SD = 1.65) with the opinion level at a high level; second, the recognition of the image ($\bar{X}$ = 3.53, S.D = 1.65); and third, the competence required for entrepreneurship ($\bar{X}$ = 3.46, S.D = 1.61) which was rather moderate.

The causal factors affecting entrepreneurial intentions of business administration students were at the level in the intention to become entrepreneurs ($\bar{X}$ = 3.99, SD = 0.58). All opinions on entrepreneurial intentions were at a high level in an order: first, the readiness to do things to become an entrepreneur ($\bar{X}$ = 4.14, SD = 0.73); second, a career goal on becoming an entrepreneur. ($\bar{X}$=4.05, SD=0.73); and third, effort to start and run their own business ($\bar{X}$=4.04, SD=0.72).

Table 3: The Results of a Procedural Multiple Regression Analysis of the Relationship of Factors Affecting Entrepreneurial Intention of Business Administration Students

forecast variable	R	R^2	Adjusted R^2	b	S.E.est	β	t	Sig
The Entrepreneurial Attitude Factors (AT)	0.602	0.362	0.359	0.379	0.071	0.324	5.361**	0.000
Factors in Educational Management to Entrepreneurship (EE)	0.658	.433	0.429	0.237	0.051	0.252	4.322**	0.000
Behavioral Control Cognitive Factors (PB)	0.686	0.470	0.434	0.213	0.051	0.250	4.207**	0.000
Constant (a) = 0.711 S.E.est = 0.42120								

** Statistically significant at the .01 level

Table 3 reports the entrepreneurial attitude factor (AT), the Education Entrepreneurship (EE) and the Cognitive Factors (PB) as predicting the entrepreneurial intention of the business administration (EI) students statistically significant at the 0.1 level, where the

three variables predicted 47 percent of the entrepreneurial intent, with the standard forecast error (S.E.est) at 0.42120.

9. Discussion of Results

Research findings on the entrepreneurial intentions of business administration students were discussed by factors as follows:

Personality Traits Factors Affecting Entrepreneurial Intent of Business Administration Students: Their opinion level was at a high level ($\bar{X}$ = 3.84, SD = 0.51), which corresponds to the earlier result reported by Smithikrai (2005) who found that the relationship of factors affecting entrepreneurial intentions of business administration students was at a high level. Hongphaisanwiwat (1996) who studied the characteristics of entrepreneurs in the manufacturing business, distribution and service also found that entrepreneurs in different types of businesses show similar characteristics of entrepreneurs in six aspects in a descending order: (1) ability to see business opportunities, (2) achievement motivation, (3) leadership, (4) economic rationality, and (6) confidence. This point was consistent with the research finding on personality for success of small businesses by Levinson, Hancock & Fishman (2008). Personality traits for success included patience, aggression, being thoughtful and imaginative, wit and sensitivity to the surrounding environment, sensitivity and ego strength (Galbreath, Lucianetti, Thomas & Tisch, 2020) The Hutt study (1994) and Peng (2018) suggested the attributes of entrepreneurship in two aspects, namely risk taking and proactive action. The study by Busenitz, et al., (2003) proposed three areas of entrepreneurship in innovation capability: Innovativeness, Proactiveness, and Risk Taking. Gielnik et al. (2002) outlined six attributes of entrepreneurship: autonomy, economic competence, innovativeness, risk taking, competitive aggressiveness, stability and learning, and a passion for success. Similar research findings were also reported by Linan & Fayolle (2015) regarding the characteristics of entrepreneurs in five aspects: Autonomy, Innovativeness, Risk-Taking, Proactiveness, and Competitive Aggressiveness.

The attitude toward entrepreneurship factors influenced the students' intention to become entrepreneurs. Their opinion was at a high level ($\bar{X}$ = 4.02, S.D = 0.49), which was consistent with the study by Chancharoensuk (1999) who studied the attitude toward being entrepreneurs of the School of Business Administration students at Rajamangala Institute of Technology Payap Campus. The study reported that the sample group had a positive attitude toward entrepreneurship, but after graduation, only 20.7% of students have become entrepreneurs. Scott & Twomey (1988, cited in Smithtikrai, 2004) found that parental influence and work experience played an important role in raising students' perceptions about doing business, and their attitude toward entrepreneurship. Blackburn & Smallbone (2008) reported similar results in that people desiring to run their own business are often those who come from families where their parents have their own businesses.

The subjective norm factors affect the students' intention to be entrepreneurs at a high level ($\bar{X}$ = 3.84, SD = 0.69). The finding was consistent with the result reported Corman, Benjamin, & Paula, (1988). If a person's job can meet his needs or expectations, he will feel satisfied with the job. Therefore, expectations impact a person's decision-making. In Thailand, families are known to influence the individual decision-making and gain support from family members and networks (Smithikrai, 2004).

The perceived behavioral control factors affect the students' entrepreneurial intention at a high level ($\bar{X}$ = 3.78, S.D = 0.68). This finding was consistent with the study of Bandura (2019) in that self-belief is a mechanism for controlling the actions of a person. Those who do not believe in themselves will try to escape from work or work with stress and anxiety when faced with obstacles.

The factors in education to entrepreneurship affect the students' willingness to become entrepreneurs at a high level ($\bar{X}$ = 4.00, SD = 0.61). Such a result was reported earlier by Parnell, Crandall & Menefee (1995) who found that American students were more likely to start their own businesses after graduating than Egyptian students, because of different education systems. Martz, Neil, Biscaccianti & Williams (2007) confirmed such research finding in their study with students from the United States, the United Kingdom and France and found that American students have more desire and willingness to devote their time to become entrepreneurs. Mason (2011) found an upward trend in entrepreneurial production and entrepreneurship training in countries, such as China, South Africa, Ireland, and Malaysia, in education and training of entrepreneurs. Nnditshen & Muofhe (2011) found that students who studied entrepreneurship had more intentions to become entrepreneurs than those who did not study entrepreneurship. In this regard, entrepreneurship education and the entrepreneurial model account for students' intention to be an entrepreneur and pursue a business career.

The causal factors for the business administration students' intention to become entrepreneurs of the business administration students were at a high level ($\bar{X}$ = 3.99, S.D = 0.58), consistent with the study of Ajzen's Theory of Planned Behavior (1985). The factors affecting the intention to be an entrepreneur hold three variables or components of intention: (1) Attitude toward Behavior--how a person feels about an action and including the consequences that will occur. (2) Social Norms--the perception that other people who are important have influence. (3) Perceived Behavioral Control--how much a person perceives himself to have ability to control the action.

The factors related to willingness to become entrepreneurs were in four that were highly correlated: (1) Personality Characteristics Factor, (2) Entrepreneurial Attitude Factors, (3) Cognitive Factors for Behavioral Control, and (4) Factors in Educational Management to Entrepreneurship--all can predict a person's intention to become an entrepreneur.

In this study the researchers were able to confirm the predictive power of Entrepreneurial Attitude Factor (AT), Factor in Educational Management, Entrepreneurship (EE), and Cognitive Behavioral Control (PB) factors as statistically predictive of entrepreneurial intent among the business administration (EI) students under study. Two earlier local studies helped confirm such finding: (1) Phan (2002) studied undergraduate and postgraduate 13,014 students enrolled in universities across Asia and found Attitudes as highly predictive of entrepreneurial intentions. (2) Smithikrai (2004) also found the entrepreneurial potential of Thai university students in that Attitude toward entrepreneurship, Social norms and Perceived entrepreneurial possibilities can jointly predict entrepreneurial intentions of university students in Thailand.

10. Research Suggestions

10.1 Research Limitations

The researchers acknowledged research limitation in sampling--only two private universities in Bangkok. Therefore, the course guidelines and the teaching and learning arrangements may be different from other government higher education institutions in terms of expenses, the odds in the labor market, faith in the institution, strength in the body of knowledge, academic and study intention, which will affect the intention to become entrepreneurs of business administration students. It should be noted that Thai private universities nowadays tend to focus more on the production of business students as entrepreneurs than academics in specialized fields.

10.2 Research Benefits

This research identified the characteristics of business administration students to become entrepreneurs. The findings on the identified characteristics as well as the causal factors for entrepreneurial intention could be used for curriculum development, courses and work-related internship pertinent to the needs of business administration students. The development of entrepreneurship helps integrate business education knowledge and applications regarding business opportunities for a person to start a business based on knowledge derived from disciplines in accounting, finance, marketing, management, and business environment.

10.3 Recommendations for Future Research

The researchers would like to see further studies related to the obtained findings in the present study: Entrepreneurial Attitude Factor (AT) as an important factor affecting other factors, namely, educational management to entrepreneurship (EE) and controllability factor, Behavior (PB), and entrepreneurial intentions (EI) among business-major students in higher education institutions nationwide. It was also expected that the inclusion of more higher education institutions with business and entrepreneurship programs can determine the consistency of the data and obtained findings to benefit in-service training programs of business organizations as well as higher education courses and programs in business administration and entrepreneurship development.

11. The Authors

The researcher Nalinratn Kettronge is a business graduate student at Southeast Asia University, Thailand. The second and third co-authors--Puttithorn Jirayus and Napaporn Khantanapha--are professors and thesis supervisors in the Master of Business Administration Program at the same university.

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ISSN 2821-9074 (Online)
ISSN 2730-2601 (Print)
RICE Journal of Creative Entrepreneurship and Management, Vol. 4, No.2, pp. 33-42,
May-August 2023

doi: 10.14456/rjcm.2023.9
Received 22.07.23/ Revised 7.08.23/ Accepted 22.08.23

Factors Affecting the Retention of Operational Employees in 5-star Hotels: A Case Study of Aetas Lumpini Hotel

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Abstract

This research identified factors affecting the retention of operational employees in 5-star hotels as a case study of Aetas Lumpini Hotel. The researchers examined the relationship of personal, internal and external factors with the employee retention at the operational level. Quantitative data were obtained from 60 voluntary hotel-staff respondents via a constructed questionnaire on three types of factors--personal, internal factors and external. The results revealed that the personal factor of *need for success* and the internal factor of *autonomy at work* were at the a very high level, while the external factor of geography was at a moderate level. It was expected that the hotel could use the obtained findings to adjust practices used by the human resource management department in retaining its quality personnel.

Keywords: *Retention, personal factors, internal factors, external factors, Aetas Lumpini Hotel*

1. Introduction

Kasikorn Research Center has reported new entrepreneurs investing in hotel construction since 2017 and the entry by new operators resulted in an increasing number of hotels in the market in Bangkok, Thailand. The competition in the hotel business market has become more intense in the hotel business market. As a result, hotel operators in the market have cautiously expanded their business. The issuance of construction permits for hotels across the country in the first three quarters of 2016 was 1,936 buildings, an increase of 68.51 percent from the first three quarters of 2015, reflecting the competition between hotel operators being intensified. It was found that the government agencies, private sector and international organizations tended to use the hotel business as a venue for various events as well--modifying the role of the hotel business from providing accommodation to hosting exhibits and conferences as well as organizing social events. With such new demands, it is necessary for hotel operators to have efficient human resources in support of different needs of service users. (Kasikorn Research Center, 2017).

Human resources are valuable capital and essential elements for the success of any business organization especially in the hotel industry, which is a large part in the global service industry. Most hotel employees provide services directly to the service users with customer satisfaction as their goal; success and differentiation in quality services depend on the skills, knowledge and competence of service providers. It requires service-minded operational staff and their willingness to provide quality services to impress guests and incoming visitors to different functions and events on hotel premises (Khansamrit, 2018; Prasitthikul, 2018).

The most valuable human resources in the hotel industry should be retained with the organization, consisting of lower level (entry level), a large number of semi-skilled and skilled staff as well as those at the management level (management). The human resource management in the hotel industry is an asset management in that all employees are to carry out their duties systematically while maintaining a continuous relationship with the organization to prevent a shortage of personnel in various types of work. Human resources are like the main raw materials for successful service and are an important part that makes customers satisfied. If each month, quite a number of employees resign, the overall picture throughout the year will end up with the loss of employees with different abilities, and inevitably result in more recruitment costs and time in training new employees to understand their responsibilities on various jobs. New employees need time to adapt themselves to the organization and they might decide to stay or leave if the operating system is not up to their expectation (Rommaneeyakul, 2018; Sarach, 2018; Sombatsri, 2018; Sudsuwanna, 2018). In this regard, the researchers would like to investigate the factors that affect employees' decision to stay or resign as a critical issue on the retention of employees in the hotel business. The investigation on the retention of employees in the hotel business in this study had its focus on a case study of a 5-star hotel in Bangkok—Aetas Lumpini Hotel that required research to support its human resource management department.

2. Objectives to Study

There were two research objectives:

1. To identify factors affecting the retention of operational employees in 5-star hotels as a case study of Aetas Lumpini Hotel.
2. To examine the relationship of the personal, internal and external factors with employees' retention at the operational level.

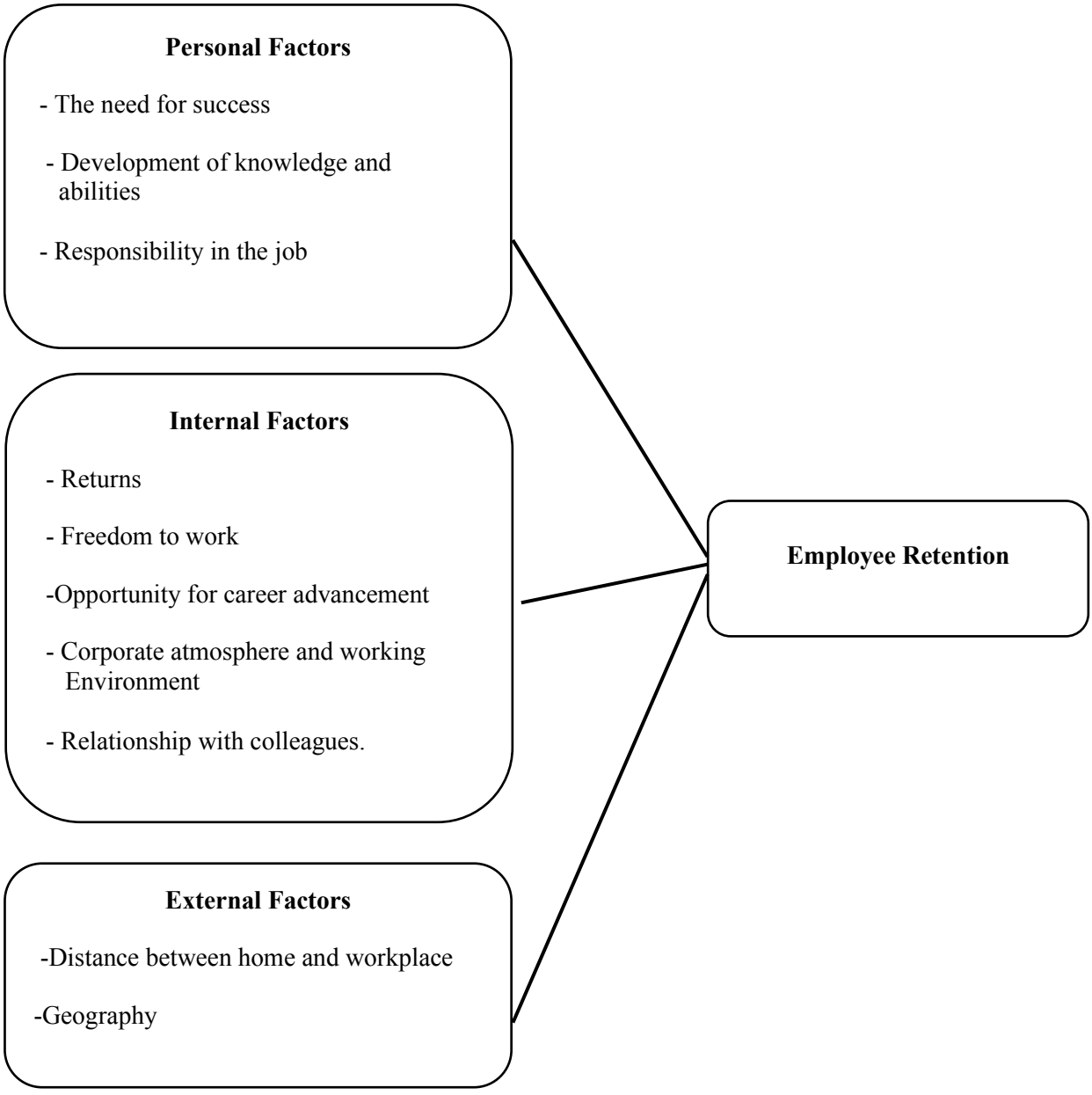
3. Scope of study

The scope of content covered three factors: (1) Personal factors dealing with need for success, knowledge development and job responsibilities; (2) Internal factors concerning freedom in work, opportunity for career advancement, corporate atmosphere, working environment and relationships with colleagues; and (3) External factors involving distance between home and workplace, and geography. The participants to respond to the constructed questionnaire were the personnel at the operational level of Aetas Lumpini Hotel in Bangkok.

4. The Conceptual Framework

The researchers developed a conceptual framework of three factors for the study as shown in Figure 1.

Figure 1: The Conceptual Framework



5. The Method of Study

The researchers constructed a questionnaire comprising the three factors—personal, internal and external, as affecting the retention of employees. The tool was validated by three experts in hospitality business also containing a part on demographic variables of the participating employees. The Item Objective Congruence (IOC) Index was pegged at 0.70 and Cronbach's Alpha reliability at 0.75. The questionnaire response data were collected in late 2022; the obtained data were analyzed for frequency, percentage, mean and standard deviation.

6. Results

The results of the study are reported in Tables 1-4.

Table 1 shows all 60 respondents' demographic variables:

Gender: Male = 20 (33.33%), 40 Female = 40 (66.67%)

Age: 21-25 years = 2 (3.33%), 26-30 years = 30 (50%), 31-35 years = 16 (26.67%), 36-45years = 8 (13.33%), 41 years or more = 4 (6.67%).

Marital Status: Single = 42 (70%), Married = 10 (16.67%), Divorced = 2 (3.33%), Separate = 6 (10%)

Level of Education: Secondary = 14 (23.33%), Vocational/Diploma =18 (30%), Bachelor's = 28 (46.67%)

Monthly Income: Less than 10,000 baht = 10 (16.66%), 10,000-20,000 baht = 20 (33.33%), 20,001-30,000 baht = 26 (43.33%), 30,001-40,000 = 2 (3.33%), 40,001-50,000 baht = 2 (3.33%)

Table 1: Demographic Variables of Respondents

Items	Frequency of Responses	Percentage
Gender.		
Male	20	33.33
Female	40	66.67
Total	60	100
Age		
21 – 25 years.	2	3.33
26 – 30 years.	30	50.00
31 – 35 years.	16	26.67
36 – 40 years.	8	13.33
41 years or older	4	6.67
Total	60	100
Marital Status		
Single.	42	70.00
Married.	10	16.67
Divorced.	2	3.33
Separated.	6	10.00
Other (please specify)……	0	0.00
Total	60	100
Education Level		
Secondary school	14	23.33
Diploma	18	30.00
Bachelor	28	46.67
Master	0	0
Dotorate	0	0
Total	60	100
Monthly income		
Less than10,000 baht	10	16.66
10,000-20,000 baht	20	33.33
20,001-30,000 baht	26	43.33
30,001-40,000 baht	2	3.33
40,001-50,000 baht	2	3.33
More than 50,000 baht	0	0.00

Items	Frequency of Responses	Percentage
Total	60	100

Table 2 reports the overall picture of the personal factors at a high level with an average of 4.01, which could be separated into individual items as follows: *the need for success* was at a high level with an average of 4.17, followed by *responsibility in the job* at a high level with an average of 4.10, and finally, *development of knowledge and abilities* was at a high level with an average of 3.76.

Table 2: Analysis of Personal Factors

Personal Factors	$\bar{X}$	S.D.	Interpreted Results
1. Need for success	4.17	.71	high level
2. Development of knowledge and abilities	3.76	.79	high level
3. Responsibility in the job	4.10	.69	high level
Total	**4.01**	**.73**	**high level**

Table 3 displays the overview of the internal factors at a high level with an average of 3.92, which could be separated into individual items as follows: *freedom to work* was at a high level with an average of 4.31, followed by *returns* at a high level with an average of 4.00, *opportunity for career advancement* at a high level with an average of 3.81. The factor on *corporate atmosphere and working environment* was at a high level with an average of 3.80 and finally, the factor on *relationship with colleagues* was at a high level with an average of 3.70.

Table 3: Analysis of Internal Factors

Internal Factors	$\bar{X}$	S.D.	Interpreted Results
1. Returns	4.00	.66	high level
2. Freedom to work	4.31	.59	high level
3. Opportunity for career advancement	3.81	.69	high level
4. Corporate atmosphere and working environment	3.80	.72	high level
5. Relationship with colleagues	3.70	.87	high level
Total	**3.92**	**.71**	**high level**

Table 4 reveals that the overall picture of external factors at a moderate level with an average of 3.57, which could be separated into individual items as follows: the distance between home and workplace was at a moderate level with an average of 3.52, and the factor on geography was at a moderate level with an average of 3.76.

Table 4: Analysis of External Factors

External Factors	$\bar{X}$	S.D.	Interpreted Results
1. Distance between home and workplace	3.52	.87	moderate
2. Geography	3.61	087	moderate
Total	**3.57**	**.87**	**moderate**

7. Discussion

The obtained findings on three interrelated factors--personal, internal and external--affecting the retention rate of the operational staff at Aetas Lumpini Hotel can be discussed as follows:

7.1 Personal Factors

The need for success was found at a high level; this point corresponded with the study by Dispao (2014) who identified factors affecting organizational commitment of employees at Mae Fah Luang Chiang Rai Airport that *the need for success* affected organizational engagement at a high level. The in-depth interview data in the present study pointed to most employees wanting to improve their work efficiency to be more competent at work.

As for the factor of *knowledge development*, it was found that the overall picture was at a high level. This point was different from the research finding reported earlier by Khantakam (2012) in that among the factors affecting organizational commitment and performance of private vocational college teachers in the central region, *knowledge development* did not affect their commitment to the organization. The in-depth interview data in the present study revealed that the organization should promote the development of knowledge and competency for employees, support the exchange of knowledge among colleagues particularly the work and methods the employees are responsible for, and provide training for a variety of skills to perform well on given tasks.

The factor of *job responsibility* was found in the overall picture at a high level. Dispao (2014) who studied factors affecting organizational commitment of employees at Mae Fah Luang Chiang Rai Airport also identified job responsibility as affecting organizational commitment at a high level. Similarly, Klongchoengsan (2013) studied job satisfaction in terms of motivation factors affecting employee dedication to the organization at SCG Building Materials Company, Limited, and found *job responsibility* as impacting employees' dedication to the organization. The questionnaire data in the present study pointed to the overall aspect of success in demand at a high level and the interview in-depth responses revealed that most employees had a clear scope of duties, opportunity to take on appropriate job responsibilities, and autonomy or abilities to plan and proceed at work without tight supervision

7.2 Internal Factors

The return/ reward factor was perceived at a high level by the employees under study; this point corresponded with the study by Aphibansri (2015) who examined the influence of human resource management on organizational commitment of the operational staff in the hotel business in three provinces—Mukdahan, Nakhon Phanom, and Nong Khai. The results of the study showed that *the returns* influenced the organization's commitment. Rakshue (2015) also found a similar result--studied the existence of craftsmen in small and medium enterprises and found *the rewards* affecting the retention of craftsmen in the MMC Industrial Estate. Ratnuam (2013) reported the relationship between organizational commitment and quality of working life of personnel of the Office of Promotion and Continuing Education, Prince of Songkla University at a high level. Khantakam (2012) also found a similar finding in that private vocational college teachers in the central region of Thailand perceived *the return* as affecting organization engagement and operational efficiency at a high level. Laohawiroj (2012) added that the staff of Kusumarn Subdistrict Municipality considered morale affecting their performance. The present study found *the return/ reward* had a moderate effect on the employees' work morale and the in-depth interviews found that salary/ welfare/ rewards/ bonuses must be appropriate to retain employees.

The researchers found the factor on *freedom of work* at a high level. Such a finding corresponded with the studies by Rakshue (2015) and Kongthon (2016) who asserted that *work autonomy* influenced organizational commitment at a high level. However, Janyasawatsri (2013) reported that work autonomy had a moderate influence on organizational commitment in the university context. The present study's interview data affirmed that the participating respondents valued independent work as well as shared roles when using new technologies at work.

As for *career advancement opportunities,* the participating respondents put them at a high level. Khantakam (2012) and Dispao (2014) earlier shared such a viewpoint in that private vocational college teachers in the central region of Thailand and university employees highly valued career opportunities offered by their organizations. In addition, Laohawiroj (2012) asserted that *career advancement opportunities* affected morale in the workplace. The present study's interview data signified opportunities for advancement, support from supervisors and colleagues, the positive work environment, and employees' involvement in various activities of the organization.

The factor on *organizational atmosphere and working environment* was perceived by the participating respondents at a high level in the present study. Khantakam (2012) and Janyasawatsri (2013) found similar results in that the studied employees in vocational college and universities perceived the *organizational atmosphere and work environment* as affecting organizational engagement as well as willingness to stay on the job. However, Laohawiroj (2012) emphasized the morale of the employees at Kusuman Subdistrict Municipality as affected by the working environment. To the interviewed participants in the present study, various environments within the organization, if appropriately equipped with modern and safe equipment should be able to satisfy workers to a great extent.

The factor on *relations with colleagues* was perceived at a high level by the participating respondents under study. This point was supported by three earlier studies--Khantakam (2012), Laohawiroj (2012) and Rakshue (2015)--in that the *relationships with colleagues* affected the retention of craftsmen, municipality employees, and vocational college/university teachers. Such positive relationships among employees accounted for work morale, organizational commitment, performance efficiency, and engagement with the organization. The obtained interview data in the present study pointed to the significance of the personal factors rendering good cooperation among colleagues in their operations, respect and willingness to listen and exchange information in work operations.

7.3 External Factors

The researchers found the factors of *distance between home and workplace* and *geography* perceived by the participating respondents at a moderate level. Such findings could be taken as the standpoint of employees that good jobs can attract them and they perhaps might be willing to relocate themselves for desired employment.

8. Recommendations and Suggestions

In this study, the researchers identified three factors—personal, internal, external—as affecting the retention of the operational staff in a five-star hotel under study. From the obtained results, seven individual items under the three factors accounted for what hotels should take into consideration: (i) the need for success, (ii) knowledge development, (iii) job responsibility, (iv) the return/ reward scheme, (v) career advancement opportunities, (vi) organizational atmosphere and working environment, and (vii) relations with colleagues. It is important for the human resource management department of a hotel to plan, set a relevant policy and implement the human resource development activities to retain quality employees to provide good services and in turn avoid unnecessarily high cost in recruiting and retraining new employees. Future research could focus on these individual factor items in support of efficiency in the hotel human resource management.

9. The Authors

Khewika Sukiam and the other five co-authors are lecturers in the BA Program in Tourism Innovation Program, Faculty of Liberal Arts and Sciences, Kasetsart University at Kamphaeng Saen Campus, Nakhon Pathom, Thailand. Currently, the authors have been working on the new department in service industry and language innovation. They share their research interest in the areas of community activities, human resource development, competencies in the hospitality industry, and language innovation.

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ISSN 2821-9074 (Online)
ISSN 2730-2601 (Print)
RICE Journal of Creative Entrepreneurship and Management, Vol. 4, No.2, pp. 43-61, May-August 2023

doi: 10.14456/rjcm.2023.10
Received 10.07.23/ Revised 28.07.23/ Accepted 20.08.23

Strategic Adaptive Leadership Development of Administrators of Eastern Vocational Education Institutions toward Excellence: A Focus on Thailand's Vocational Education Management 4.0 Policy

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Abstract

This research aimed to (1) identify the characteristics of strategic adaptive leadership development of administrators of eastern vocational education institutions toward excellence in accordance with Thailand's vocational education management 4.0 policy, (2) analyze the elements of strategic adaptive leadership of administrators of eastern vocational education institutions, and (3) propose a guideline for the development of strategic adaptive leadership of administrators of eastern vocational education institutions toward excellence in vocational education management. The researchers used (1) documentary analysis, (2) empirical data from 15 successful administrators' in-depth interviews, and (3) a questionnaire on three aspects of strategic adaptive leadership: (i) personal characteristics, (ii) work developed toward excellence, and (iii) personnel development and adaptation to the new normal. The data were collected from a sample of 622 persons--executives and personnel of vocational education institutions in Eastern Thailand. The obtained data were analyzed by exploratory factor analysis, tested by data triangulation methodology technique, and confirmation of a guideline drafted by the connoisseurship approach. The research results indicated that the strategic adaptive leadership of administrators of eastern vocational education institutions toward excellence contained nine elements: (1) charisma leadership and inspirational motivation, (2) individualized consideration and working as a team, (3) creating an innovative educational organization, (4) adaptive strategy and challenges, (5) building a positive corporate culture, (6) creating a creative corporate atmosphere and shared values,

(7) innovative leadership maturity, (8) mindset modification and intellectual stimulation, and (9) digital skills development toward excellence. The findings were expected to guide the adaptive leadership development of executive competencies in the nine dimensions to achieve excellence in vocational education management as stated in the 4.0 Policy of Thailand.

Keywords: *Strategic adaptive leadership, administrator, vocational education institution, vocational education, Thailand's 4.0 Policy*

1. Introduction

The mission of Thailand's vocational education institutes is to provide vocational training for students with the competencies needed in the 21 Century. It emphasizes technical and technological standards to meet the needs of the country's development following the 20-year national strategy plan. Administrators and teachers are key drivers of the desired reform. Academic development and quality behavior change offer opportunities for collaborative discussions with learners for time spent on extracurricular activities, knowledge for self-improvement, and teaching to its full potential. Building a learning society requires appropriate and effective learning materials created by vocational innovative institutions in accordance with Thailand's Vocational Education Management 4.0 Policy. Furthermore, the institute's performance report should be continuously monitored at all stages (Office of the Vocational Education Commission, 2019). Therefore, academic administration and vocational practice are at the heart of the strategically planned development. Vocational education institutions are decentralized in curriculum development, teaching and learning process, student development activities, measuring and evaluating, and creating media and learning resources. To ensure that learners' quality aligns with the standard qualification framework, administrators need a systematic and clear implementation plan. The Office of the Vocational Education Commission (2019) has established a focus on quality development as a guideline for driving the curriculum and learning management, including measuring and evaluating tools for learners. An efficient executive or leader must have good knowledge, abilities and attributes, be able to motivate, promote, support and lead teachers to achieve their goals. As known, educational institution administrators' leadership is related to learners' academic achievement, and modern leaders can realize the desired reform. Leaders who do not have a clear understanding of educational quality in concrete terms can take the organization into a wrong direction and subsequent failure (Phakamach et al., 2022).

Currently, the era of educational disruption caused by the COVID-19 pandemic has profound impacts on educational organizations' operations management in both the national and international competitions (Mukaram et al., 2021). The next normal requires a specific model or method of management to maintain the quality of education and minimize its impact on teaching and learning. However, in real-world situations, vocational school administrators will encounter many obstacles in achieving their goals on the performance of learners by the standards and skills of the 21st century. In this regard, leaders need to change the direction of thinking and management to keep pace with inevitable changes, especially in digital education, where a complete strategic plan covering the organization's operations is required for organizational restructuring and implementation (Saengkaew et al., 2021). Important issues include human resource management, educational innovation, online education management, and strategic control and evaluation--all integrated into a strategic management model for vocational institutions. Leaders need to handle the strategic management of vocational institutions in five stages: (1) strategic formulation, (2) strategic analysis, (3) strategic planning, (4) implementation of strategies, and (5) strategic control and evaluation (Phakamach et al., 2022).

When the socioeconomic environment changes, organizations must adapt to survive. Phakamach et al. (2021a) argued that modern education executives need to use leadership appropriately to build relationships with personnel to reach the common goals of the organization. They can influence individuals or groups of people by building trust in the first place. With confidence in work performance and supportive environment, leaders can prompt cooperation from their staff in assigned duties. In the case of the COVID-19 pandemic, leaders need to work like change agents in helping their followers to look for ways to do things differently. Such major changes in education, especially vocational education, require both instructors and learners to adapt to online learning and necessary digital practices (Yıldırım et al., 2021). This could also be an opportunity to reshape their strategic planning in educational management. Those required changes might need to review the concept and direction of educational development to suit their particular context. This will benefit their management operations as well as enhance the teaching-learning quality as a whole (Phakamach et al., 2022).

Strategic adaptive leadership of vocational education institutes is for executives to strive for excellence in accordance with Thailand’s Vocational Education Management 4.0 Policy. The research team of the present study would like to identify the characteristics and elements in order to be able to provide a guideline for strategic adaptive leadership development for the

administrators of vocational education institutions in the east toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy. The obtained findings can be used for training of desired competencies of adaptive leaders in the areas of planning, budget allocation, human resource development, new strategy development, and personnel collaboration. The Office of the Vocational Education Commission (2019) has always focused on developing executives' potential following Thailand's 4.0 Policy regarding technical and soft skills necessary for careers and surviving in a rapidly changing society. This is to enable vocational education executives and related parties in the digital age to ensure quality and efficiency in the framework of the Vocational Education Standards B.E. 2562/ 2019, Human Capital Development stated in the 20-year National Strategy 2018-2037 and the National Education Plan 2017-2036.

2. Research Objectives

The study had three research objectives:

1. To identify the characteristics of strategic adaptive leadership of administrators of eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy.

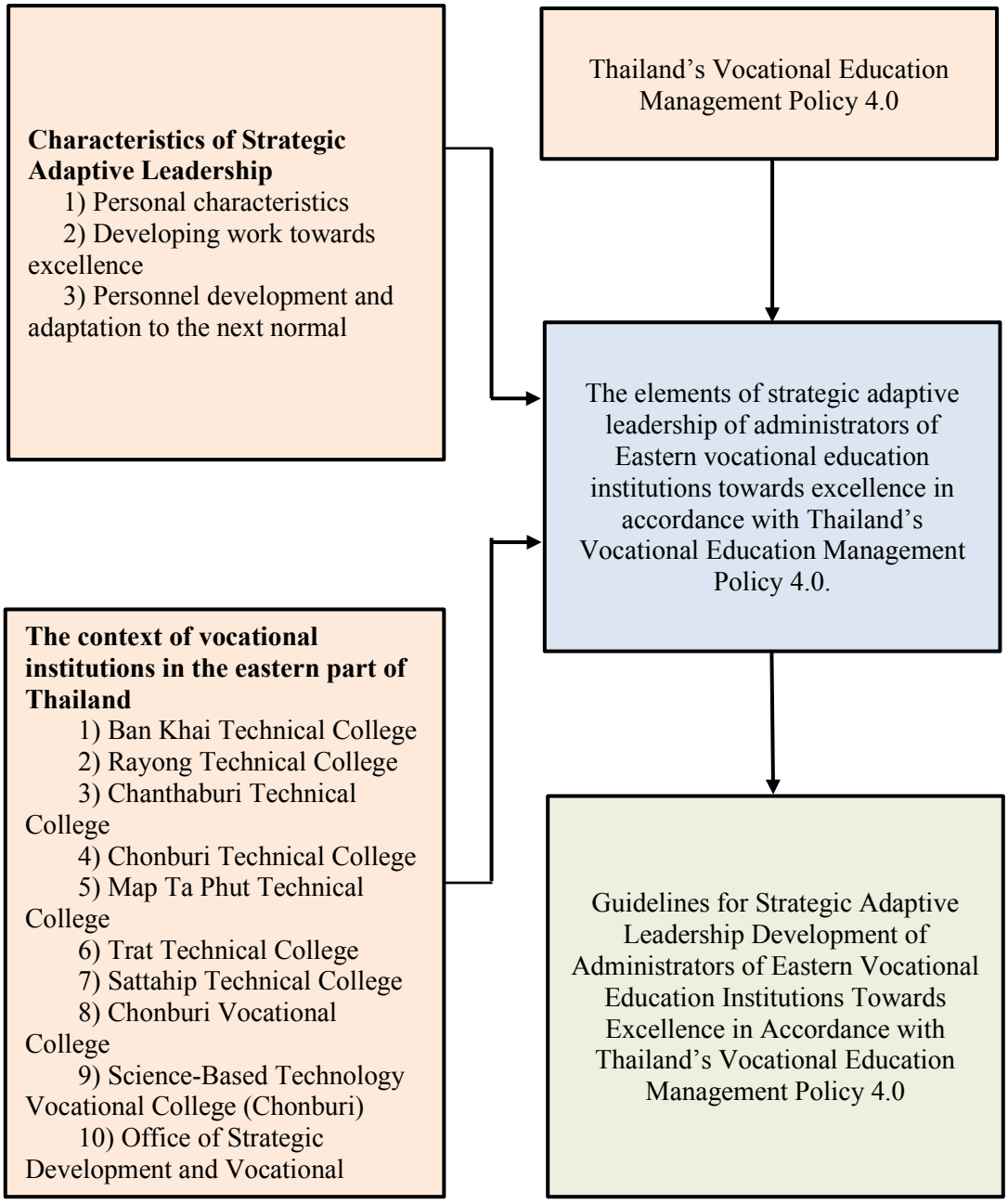
2. To analyze the elements of strategic adaptive leadership of administrators of eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy.

3. To propose a guideline for the development of strategic adaptive leadership of administrators of eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy.

3. Research Conceptual Framework

Based on literature review, documents, and related research, the research team developed a conceptual framework as shown in Figure 1.

Figure 1: Research Conceptual Framework



4. Research Methodology

This research used both quantitative and qualitative research with the details as follows:

4.1 Population and Samples

(1) The population included teachers and educational personnel of vocational education institutions in Thailand's eastern region. For the academic year 2022, 1,487 students from 9 institutions in 4 eastern provinces--Chonburi, Rayong, Chanthaburi and Trat.

(2) The sample included teachers and educational personnel in 9 vocational education institutions. The size was determined by Taro Yamane's formula for calculating the number of participants. The researchers also used the proportional method and the simple random sampling method to obtain a sample of 622 people. As for the interview data on executives of vocational education institutions in the eastern region, the size of the sample was determined by the snowball sampling selection method. The researchers approached 15 experts in vocational and technical education administration by convenience sampling, according to the specified qualifications: (i) current or former executives at the director level in public and private vocational institutions, (ii) with experience in managing public and private vocational institutions for at least 3 years, and (iii) success records in educational organizations development.

4.2 Research Instruments

The quantitative tool used in this research was a five-level rating scale questionnaire based on Likert's methodology in three parts: personal characteristics, work development toward excellence, and human resource development and adaptation. The criteria for scoring were:

Strongly agree: Score 5
Agree: Score 4
Neutral: Score 3
Disagree: Score 2
Strongly disagree: Score 1

The researchers used a semi-structure interview guide which was tested in structure and content by three experts. The guide carried a conformity index of .5 or higher, an IOC value of .902, and piloted with 30 non-sample vocational school executives. The final version had Cronbach's Alpha Coefficient at .927.

4.3 Data Collection

The researchers collected both quantitative and qualitative data between October and December 2022. The qualitative interview data were obtained from fifteen experts and the quantitative data were collected online at 622 copies or 100% returned.

4.4 Data Analysis and Synthesis

The obtained qualitative data were analyzed by content with classified specifications, while the quantitative responses to the questionnaire were analyzed by Social Science Statistical Programs for percentage, mean, and standard deviation. The tool was used to secure the elements of strategic adaptive leadership of administrators of Eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy. The 5-level estimation scale with numerical values used as criteria for consideration: Level 5 = Strongly Agree, Level 4 = Agree, Level 3 = Neutral, Level 2 = Disagree and Level 1 = Strongly Disagree.

An average score of 4.50 - 5.00: Practicality at the Strongly Agree level.

An average score of 3.50 - 4.49: Practicality at the Agree level.

An average score of 2.50 - 3.49: Practicality at the Neutral level.

An average score of 1.50 - 2.49: Practicality at the Disagree level.

An average score of 1.00 - 1.49: Practicality at the Strongly Disagree level.

The scores as such were for the interpretation of the obtained results for conclusion and discussion.

4.5 Research Procedure

The research procedure was in four stages as follows:

Step 1: Study of the characteristics of strategic adaptive leadership of administrators of Eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy, in the aspects of (i) theoretical concepts from relevant documents, textbooks, and research on leadership and strategic adaptive leadership of vocational education institute executives; and (ii) in-depth interviews of 15 vocational institute executives regarding their successful performance on managing vocational education institutions.

Step 2: Analysis of the elements of strategic adaptive leadership of administrators of eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy. The researchers used the results from step 1 to create a questionnaire with an estimated scale and submitted the participants' responses for Exploratory Factor Analysis (EFA).

Step 3: Data triangulation was performed on the obtained data in steps 1 and 2 to determine whether they were similar, different or consistent to conclude the characteristics and elements of strategic adaptive leadership used by the vocational education executives under study.

Step 4: Presentation of strategic adaptive leadership of administrators of eastern vocational education institutions via a seminar among fifteen experts in vocational and technical education management for their reaction to the data obtained in step 3 to determine the appropriate approach to the strategic adaptive leadership development of administrators of eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy.

5. Results

The researchers reported the obtained results by three research objectives on the identified characteristics and elements of strategic adaptive leadership development, followed by a proposed guideline to strategic adaptive leadership development for vocational education administrators for excellence as prescribed by Thailand's 4.0 Policy.

5.1 Characteristics of Strategic Adaptive Leadership

Based on the findings on research objective 1, there were characteristics of strategic adaptive leadership management as follows:

(1) *Personal characteristics* include proactive, high expectations for job achievement and commitment to completion, flexible adaptation to the situation with a broad vision, creativity, action with dignity, and a democratic viewpoint. It is important to make decisions based on cause-and-effect reasoning, have good human relations, fairness and morality and ethics, academic and research knowledge in coping with the world's changing situation. The teaching and learning arrangements include the appropriate use of educational materials, technologies and innovations, and willingness to invent and experiment with new teaching techniques.

(2) Strategic adaptive leadership development consists of goal setting of education management for excellence in accordance with Thailand's Vocational Education Management 4.0 Policy with an emphasis on the participation of all parties concerned—analysis of current conditions, opportunities, and obstacles that correspond with real-world situations. Vocational education adaptive leaders need to develop clear systems and structures, supervise operations accordingly, promote teamwork by involving stakeholders in thinking and doing, hold regularly meetings with the staff for creative academic work, conduct research, and create innovations in vocational education for excellence in vocational education development at the national level.

(3) Adaptive leaders aim at the new normal by preparing personnel with knowledge and ability to adjust teaching and learning through various methods, such as conferences, seminars, webinars, and training programs for the faculty's interests. Other adjustments include classroom research, innovations in new teaching methods, activities or exhibitions for the faculty to disseminate academic works in various ways to reach desired academic communities. Teachers should be encouraged and advised in academic and research work in support of their professional advancement.

5.2 Elements of Strategic Adaptive Leadership

The researchers found nine elements of the strategic adaptive leadership of administrators of eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy. The results of the analysis of the exploratory elements from empirical data revealed that the strategic adaptive leadership management of vocational education administrators carried nine elements with a total of 108 indicators. These elements accounted for 83.69%, as displayed in Table 1.

Table 1: Nine Elements of the Strategic Adaptive Leadership Management of Vocational Education Administrators in the East of Thailand

Elements	Element names	Number of items	Eigen Value	Percentage of variance
1.	Charisma Leadership and Inspirational Motivation	16	16.767	22.446
2.	Individualized Consideration and Working as a Team	15	15.532	17.009
3.	Adaptive Strategy and Challenges	14	13.245	11.212
4.	Creating an Innovative Educational Organization	13	11.198	9.004
5.	Building a Positive Corporate Culture	12	9.502	7.372
6.	Creating a Creative Corporate Atmosphere and Shared Values)	11	7.014	6.415
7.	Innovative Leadership Maturity	10	5.761	5.002
8.	Mindset Modification and Intellectual Stimulation	9	4.102	3.037
9.	Digital Skills Development toward Excellence	8	3.729	2.202
Total				**83.69**

(1) *Charisma Leadership and Inspirational Motivation* means that the leader behaves as an example to his/her followers and is willing to see the work's value and challenges in the organization's best interest. There are 16 components: (i) be stable and in self-control, (ii) be creative and listen to other people's opinions, (iii) be committed and dedicated to accomplishing tasks, (iv) adhere to creative ideas, (v) be a leader of change, (vi) be flexible by adapting to situations and solving problems promptly, (vii) be respectful and do not place themselves above others, (viii) behave like friends and be friendly to colleagues, (ix) be kind, helpful, and caring for the suffering of colleagues, (x) behave as a role model, (xi) be a knowledgeable and academic leader, (xii) have positive thinking and practice skills, (xiii) have good moral and ethical relations with the general public, (xiv) be fair and trustworthy, (xv) take into account academic and professional standards, and (xvi) create positive thinking and enthusiasm for colleagues.

(2) *Individualized Consideration and Working as a Team* refers to the leader's respect to individual differences and teamwork. There are 15 elements: (i) building good relationships, (ii) providing opportunities for people to learn new things, (iii) creating an atmosphere of support and promoting academic work, (iv) assigning tasks according to the potential of followers, (v) honoring others and acting with equality, (vi) empowering individuals to learn new things as needed, (vii) planning work with the interests of colleagues and organizations in mind, (viii) building commitments within the organization, (ix) promoting two-way communication, (x) mentoring constructively, (xi) creating values and challenges by encouraging teamwork, (xii) bringing followers to experience the beauty of the future, (xiii) creating and conveying what leaders aim, (xiv) expressing commitment to common goals and visions, and (xv) encouraging positive collaborators and positive imagination throughout the organization.

(3) *Adaptive Strategy and Challenges* means that leaders can combine their knowledge, skills, experience and creative ideas with their management strategies to create quality and competitive advantage. There are 14 components in this area: (i) having a strategic ability to solve problems and make decisions, (ii) using educational innovations to develop vocational education, (iii) acting as a good role model, (iv) having a progressive way of thinking both in-depth and broad, (v) having timely knowledge and solving specific problems, (vi) having the courage to innovate new and different ideas, (vii) having modern teaching and learning techniques, (viii) being open to experience in the preparation of future vocational courses, (ix) being well-tuned in strategic management, (x) understanding the principles of change

management and applying them for good, (xi) adjusting management styles according to changing contexts, (xii) being able to adapt oneself to changing educational situations, (xiii) implementing strategies that are appropriate to the situation, and (xiv) being able to adapt to society and the nation.

(4) *Creating an Innovative Educational Organization* refers to a model of innovation that allows an organization to exist under the conditions of change and development of innovations at the vocational level. There are 13 elements in this area: (i) understanding the patterns and practices that facilitate innovation, (ii) defining the appropriate innovation organizational structure, (iii) creating an organizational culture that supports innovation in all dimensions, (iv) defining the vision and strategy that will lead to an innovative organization, (v) defining the right hardware, software, and digital platform structure, (vi) creating a leadership team that strives to be a systematic innovation organization, (vii) developing a team with educational innovation habits, (viii) create an atmosphere and innovation ecosystem with a unique identity, (ix) creating effective knowledge management innovations, (x) supporting people to be creative and exchange learning freely, (xi) creating new options and career development in the digital age, (xii) aiming at an organization of excellence innovation, and (xiii) inspiring learning throughout the organization.

(5) *Building a Positive Corporate Culture* refers to the importance of the right-thinking process in the current management and readiness to support the organization's development into a competitive future. There are 12 elements in this area: (i) establishing good performance standards, (ii) establishing an organizational structure that is appropriate for the situation, (iii) establishing practical regulations, (iv) building collaborations in the team, (v) creating a teamwork system, (vi) supporting and motivating good intentions, (vii) creating positive awareness throughout the organization, (viii) creating a system of mutual acceptance, (ix) creating a system of commitment to the organization, (x) showing responsibility when things go wrong, (xi) creating sustainable value for the organization, and (xii) building loyalty to the organization.

(6) *Creating a Creative Corporate Atmosphere and Shared Values* means that leaders create a positive corporate atmosphere and look for opportunities to be ready to adapt and be sensitive to all kinds of changes and risks. There are 11 elements in this area: (i) creating unity in the organization, (ii) creating an atmosphere of exchange of learning, (iii) being an academic and professional role model, (iv) leading a learning organization, (v) having a constructive academic and research circle, (vi) encouraging and facilitating learning at all times, (vii) diligently attending academic seminars at both

national and international levels, (viiii) allowing colleagues to choose the right approach and take action with potential, (ix) creating an atmosphere of harmony, (x) cultivating creative shared values throughout the organization, and (xi) encouraging people to feel successful and achieving leadership at all levels to lead to a lifelong learning organization.

(7) *Innovative Leadership Maturity* means that leaders always have ideas and practices for innovation in education. There are 10 components in this area: (i) having an innovative leadership personality and skills, (ii) leading the development and dissemination of educational innovations, (iii) being a good role model for innovation, (iv) understanding the process of creating and developing educational innovations, (v) promoting the development of new educational technologies and innovations, (vi) creating an atmosphere of lifelong learning, (vii) creating an innovation ecosystem and aiming for an organization of educational innovation, (viii) setting the direction and enabling continuous and sustainable innovation, (ix) creating powerful leadership communication, and (x) developing the competencies of educational innovations to serve learners effectively.

(8) *Mindset Modification and Intellectual Stimulation* refers to a leader who makes followers alert to change by being aware of problems and how to solve them tactfully. There are 9 components: (i) having knowledge management process for the benefit of developing students' skills, (ii) being well-versed and aware of academic work, (iii) having the ability to mentor others, (iv) having the ability to use media, innovation, and modern technology, (v) being able to create systematic performance reports, (vi) having knowledge and understanding of techniques and methods of teaching both offline and online, (vii) understanding their potential by learning new teaching methods and experimenting in practice, (viii) being up-to-date and able to solve specific problems promptly, and (ix) promoting the development of new ideas to keep up with the world.

(9) *Digital Skills Development toward Excellence* refers to how leaders make followers aware of the development of digital skills, skills that must be learned and understood in the age of digital transformation in order to strive for excellence. There are 8 components in this area: (i) having applied thinking and adapting to all situations, (ii) being able to adapt to the new media phenomenon, (iii) learning and understanding a variety of sciences, (iv) having the ability to negotiate to deal with problems, (v) having knowledge and understanding of rational and emotional thinking, (vi) having knowledge and understanding of complex problem-solving skills, (vii) having the ability to innovate, always

developing digital skills, and (viii) striving for excellence throughout the organization.

5.3 Guideline to Strategic Adaptive Leadership

Based on the obtained results, the researchers proposed a guideline to strategic adaptive leadership development of administrators of eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy. The obtained results from the participants combined with the data from the experts in triangulation pointed to the following as a guideline:

(1) There are five ways to develop executive strategic adaptive leadership: self-development and exemplary practice development activities including the exchange of learning, model-based education, and experiential learning.

(2) The strategic adaptive leadership of administrators of eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy can utilize the PIER process consisting of (i) Planning (P), (ii) Implement (I), (iii) Evaluation (E), and (iv) Reflection (R). These are for improvement of thinking patterns and methods, and planning for the next phase of development

(3) Success factors in the strategic adaptive leadership of administrators of eastern vocational education institutions towards excellence in accordance with Thailand's Vocational Education Management 4.0 Policy include adaptive leadership development courses, support for adaptive leadership development resources, continuous and systematic monitoring and evaluation, followed by national and international leadership development networks.

6. Conclusion and Discussion of the Results

The findings were concluded and discussed in this section.

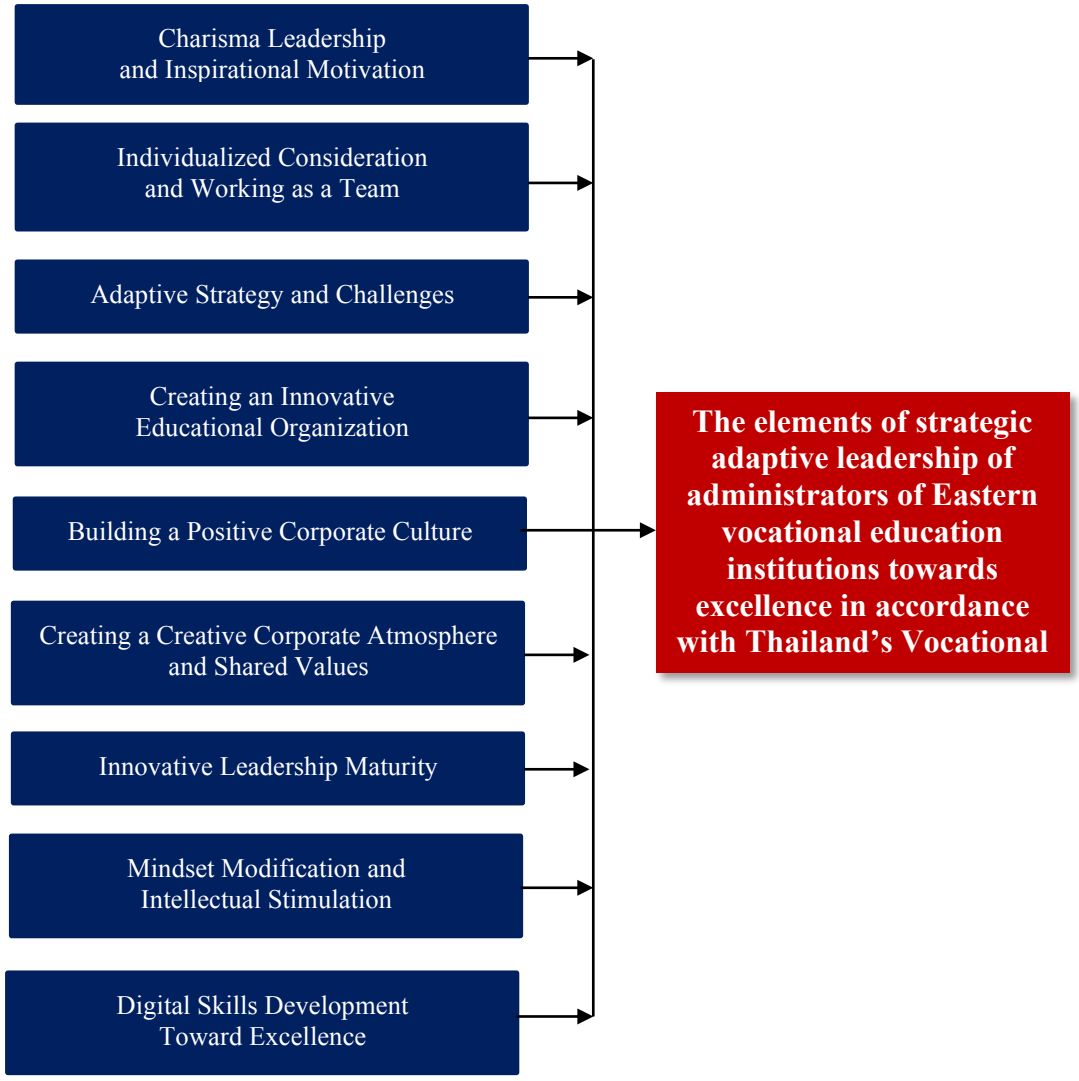
6.1 Conclusion

(1) The strategic adaptive leadership of administrators of eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy should have three characteristics: (i) personal characteristics, (ii) developing work toward excellence, and (iii) personnel development and adaptation to the next normal.

(2) The strategic adaptive leadership management of the administrators of Eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy comprised

9 elements and 108 indicators. The nine elements are graphically displayed in Figure 2.

Figure 2: Nine Elements of Strategic Adaptive Leadership of Administrators of Eastern Vocational Education Institutions toward Excellence in Accordance with Thailand's Vocational Education Management 4.0 Policy



(3) The researchers proposed a guideline for strategic adaptive leadership development of the administrators of eastern vocational education institutions toward excellence in accordance with Thailand's Vocational Education Management 4.0 Policy. The proposed guideline contained five aspects to develop strategic adaptive leadership of executives: (i) exemplary practice by case studies, (ii) teaching and training, (iii) meditation, (iv) learning

exchange via the use of media, technology and innovation in modern education, and (v) model education and experiential learning. The PIER process was suggested by the researchers: (i) Planning (P), (ii) Implement (I), (iii) Evaluation (E) and (iv) Reflection (R) for vocational institutions to develop these competencies in vocational education administrators.

It is important to develop leaders at all levels who can adapt to changing situations with the proposed characteristics and elements as identified in this present study. The adaptive leadership development program should yield positive outcomes for key personnel professional development.

6.2 Discussion

Based on the obtained results, there were nine points the researcher would like to bring to discussion:

(1) The first element of charisma, leadership and inspirational motivation appeared to serve well for adaptive leadership development that would affect followers to a great extent, as pointed out by Phakamach et al. (2022) and Fernandez & Shaw (2020) in that the behavior of leaders influences their achievement as well as relationship with instructors and staff for a friendly atmosphere, cooperation, inspiration and willingness to join efforts in achieving their common goals.

(2) The second element of individualized consideration and working as a team emphasizes the treatment of individuals with empathy and assistance to those inexperienced at work, as reported earlier by Phakamach et al. (2021a) in that educational institution executives have decision-making power in planning, budget allocation, personnel development and collaboration, and management strategies to align institutional management with the realities of society.

(3) The third element of adaptive strategy and challenges combines leaders' knowledge, skills, and creative ideas with strategic management abilities to improve the quality and efficiency of work processes within the organization. This point was in line with the study by Striteska & Prokop (2020) and Hawley (2021) in that people who live a quality and happy life must adapt to new ways of living. A good strategic management model for vocational education can help guide such adaptation in: (i) strategic planning, (ii) strategy evaluation, (iii) direction, (iv) strategy formulation, (v) strategy implementation, and (vi) strategy implementation.

(4) The fourth element of creating an innovative educational organization helps the organization to exist under the conditions of change. This point was in line with earlier research by Karia & Asaari (2019) and Phakamach et al.

(2022) that signified collaboration with stakeholders. Adaptive leaders need to encourage talented personnel to develop innovations and creating a positive atmosphere for an innovative organization.

(5) The fifth element of building a positive corporate culture is to create a corporate culture to lead the organization toward its goals. Rehman & Iqbal (2020) also found a need for new education in a time of transformative educational change, and leaders must be able to work under pressure with others. The process of developing people to embrace a strong corporate culture, keep up with the changes, and value a transparent and fair assessment system is for the personnel to achieve the common goals.

(6) The sixth element of creating a creative corporate atmosphere and shared values has its focus on a positive atmosphere, shared values, and setting a good example for the personnel. Phakamach et al. (2022) and Fernandez & Shaw (2020) put forward the practice of mobilizing organizational talent to use new technologies personnel in support of the proper use of technology in time.

(7) The seventh element of innovative leadership maturity deals with leaders' behavior with a vision and commitment to change for the organization's benefit. Phakamach et al. (2022) and Karia & Asaari (2019) also highlighted such an element by finding ways to combine skills, knowledge and ideas across different parts of the organization to create innovations, unique advantages, continuous improvement and development for sustainability in the future. These involve strategies related to ICT systems and educational innovations.

(8) The eighth element of mindset modification and intellectual stimulation encourages followers to think about solving problems or issues with new strategies and approaches. This element was reported earlier by Miller's (2019) in that intellectual stimulation is for followers to think rationally in real-world situations, and encourage followers to be creative and able to achieve their goals through mutual efforts.

(9) The ninth element of digital skills development toward excellence, was also highlighted by Bartsch et al. (2021) and Phakamach et al. (2021b). It is vitally important for adaptive leaders to offer their knowledge and skills to collaborate with followers in all situations, enable organizations to exist and grow sustainably amidst digital transformation.

It can be concluded that the nine elements and the proposed guideline for the strategic adaptive leadership development of eastern vocational education institute executives according to Thailand's 4.0 policy could benefit vocational education agencies in developing the needed competencies of adaptive leaders.

7. Suggestions

The researchers would like to make two suggestions in the direction of applying the obtained findings to the relevant context and supporting further research.

Considering each component of the attributes or behaviors for strategic adaptive leadership development in two categories--academic and research-oriented behaviors, and functional competencies, vocational education institution decision-makers need to value their faculty and staff talent groups and set a clear career path for their competencies development in keeping pace with the rapid transformation of education.

As for further research, those interested in the current issues of educational management and adaptive leadership may want to explore: (i) participatory action research on adaptive leadership, (ii) educational innovations expected of executives to have knowledge and skills of adaptive leaders, and (iii) in-depth research in curriculum design and adjustment to catch up with the disruptive effects of the digital technology on teaching for sustainable development of the present time and beyond.

8. Acknowledgements

The authors of this paper would like to acknowledge the academic support from Rattanakosin International College of Creative Entrepreneurship (RICE), Rajamangala University of Technology Rattanakosin (RMUTR), and the Educational Administration Program, Rajapruk University, Thailand.

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ISSN 2821-9074 (Online)
ISSN 2730-2601 (Print)
RICE Journal of Creative Entrepreneurship and Management, Vol. 4, No.2, pp. 62-77,
May-August 2023

doi: 10.14456/rjcm.2023.11
Received 7.05.23/ Revised 5.08.23/ Accepted 21.08.23

Practical Learning Management System Combined with Case-Based Learning on Educational Resource Administration in the Digital Era

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Abstract

The objectives of this research were to (1) design and create, test, use and evaluate a prototype of a practical learning management system combined with case-based learning on educational resource administration in the digital era; and (2) recommend the evaluated practical learning management system combined with case-based learning on educational resource administration in the digital era. The sample group consisted of 92 graduate students in the Master of Education Program at Rajamangala University of Technology Rattanakosin in Academic Year 2022. Ten experts in ICT systems and educational innovations helped evaluate the constructed learning management system. The research was in four steps: (1) study and analysis of user requirements, (2) system design and development, (3) system function testing and evaluation, and (4) system performance improvement. Quantitative data analysis was by using statistical packages for mean and standard deviation. The qualitative data analysis was by content analysis. The obtained results indicated: (1) the prototype of a practical learning management system combined with case-based learning on educational resource administration in the digital era uses a DBLC (Database Life Cycle) development process. The experiment with the operational system for graduate learning involves learning via educational technology with a simple implementation. The participating students have a high level of satisfaction with the system prototype; and (2) The system has a structure consisting of a website, teacher and student database, knowledge record, knowledge assessment, discussion board, knowledge base, download documents, related case studies, and pictures of various activities. The research findings pointed to the benefits of the prototype system in providing students with practical ICT and learning skills for educational resources management in the digital era.

Keywords: *Learning management system, practical learning, case-based learning, educational resource administration, digital era*

1. Introduction

Information and Communication Technology (ICT) is a valuable tool for progress in national development. It is relevant to people's way of life in modern society. All societies have changed and adapted as members of the e-Society. Organizations developing and implementing appropriate ICT systems help executives and operators receive accurate and timely information. As a result, their decision-making in planning the organization's operations can be efficient in solving problems on time. They are able to compete for advantage in providing services to customers (Laudon & Laudon, 2018). Therefore, studying how to apply the appropriate ICT system for the organization is essential. The practical application of ICT to make timely decisions requires concrete management planning and includes various strategies in systematic management so that the organization achieves its objectives and has continuous development and sustainable growth (Phakamach, 2010; Sinlarat, 2020). The role of universities is to understand the changes and learn new ways to keep up with modern Thai and international technology in education management (Demir et al., 2021) with the introduction of modern management and management techniques. They are applied to educational administration in institutions for maximum academic efficiency and effectiveness (Phangphol & Phakamach, 2021).

The Ministry of Higher Education, Science, Research and Innovation Thailand has encouraged the use of ICT to enable learners to learn and develop themselves to a higher level of knowledge. This is in line with the government's policy according to the 20-year national strategy 2017-2036, and under the ICT Master Plan 3 (ICT Master Plan 3) in Higher Education Act B.E. 2562 in that more educational platforms are to support the global connection of information and create a new avenue for education. People use this main road as a path to intellectual treasures and to develop new learning styles (Lyapina et al., 2019). Therefore, the Ministry has established policies and standards to encourage educational institutions and agencies to implement the policy to promote the development of ICT for education. Teachers, educational personnel and learners can use educational platforms to benefit teaching and learning. In this regard, educational institutions at all levels require an effective ICT management system with educational innovations as benchmarks for improving the quality of education at all levels (Panjarattanakorn & Phakamach, 2020).

Teaching in the era of transformational change from education disruption has a variety of teaching and learning management models to promote and solve educational management problems in various fields, especially in time of the post-pandemic (Ismaili, 2021). Teaching and learning management must align with the new learning paradigm to enable learners to seek knowledge on their own. The principles under the Higher Education Act B.E. 2562 show that thinking process skills are still essential as an intrinsic factor influencing a person's actions and expressions. People with high thinking abilities will be able to solve problems at ease. Therefore, the development of thinking ability is an integral part of the development of learners to live happily in a changing society.

Case-Based Learning (CBL) is a teaching method in which learners can apply their knowledge in real situations to develop higher-order thinking. Most group learning has the critical goal on preparing learners for real-life practice. It is teaching that connects theory

with practice in which students can learn and deal with real situations (Raza et al., 2020). In the 21st century, the learning process puts teachers in a transition from educator to facilitator and requires tools for accessing knowledge through various methods. Technology or Learning Management Systems: LMSs, enable quick and efficient access to knowledge to be shared with classmates (Wachirawongpaisarn et al., 2020). This learning process is called "Active Learning," which takes students in focus or student-centered. The teaching method with the 21st century skills, utilizes modern teaching and learning technology, and allows students to learn through various activities (Maslov et al., 2021). If a learning management system is applied to teaching and learning with case studies and practical courses, it will make learning management more efficient and effective (Lyons & Bandura, 2020).

"Educational resource administration in the digital era" was designed as a core course in the master of education program at Rattanakosin International College of Creative Entrepreneurship (RICE), the Rajamangala University of Technology Rattanakosin (RMUTR) Thailand. This course focuses on the design and development of ICT systems, processes, and innovations for managing educational resources in the digital age. It includes the management of educational innovations for high quality in the teaching and learning processes (Phakamach et al., 2021). Most of the learning takes place in a regular classroom, combined with learning material provision on web applications and learning process management system that connects learners with teachers and learners with learners. Providing additional teaching aids or e-course wares supports self-directed learning via knowledge management to help solve problems and obstacles in students' learning (Yadav et al., 2017).

In this study, the researchers were interested in developing a practical learning management system combined with case-based learning on educational resource administration in the digital era. This learning system can support teaching and learning activities. The researchers designed and developed educational innovations with five dimensions: (1) electronic learning media, (2) a knowledge management support system knowledge repository, knowledge record, and a knowledge assessment form, (3) a database of teachers and students as well as academic services, (4) online electronic bulletin boards to exchange learning, and (5) linkage with universities (e-MIS). The prototype was meant as a model of a learning management system using software and services. The researchers assessed learning efficiency by satisfaction of the participating students under study. It was expected that performance improvements based on expert feedback would support the prototype which in turn should contribute to effective learning management on educational resources in the digital era.

2. Research Objectives

There were two objectives in this study:

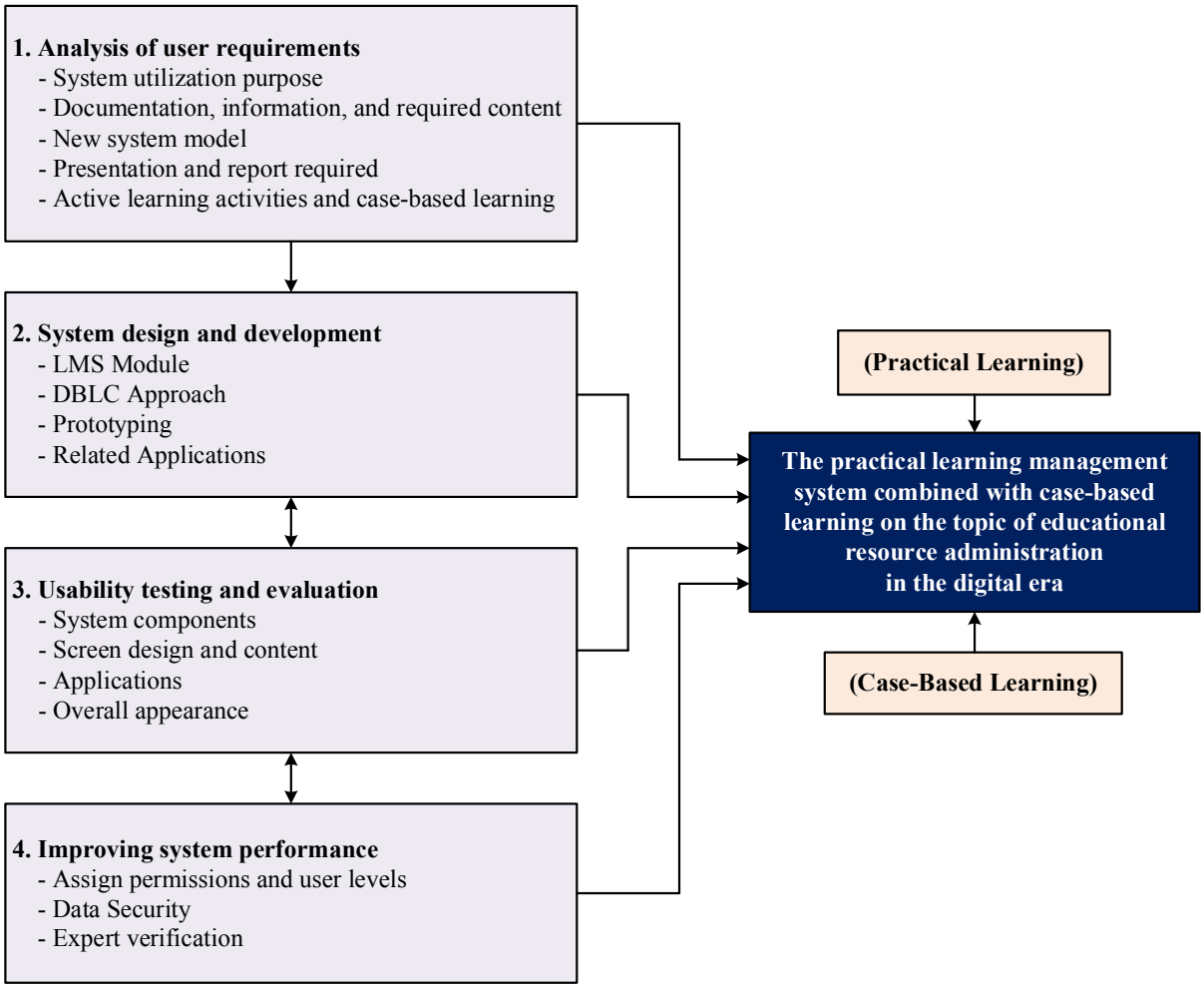
(1) design and create, test, use and evaluate a prototype of a practical learning management system combined with case-based learning on educational resource administration in the digital era, and

(2) recommend the evaluated practical learning management system combined with case-based learning on educational resource administration in the digital era.

3. Research Conceptual Framework

The researchers formulated the conceptual framework from the literature review and related research design process to create a practical learning management system combined with case-based learning on educational resource administration in the digital era. The research conceptual framework is shown in Figure 1.

Figure 1: Research Conceptual Framework



4. Research Methodology

This research aimed at developing a learning model for practical use at the graduate level with details as follows:

4.1 Population and Samples

The population selected for this research were students enrolled in the course RED 7306 on educational resources management in the digital era in a master's degree program in educational management and strategies at Rattanakosin International College of Creative Entrepreneurship (RICE), Rajamangala University of Technology Rattanakosin (RMUTR) in the first semester of Academic Year 2022. The sample group was 92 students from 116 students using the Krejcie and Morgan tables to determine the sample size. The researchers

set a target group of ten experts in ICT systems and educational innovation to provide validated data as needed.

4.2 Research Instruments

The research tools consisted of (1) a practical learning management system combined with Case-Based Learning on "Educational Resource Administration in the Digital Era" and (2) the tools for data collection as follows:

(1) Quality assessment form for ten experts in ICT systems and educational innovations using a 5-level estimation.

(2) Student satisfaction assessment form using a 5-level estimation to assess the suitability of the system in terms of components, design and content, and usability.

(3) Structured interview form to obtain interview data from the participating students on the system use issues: (1) knowledge and implementation, (2) behavior and response, (3) participation, (4) results of use, and (5) problems and suggestions.

4.3 Procedures in Conducting Research

This research is research and development (R&D) in nature--containing four steps:

(1) *Analysis of user requirements*, which is the study and analysis of user needs for both the faculty staff and students, in order to know the necessary requirements for constructing a learning management system.

(2) *System design and development* by using a learning management system and programs related to the development of online teaching materials, designing case studies related to the course, and including a preliminary test.

(3) *Functional testing and evaluation* in a 3-month trial phase, and satisfaction is assessed by students enrolled in the course RED 7306.

(4) *System performance improvement* by taking the test and evaluation results obtained from step 3 for confirmation and performance improvement of the constructed practical learning management system combined with case-based learning on "Educational Resource Administration in the Digital Era."

4.4 Experiment and Data Collection

The experimental model and the data collection procedure were set as follows.

The preparation of the experiment includes:

(1) Ask for permission to collect data and test the system in the first semester of Academic Year 2022.

(2) Develop a learning system prototype on the Learning Center, send the data to the server, and test the use of the learning prototype.

(3) Assign the place and computer facilities and schedule the experiment by testing the operating system in the designated content on "Educational Resource Administration in the Digital Era."

Experiment:

The system prototype was evaluated by ten experts and tested for performance evaluation according to the following format:

One-to-One Testing: An experiment with three students in the course--with their average grades at high, medium and low in the past semester. They were selected by simple random sampling to test the system for defects to be used for improvement at the value E_1/E_2 = 61.08/62.22.

Small Group: Nine students tested the experiment; they had averaged scores at high, medium and low in the past semester. They were selected by simple random sampling to test the system for defects to be used for improvement at the value E_1/E_2 = 71.18/72.03.

Field Testing:

(1) Ninety-two students used the system in a one-month workshop experiment in the following procedure: (i) Pretesting by an achievement test of 40 items, (ii) Learners studying the practical learning management system combined with case-based learning on educational resource administration in the digital era, (iii) Learners doing exercises from the system--ten items per learning unit, and (iv) Learners post-testing by the achievement test of 40 items for the overall efficiency of E_1/E_2 at 81.58/ 83.42.

(2) The researchers interviewed a sample group of students who used the system regularly.

(3) The researchers analyzed the results of the interview by content analysis and used the results to revise the system accordingly.

4.5 Data Analysis

The researchers analyzed the obtained data in the following sequence:

(1) *Analysis of user requirements* to illustrate the details that consist of (i) the purpose of the system, (ii) the required documents, information and content, (iii) the format of the new system, (iv) presentation and required report, (v) the activities of Practical Learning and Case-Based Learning, and (vi) practical activities.

(2) *Assessment of design and development* by ten experts in ICT systems and innovations for education administration to illustrate the details, which consist of (i) LMS Module, (ii) DBLC Approach, (iii) Prototyping, and (iv) related applications.

(3) *Functional testing and evaluation:* Assessment of the efficiency of the prototype system by experts and satisfaction by 92 students using a 5-level rating scale.

The research at this stage applied the process in steps 1 and 2 by assessing the effectiveness and satisfaction of use. The information adjusted the process as appropriate. The practical test was to obtain a system suitable for practical learning combined with case-based learning on educational resource administration in the digital era.

The participants were divided into two groups:

Group 1: 10 ICT experts in educational innovations.

Group 2: 92 students in educational resources management in the digital era (in a graduate course RED 7306).

The tool to collect data was an unstructured interview to check the learning system's effectiveness via identified problems and obstacles for corrective guidelines.

Data collection was divided by group:

Group 1: Workshops and interviews.

Group 2: Workshop facilitation and participant observation.

The questionnaire consisted of checklist questions on a 5-level estimation scale in three parts:

Part 1: Information about the respondents.

Part 2: Opinions on the use of the practical learning management system combined with case-based learning on educational resource administration in the digital era.

The score interpretation:

Strongly Agree; the weight was scored as 5.

Agree; the weight was scored as 4.

Neutral; the weight was scored as 3.

Disagree; the weight was scored as 2.

Strongly Disagree; the weight was scored as 1.

Part 3: Suggestions and guidelines for developing a practical learning management system combined with case-based learning on educational resource administration in the digital era.

Creation and verification of the questionnaire draft were submitted to experts for content validity and appropriateness of language use. The reliability by Cronbach's Alpha Coefficient was .958.

The data were then analyzed by statistical computer program:

Data analysis of group 1 was to find ways to improve and develop the system and recommend the effective use of the prescribed format.

Data analysis of group 2:

Part 1: Information on the status of the respondents by frequency and percentage.

Part 2: Information on opinions on the use of the practical learning management system combined with case-based learning on educational resource administration in the digital era. The scaled data were analyzed by mean and standard deviation.

Part 3: Information on recommendations and guidelines for developing a practical learning management system combined with case-based learning on educational resource administration in the digital era. The data were derived from content analysis to obtain recommendations and development guidelines.

The mean was obtained from the estimation scale questionnaire data with interpretation:

4.21 – 5.00: Highest efficiency and satisfaction

3.41 – 4.20: High efficiency and satisfaction

2.61 – 3.40: Moderate efficiency and satisfaction

1.81 – 2.60: Low efficiency and satisfaction

1.00 – 1.80: Lowest efficiency and satisfaction

where the spectral range determined by the formula = (5-1)/5 = 0.8

(4) Improvement of system performance

The researchers conducted interviews with ten experts in ICT systems and educational innovations using a non-structured interview, and applied the results to improve the system's performance. The prototype system is shown in Figures 2-6, respectively.

Figure 2: Login Window (Panjarattanakorn et al., 2022)

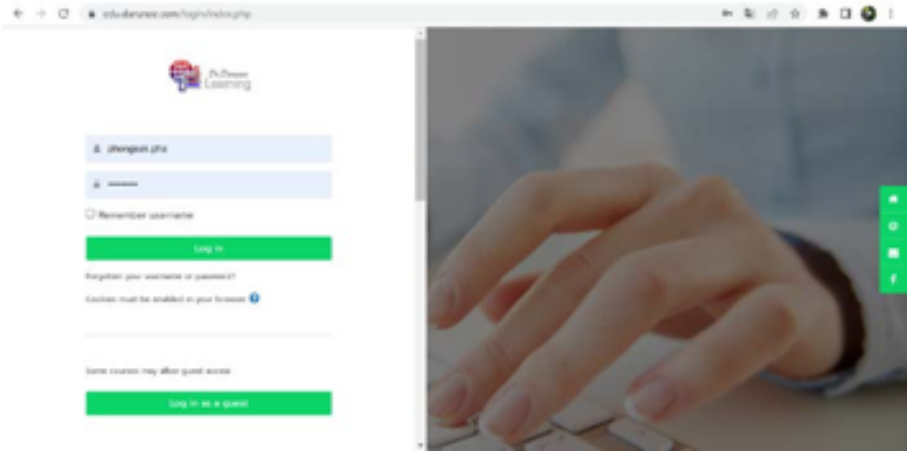


Figure 3: Practical Learning Systems of RED 7306 Course (Panjarattanakorn et al., 2022)

Figure 4: Example Course Content (Panjarattanakorn et al., 2022)

Figure 5: Example of an Instructional Video with a Case Study (Panjarattanakorn et al., 2022)

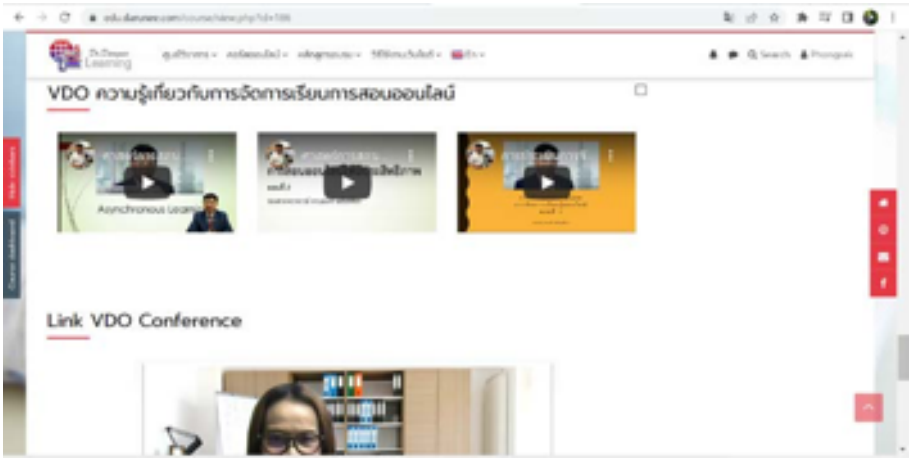
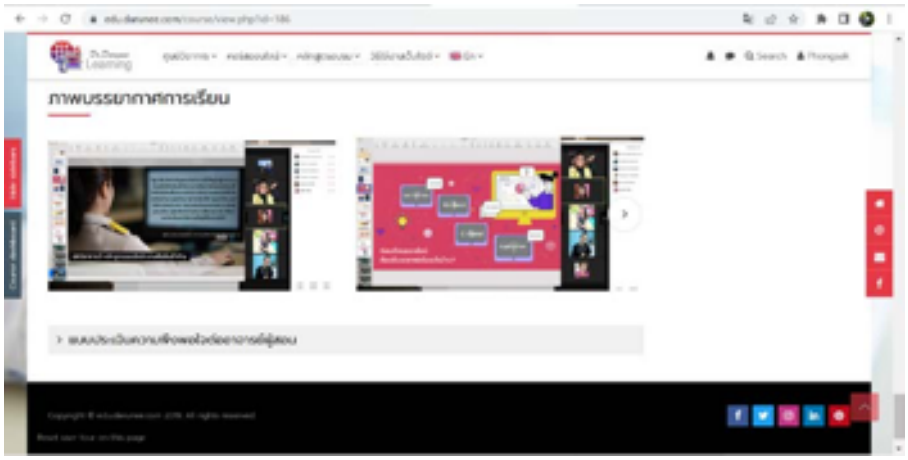


Figure 6: Picture of the Workshop in the Course (Panjarattanakorn et al., 2022)



5. Results

The researchers developed a practical learning management system combined with case-based learning on educational resource administration in the digital era, and obtained the findings as follows:

5.1 Research Results on Objective 1

The researchers designed, created, tested the use and evaluated a constructed prototype of a practical learning management system combined with case-based learning on educational resource administration in the digital era. The major findings were:

5.1.1 User requirements Analysis

(1) The user requirements analysis revealed users' needs in critical areas: (i) It must be a system to support teaching and learning in a given course; (ii) The system must support the process of teaching and learning with complete support functions; (iii) the system should provide operating parts consistent with the course content; (iv) the system should have relevant practical learning and case studies to enhance knowledge and understanding of the target topic; and (v) the system designed and built must operate by the designated class schedule.

(2) Guidelines and recommendations were secured for developing a practical learning management system combined with case-based learning on educational resource administration in the digital era. The system development method should be chosen according to the standard model like DBLC to achieve an operational learning system combined with case study learning.

5.1.2 System Design and Development

System design and development with the DBLC standard method carried six key steps: (i) System Analysis, (ii) System Design, (iii) System Implementation, (iv) System Installation, (v) System Operation and Evaluation, and (vi) System Maintenance and Evolution.

5.1.3 Functional Testing and Evaluation

The test and trial of a practical learning management system combined with case-based learning on educational resource administration in the digital era were by 92 students enrolled in RED 7306 course in the first semester of Academic Year 2022. The quality assessment was by experts and the satisfaction assessment by the participating students, as shown in Tables 1-2.

5.1.4 The effectiveness of the constructed practical learning management system combined with case-based learning on educational resource administration in the digital era, was obtained from 10 experts, as reported in Table 1.

Table 1: Results of Efficacy Assessment by Experts

Topics and Assessment Items		$\bar{x}$	**S.D.**
System components	1. Website	4.24	0.55
	2. Record knowledge	4.18	0.65
	3. Measuring and evaluating knowledge	3.88	0.55
	4. Discussion board	4.22	0.50
	5. Knowledge repository	4.06	0.55
	6. Learning activities	4.20	0.55
	7. Pictures of various activities	3.98	0.65
Screen design and content	8. Content and Consistency	4.42	0.45
	9. Format and font size	4.10	0.65
	10. Font color and background	4.06	0.55
	11. Visual and sound effects	4.16	0.65
	12. Multimedia system	3.62	0.50
	13. Instructions and Manuals	3.71	0.55
	14. Overall screen	4.39	0.50
	15. Design process	4.33	0.55
Usability	16. Membership system	4.32	0.45
	17. Back-end system	4.17	0.65
	18. Link section	4.22	0.45
	19. Interaction section	4.38	0.65
	20. Search system	3.98	0.55
	21. How to use it for the purpose	4.45	0.45
	22. Practice in the course	4.17	0.55
Total		**4.14**	**0.55**

Table 1 shows the system's overall quality at a high level in all aspects ($\bar{x}$=4.14, S.D.=0.55). As for each aspect, all 7 items were at a high level ($\bar{x}$=4.10), in the order of the

highest to the lowest: (i) website, (ii) discussion board, and (iii) learning activities. In terms of screen and content design, 8 items were overall at a high ($\bar{x}$=4.09), in the order of the highest to the lowest: (i) content and consistency, (ii) overall screen, and (iii) design process. As for the usage aspect in 7 items, the overall picture was high ($\bar{x}$=4.24) from the highest to the lowest: (i) how to use it for the purpose, (ii) the membership system, and (iii) the interaction section.

5.1.5 The results on the satisfaction assessment by 92 participating students regarding the use of the constructed practical learning management system combined with case-based learning are shown in Table 2.

Table 2: Results of the Satisfaction Assessment by Students

Topics and Assessment Items		$\bar{x}$	**S.D.**
System components	1. Website	4.39	0.45
	2. Record knowledge	4.21	0.67
	3. Measuring and evaluating knowledge	4.17	0.58
	4. Discussion board	4.23	0.74
	5. Knowledge repository	3.78	0.49
	6. Learning activities	4.33	0.67
	7. Pictures of various activities	4.27	0.62
Screen design and content	8. Content and Consistency	4.38	0.58
	9. Format and font size	4.25	0.57
	10. Font color and background	4.18	0.71
	11. Visual and sound effects	3.58	0.58
	12. Multimedia system	4.16	0.67
	13. Instructions and Manuals	3.77	0.62
	14. Overall screen	4.35	0.68
	15. Design process	4.30	0.50
Usability	16. Membership system	3.98	0.77
	17. Back-end system	3.76	0.68
	18. Link section	4.24	0.59
	19. Interaction section	3.97	0.65
	20. Search system	4.37	0.73
	21. How to use it for the purpose	4.41	0.65
	22. Practice in the course	4.28	0.68
Total		**4.15**	**0.64**

Table 2 shows students' overall system satisfaction at a high level in all aspects ($\bar{x}$=4.15, S.D.=0.64). As for three aspects, 7 items of the system were at a high level ($\bar{x}$=4.19) in a sequence: (i) website, (ii) learning activities, and (iii) pictures of various activities. In terms of Screen Design and Content, 8 items were at a high level ($\bar{x}$=4.12), in a sequence: (i) content and consistency, (ii) instructions and manuals, and (iii) overall screen. As for the usage aspect, 7 items were also at a high level ($\bar{x}$=4.14) from the highest to the lowest: (i) how to use it for a purpose, (ii) the interaction section and (iii) practice in the course.

5.1.6 The results of the interviews with students' opinions toward the prototype of a practical learning management system combined with case-based learning on educational resource administration in the digital era. There were five aspects in their opinions:

5.1.6.1 Knowledge and implementation: The participating students were positive to the constructed learning management system in teaching and learning educational resources management in the digital era at the graduate level.

5.1.6.2 Behavior and response: The participating students used the interaction section with the instructor and between learners together. Their practice in brainstorming, one-on-one discussion, group discussion, doing exercises and presentation of assignments, was supported by the search system and link sections to knowledge record for exchanging and sharing knowledge. The students were able to gain experience in designing strategies for developing educational resource management models for educational innovations as well.

5.1.6.3 Participation: The participating students found the system motivating and creating an atmosphere of exchange and knowledge transfer in social media, participatory operations, and case-based learning. The students were able to practice design and develop skills in building a modern educational platform.

5.1.6.4 Knowledge and Skills: The participating students were satisfied with the knowledge and skills applied to educational resources management in the digital era.

5.1.6.5 Problems and Suggestions: The participating students preferred to customize the screen by themselves. When in this course, they accessed social networks and practice sessions at times convenient to their needs.

5.1.7 System Performance Improvement

The research team synthesized the results of testing and trials of the system from the experts' quality assessment and the students' satisfaction assessment to improve the system's functional efficiency. Ten experts in ICT systems and education innovations were interviewed for feedback and suggestions for further improvements in system performance. The interview results were meant to improve interactive digital content, online interactions, techniques and methods for academic achievement.

5.2 Research Results on Objective 2

The researchers designed, created, tested the use and evaluated the constructed prototype of the practical learning management system combined with case-based learning on educational resource administration in the digital era. The learning system presented the teaching-learning digital methods with sufficient quality in recommending the system implementation for students at the graduate level.

6. Conclusion and Discussion of the Results

The research results can be concluded and discussed as follows:

6.1 Conclusion

(1) The research and development methods for the constructed practical learning management system combined with case-based learning on educational resource administration in the digital era were in four steps: (i) Analysis of user requirements, (ii) Design and development of systems, (iii) Functional testing and evaluation, and (iv) Improvement of system performance. The constructed learning system can support teaching and learning at the graduate level. The system provides operating sections consistent with the course content as well as case studies to enhance knowledge and understanding.

(2) The design and development of the constructed practical learning management system combined with case-based learning on educational resource administration in the digital era carry clear procedures and practices as responsive to students' needs for learning management in a graduate course.

(3) The efficiency of and satisfaction with the constructed practical learning management system combined with case-based learning on educational resource administration in the digital era, were assessed as positive by the ICT experts and the participating students.

(3.1) The efficiency of the system in the experts' opinions was at a high level ($\bar{x}$=4.14, S.D.=0.55), indicating that the constructed system functioned well as a tool for teaching and learning in the graduate course RED 7306 course.

(3.2) Overall satisfaction with the constructed system from the participating students' opinions was a high level ($\bar{x}$=4.15, S.D.=0.64), indicating that the students were positive to the learning management system on educational resources management in the digital era.

6.2 Discussion

The researchers discussed the major findings as follows:

(1) The developed learning system prototype was adapted from the research and development by Davenport & Michelman (2018), Panjarataanakorn & Phakamach (2020), and Kant et al. (2021) in five steps: (i) course content analysis; (ii) system design by ordering content classified by learning principles and resources in creating a virtual learning room and knowledge processing; (iii) the development of the system used the principles of 4Is: Information, Interactive, Individual, and Immediate Feedback; (iv) the use of the system for teaching and learning via the online communication channels; and (v) testing for the efficiency of the system by the opinions of student users. These five steps worked well for the system design and development.

(2) The evaluation results by the ICT experts were positive at a high level, indicating good quality lessons systematically arranged via the ADDIE process. The media production relied on trials and modifications to be consistent with the research framework, as seen earlier in the work of Boonprom (2020), Phakamach et al. (2021), Demir et al. (2021), and Trivedi et al. (2022). However, this present study refined a compact learning management system with quick access to the subject contents, multimedia and graphics. Quick access to contents with resources, references and graphics was emphasized as giving more educational options (Phakamach & Chaisanit, 2019; Wachirawongpaisarn et al., 2020).

(3) The satisfaction assessment results by the participating students were in favor of the constructed learning management prototype on educational resource management in the digital era. The system can support learning management well as expected by the developers. Lyons & Bandura (2019), Daultani et al. (2021), and Singh et al. (2021) reported similar results from the model system of four elements: data source and content, support resources, discussion boards, online learning activities with case studies. Their virtual learning model was able to support learners under study well with high satisfaction.

(4) The interview results from the ICT experts pointed to good functions in the constructed learning system. Such interview data served to confirm the system's efficiency of a quality learning management system, as earlier used by Kant et al. (2021) and Tam (2022).

7. Suggestions

Based on the major findings, the researchers would like to suggest the following:

(1) A learning support system requires a qualified development team, such as teachers, educators, educational psychologists, programmers, and educational innovation and technology designers.

(2) For the learning management process to provide quick access and be cost-effective, there should be digital literacy training on browser programs or applications for users in support of self-study.

(3) Appropriate details should be fully prepared, such as the website, related case studies, and the interaction sections.

(4) The development of online learning systems should carry consistent fonts, graphics, quality sounds and multimedia for effective case-study learning and processing.

8. Further Research

The researchers would like to see further research into the inclusion of more elements on standard learning materials to suit users' learning styles. New digital platforms based on blended learning models and modern learning resources could be challenges for learning system developers.

To the researchers, the design and development methodology should deserve further elaboration for teaching and learning at the graduate level. Such R&D elaboration in the direction to facilitate case-based learning on selected digital platforms could provide good opportunities for continuing studies accessible to learners both in urban and suburban locations.

9. Acknowledgements

The authors of this paper would like to acknowledge the academic support from Rattanakosin International College of Creative Entrepreneurship (RICE), Rajamangala University of Technology Rattanakosin (RMUTR), and the Educational Innovation Institute, Promote Alternative Education Association, Thailand.

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ISSN 2821-9074 (Online)
ISSN 2730-2601 (Print)
RICE Journal of Creative Entrepreneurship and Management, Vol. 4, No.2, pp. 78-88,
May-August 2023

doi: 10.14456/rjcm.2023.12
Received 1.11.22/ Revised 25.07.23/ Accepted 15.08.23

Academic Paper

Guidelines for Organizing Computer Science Courses at the Elementary Level

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Abstract

Technology Learning, known as Mathematical Science, aims to provide students with learning and computing thinking skills. Analytical thinking for problem solving is a step-by-step and systematic application of computer science knowledge. Information and communication technology to solve problems are found in real life. Learning management and clear assessment will help all teachers—particularly those in science and computer--plan to manage teaching and learning effectively. In this paper, the author analyzed contents for a computer science course at the elementary level and divided them by four indicators in four parts: Part 1, Indicators related to *Problem Solving*. In the grades 1-3, students will be able to study simple problem solving. The use of various games allows students to practice problem solving skills by getting prepared before facing the real situation. Part 2 *Programming Metrics* is to take the problem-solving skills from Part 1 and put them in an algorithm. In the beginning it may be programming and using simple command cards; ready-made programs may be subsequently used to write introductory commands. Part 3 Indicators on the use of *Software Programs,* such as word processors (like MS Word) and data presentation programs (PowerPoint) which students use in various instructional settings; and Part 4 Indicators on using *Safe Information Technology*. The study provides guidelines for use and maintenance of the equipment, proper use of information technology in daily life, and understanding of students' rights, duties, and respect for others.

Keywords: *Curriculum, computing science, elementary, content classification, content indicators*

1. Introduction

The guidelines for Thai basic education management are required in accordance with the changes of economic world, society, culture, environment, and scientific and technological knowledge that is growing rapidly to develop and enhance the capacity of people and the country's competitiveness. Upgrading the quality of education and learning to the international standards are the goals of Thailand 4.0 and required skills in the 21st century. These are for students to maximize their potential to compete and live creatively in the global community.

The management of education for the development of quality people is to ensure that students develop their full potential and know how to think critically, solve problems creatively, and learn on their own to live in society happily (Jit-arun, 2007). The reform of the learning process to develop learners has been developed continuously and with quality agencies involved in the reform of the learning process at all levels must have a strong management in various operations that drive the learning reform in the organizational structure, corporate mission and behavior of personnel in the organization (Kerkhao, 2003)

The Ministry of Education Thailand (2017) has announced the improvement of learning indicators and content. The core learning subject group of Science is clearly prescribed according to the Core Curriculum of Basic Education BE 2551, by specifying the basic course of science and technology as computer science course. Teachers of science and computer subjects need to update their knowledge and skills to be able to organize the content, manage learning and handle assessment appropriately.

The course of computer science encompasses technology adoption and concepts in computational science and computer science applied in daily life as a basis to think, analyze and solve problems systematically and creatively, as well as to be able to create innovations that help improve the quality of life for a good future. Teachers need to provide learner-based instruction as a key method to create and develop learners with varied characteristics. Teaching and learning management focus on learners and encourage them to explore, discover and learn on their own. The subjects must be in line with students' individual abilities and needs under good guidance for educational management. Educational philosophy and learning theories help teachers identify eclectic approaches to suit learners' characteristics and learning styles effectively (Yuedtuk, 1999). Teaching with an emphasis on learners takes all learning aspects into consideration both physically, emotionally, socially, intellectually, in terms of knowledge, skills, and attitudes. Both intelligence and emotion will be developed in learners to be smart, good, and happy (Chaithieng, 2007).

In this paper, the author reports the guidelines for organizing computer science courses at the elementary level in Thai Basic Education.

2. Course Goals

The Institute for the Promotion of Teaching Science and Technology Thailand (2018) has set important goals for the development of learners in teaching and learning in computational science as follows:

(1) To use computational thinking skills in analytical and systematic thinking and problem solving.

(2) To acquire skills in searching for information, assessing, organizing, analyzing, synthesizing and applying information to solve problems.

(3) To apply knowledge in computer science, digital media, information and communication technology in solving real life problems in creative collaboration for the benefit of oneself and society.

(4) To use information technology and communication in a safe, knowledgeable, responsible and ethical manner.

The above goals are to help teachers to divide content and manage learning and assessment appropriately.

3. Content Classification

The example of content division in elementary school courses is given in detail by Ministry of Education (2017) with indicators in 4 parts as follows:

Part 1 *Indicators related to Problem Solving* in grades 1-3: students will be able to study and use simple problem-solving skills. The use of various games allows students to practice problem solving skills when faced with difficult situations.

Part 2 *Programming Metrics* takes the problem-solving concepts from Part 1 and creates them in the form of an algorithm. In the beginning, it may be programming using simple command cards. Later, there may be a program that can be used to write basic commands.

Part 3: *Indicators about the Use of Software Programs,* such as word processors (e.g., MS Word) and data presentation programs (MS PowerPoint), which help students to know how to use various commands well.

Part 4 *Indicators on the Use of Safe Information Technology* serve as the guidelines for use and maintenance of the equipment, proper use of information technology in daily life, understanding of users' rights and duties, and respect for the rights of others.

The content classification according to the four indicators above is shown in Tables 1-4.

Table 1: Part 1 Indicators Related to Problem Solving

Class	Indicators	Core learning content
Grade 1	1. Solve simple problems using trial and error, comparison. 2. Show a sequence of steps or simple solutions using images, symbols or text.	- Solving problems successfully can be done using troubleshooting steps. - Simple problems, such as maze games, spot the differences games. bag packing. - Show troubleshooting steps. This can be done by writing, telling, drawing, or using symbols. - Simple problems, such as maze games, spot the differences games, bag packing.
Grade 2	1. Show a sequence of steps or simple solutions using images, symbols or text.	- Show troubleshooting steps. This can be done by writing, telling, drawing, or using symbols. - Simple problems, such as 6-12 puzzles, dressing up for school.
Grade 3	1. Demonstrate a simple working algorithm or problem-solving using images, symbols, or text.	- Algorithms are steps used to solve problems. - Algorithm display. This can be done by writing, telling, drawing, or using symbols. - Examples of problems are Monopoly game, Snake and Ladder game, Tetris game, OX game, walking to the cafeteria, cleaning the classroom.
Grade 4	1. Use logical reasoning to solve problems. Working description and forecasting results from a simple problem.	- Logical reasoning is the use of all-encompassing rules or conditions to be considered in solving problems. Working description or forecasting the outcome - Different starting states will produce different results. - Examples of problems, such as OX games, calculated programs. Programs that have multiple characters and have different commands or communication with each other, school trip by various methods.

Class	Indicators	Core learning content
Grade 5	1. Use logical reasoning to solve problems. Working description forecasting results from a simple problem.	- Logical reasoning is the introduction of rules or conditions that cover all cases to be considered in solving the problem working description or forecasting the outcome. - Different starting states will produce different results. - Examples of problems, such as Sudoku, a number prediction program. Program to generate geometry based on input values. Organizing the Holiday. Homework place in the kitchen.
Grade 6	1. Use logical reasoning to explain and design solutions to problems encountered in everyday life.	• Step-by-step solutions will help you solve problems effectively. • Logical reasoning is the introduction of rules or conditions that cover all cases to be considered in solving the problem. • The concept of repetitive work and conditions. • Considering an iterative or conditional workflow is a method to help design an efficient solution. • Examples of problems, such as finding the desired page number as quickly as possible, guessing the number 1-1 million by answering correctly within 20 questions, calculating travel time. taking into account distance, time break point.

Table 2: Part 2 Programming Metrics

Class	Indicators	Core learning content
Grade 1	1. Write a simple program. by using software or media.	- Programming is the creation of a sequence of instructions for the computer to run. - Example programs, such as writing a program to order the characters to move, shrink, enlarge, change the shape. - Programming software or media, such as using instruction cards to show programming, Code.org.
Grade 2	1. Write a simple program by using software or media and check for program errors.	- Example program, for example, write a program to order the characters to work as they want and check for errors Modified to achieve the desired results. - Error detection. This can be done by checking the commands that report errors. Or if the results are not as you want, check each command one by one. - Programming software or media, such as using instruction cards to show programming, Code.org.
Grade 3	1. Write a simple program by using software or media and check for program errors.	- Programming is the creation of a sequence of instructions for the computer to run. - Example programs, for example, write a program that instructs the characters to repeat infinitely. - Error detection. This can be done by checking the commands that report errors. Or if the results are not as you want, check each command one by one. - Programming software or media, such as using instruction cards to show programming, Code.org.

Class	Indicators	Core learning content
Grade 4	1. Simple design and programming by using software or media and check for errors and fix them.	- Simple program design, such as storyboard design or algorithm design. - Programming is the creation of a sequence of instructions for the computer to run to achieve the desired results. If there is an error, check the operation one by one. When it finds the point where the result is invalid, keep editing until the correct result is obtained. - Examples of programs with stories, such as interactive stories, short cartoons, daily routines. animation. - Practice detecting errors from other people's programs. It will help develop the skills to find the cause of the problem better. - Programming software, such as Scratch, and logo.
Grade 5	1. Design and write programs with simple logical reasoning. Check for errors and fix them.	- Program design can be done by writing in text or flowcharts. - Designing and writing a program with comprehensive validation of all conditions in order to achieve the correct results that meet the requirements. - If there is an error, check the operation one by one. When it finds a point that makes the result incorrect, correct it until the correct result is obtained. - Practice detecting errors from other people's programs. It will help develop the skills to find the cause of the problem better. - Example programs, such as programs to check even numbers, odd numbers, programs to get weight or height information and show the proportions of the body. The program instructs the character to fulfill the specified conditions. - Programming software such as Scratch, and logo
Grade 6	1. Simple design and programming to solve everyday problems. Check for program errors and fix them.	- Program design can be done by writing in text or flowcharts. - Design and write programs that use variables, iterations, condition checks. - If there is an error, check the operation one by one. When it finds a point that makes the result incorrect, correct it until the correct result is obtained. - Practice detecting errors from other people's programs to improve your root cause skills. - Example programs, such as game programs, GCSE valuation programs, and typing practice games. - Programming software, such as Scratch, and logo

Table 3: Part 3 Indicators about the Use of Software Packages

Class	Indicators	Core learning content
Grade 1	1. Use technology to create, store and retrieve information for the intended purpose.	- Basic software operations, such as entering and exiting programs, creating files, storing files, retrieving files. This can be done in programs, such as word processors and graphics program presentation program

Class	Indicators	Core learning content
		- Systematic creation and storage of files allows them to run. Find information easily and quickly.
Grade 2	1. Use technology to create, categorize, search, store, and retrieve information for the purpose.	- Basic software operations, such as entering and exiting programs, creating files, storing files, and retrieving files. document editing. This can be done in programs, such as word processors, graphics program and presentation program. - Creating, copying, moving, deleting, renaming, categorizing files and the folder systematically will make it run. Find information easily and quickly.
Grade 3	1. Use the Internet to search for knowledge.	- The Internet is a large network that makes communication easier and faster and is a source of knowledge that helps in learning and life. - A web browser is a program for reading documents on web pages.
		- Internet browsing. This can be done using a search site. And must define the appropriate search terms to get the information as needed. - Knowledge information, such as cooking methods, origami methods, information on Thai history. (It could be knowledge of other subjects or subjects of interest at that time.) - Safe use of the Internet should be under the supervision of teachers or parents.
	2. Collect, process and present information using the software for the intended purpose.	- Data collection. This can be done by specifying the desired topic. Prepare a recording device. - Simple processing, such as compare, group, and sort. - Information can be presented in many ways as appropriate, such as telling, documenting, reporting and making notice board - Use of the software works for its intended purpose, such as using presentation software. or graphics software. Create an image chart. Use word processing software to make announcements or white papers. Use table software to process data.
Grade 4	1. Use the Internet to search for knowledge and assess the reliability of the information.	- Using keywords that are relevant, concise, will result in fast and relevant results. - Assessing the credibility of the information, such as considering the type of website. (Government agency, news agency, organization). Author Date published reference information. - When getting the information you need from different websites, the content must be considered, compared, and then selected information that is consistent and relevant. - In making reports or presenting information, the information must be compiled, summarized, in its own language that is appropriate for the target audience and the method of presentation. (Integrated with Thai language course.)

Class	Indicators	Core learning content
	2. Collect, evaluate and present data and information, using a variety of software to solve everyday problems.	- Data collection This can be done by specifying the desired topic. Prepare a recording device. - Simple processing, such as compare, group, sort, and sum. - Analyze the results and make possible alternatives. Evaluate options (compare, judge) . - Information can be presented in a variety of ways as appropriate, such as tell-tales, whitepapers, posters, presentation programs. - Using the software to solve everyday problems, such as exploring the lunch menu using questionnaires and collecting data. Use spreadsheet software to process the data. Gather information about nutritional values and create a 5-day meal plan. Use the software to present alternative food item survey results and nutrition information.
Class	**Indicators**	**Core learning content**
Grade 5	1. Use the Internet to search for information. Communicate and work together. Assess the reliability of the information.	- Internet search and consideration of search results - Internet communication, such as e-mails, blogs, chat programs. - letter writing (Integrated with Thai language course) . - Using the Internet for communication and collaboration, such as for scheduling in group meetings. public relations activities in the classroom knowledge exchange study opinion under the supervision of a teacher. - Assessing the reliability of the data, e.g., data integrity from multiple sources: Author, date of publication of information. - Good information must contain all details, such as advantages and disadvantages, and benefit and harm.
	2. Collect, evaluate, and present objective data and information using a variety of software or Internet-based services to solve everyday problems.	- Gathering, processing, making choices, and evaluating results will provide information for effective problem solving or decision-making. - Using a variety of software or Internet-based services to collect, process, choose, evaluate, present, provide solutions to problems quickly, accurately, and accurately. - Examples of problems, such as photographing and exploring local maps to suggest ways to manage empty spaces. Take an online poll and analyze data, present data by using blog or web page
Grade 6	1. Simple design and programming to solve everyday problems Check for program errors and fix them.	- Program design can be done by writing in text or flowcharts. - Design and write programs that use variables, iterations, and condition checks. - If there is an error, check the operation one by one. When it finds the point where the result is invalid, keep editing until the correct result is obtained.

Class	Indicators	Core learning content
		- Practice detecting errors from other people's programs to improve your root cause skills. - Examples of programs, such as game programs, GCSE valuation programs, and typing practice games. - Programming software, such as Scratch, and logo.
	2. Use the Internet to search effectively.	- Efficient search. It's the quickest way to find the right information from multiple reliable sources and the data is consistent. - Using advanced search techniques, such as operators. Specifying data formats or file types. - Ranking of search engine results. - Compilation Summary (Integrated with Thai language course).

Table 4: Part 4 Indicators on the Use of Safe Information Technology

Class	Indicators	Core learning content
Grade 1	1. Use information technology safely. Comply with the computer sharing agreement. Basic equipment maintenance use properly.	- Safe use of information technology, such as knowing personal information. The dangers of disseminating personal information and do not share personal information with anyone except parents or teachers. Notify stakeholders when they need help with usage.
		- Guidelines for use and maintenance of the device, such as not writing on the device, cleaning, using the device properly. - Proper use, such as correct sitting position. Resting your eyes when using the device for a long time Be careful of accidents in use.
Grade 2	1. Use information technology safely. Comply with the computer sharing agreement. Basic equipment maintenance use properly.	- Safe use of information technology, such as knowing personal information. The dangers of disseminating personal information and do not share personal information with anyone except parents or teachers. Notify stakeholders when they need help with usage. - Guidelines for use and maintenance of the device, such as not writing on the device, cleaning, using the device properly. - Proper use, such as correct sitting position. Resting your eyes when using the device for a long time Be careful of accidents in use.
Grade 3	1. Use information technology safely. Comply with the terms of use of the Internet.	- Safe use of information technology, such as protecting personal information. - Seek help from teachers or parents. When there is a problem in use. When you find information or people that make you uncomfortable. - Compliance with the terms of the use of the Internet will cause no harm to oneself and others, such as not using profanity, ridicule, insulting, causing damage or regret to others. - Advantages and disadvantages of using information and communication technology.

Class	Indicators	Core learning content
Grade 4	1. Use information technology safely understand their rights and duties respect for the rights of others. Notify relevant parties when inappropriate information or persons are found.	- Safe use of information technology, understand their rights and duties. Respect the rights of others, such as not making false statements and sending them to others. Don't cause trouble to others by sending spam. chain message. Forward posts with other people's personal information. send game invitation. Do not access other people's personal information or homework without permission. Do not use someone else's computer/account name. - Communicating with manners and knowing the time. - Protection of personal data, such as logging out of the system at termination. Don't tell your password. Does not give identification number.
Grade 5	1. Use information technology safely, be polite, understand their rights and duties. Respect for the rights of others. Notify relevant parties when inappropriate information or persons are found.	- The dangers of use and cybercrime. - Internet communication etiquette. (Integrated with related subjects)
Grade 6	1. Use information technology to work together safely. Understand their rights and duties. Respect for the rights of others. Notify relevant parties when inappropriate information or persons are found.	- The dangers of use and cybercrime. Prevention guidelines: - How to set a password? - Assigning licenses (Access rights) . - Malware detection and prevention guidelines. - The danger of installing software on the Internet.

It should be noted that there is also integration between content, such as Programming (Part 2) and Problem-Solving Design (Part 1) or Using Software Proposing a Solution (Part 3) and Programming (Parts 1 and 2).

4. Analysis

4.1 Teacher's Role

From the new curriculum of Thai Basic Education, technology learning has been added to the science subject group. Some educational institutions are confused about the content distribution. For science and computer teachers regarding the management of teaching personnel, the prescribed curriculum is also a model in which teachers and graduates of teaching science should follow in their majors and rely on the indicators in various subject areas on teaching duties. The teacher’s roles can correspond with four indicators: responsibility for laying the groundwork in Part 1 on problem solving skills, the adoption of programming languages and software applications including the use of safe information technology in Parts 2-4.

4.2 Learning Management

The content in Part 1 is about solving problems; students will practice observing situations in daily life including the situation in question for practice in analyzing to solve a simple problem by trial-and-error comparison to logical reasoning in solving a particular problem. A sequence of steps for solving problems, such as using pictograms or software to describe the sequence of such steps. Teachers can use problem-based learning management (PBL) or a 5-step problem-solving process (5Es).

The content in Part 2 on programming is meant for the teacher to manage teaching in the course that has the learner in focus to create a sequence of instructions. (programming), and use simple classroom materials, such as instruction cards show programming design, using Storyboard or Algorithm design. Another form is the use of software packages to help with programming, such as Scratch and logo, as well as students' practice in programming through websites, particularly Code.org.

The content in Part 3 familiarizes learners with the use of various software programs in collecting, evaluating, and presenting information to solve everyday problems. Through websites and various graduate programs, educational institutions are to provide resources that facilitate learning, such as computers, Internet signal system and related programs, both computer programs and applications via tablets or mobile phones. Teachers are to organize learning to give students the opportunity to practice computer and problem-solving skills through demonstrations or self-study in preferably the flipped classroom.

The content in Section 4 on using Safe Information Technology emphasizes the rights and duties of oneself and others. Teachers may use a learning management model, such as a case study or simulation to provide students with the opportunity to discuss, brainstorm, and collaborate in pair work and cooperative learning activities.

4.3 Evaluation

As for learning performance assessments, teachers may include authentic assessments, practical skills exercises and classroom participation in problem-solving design as in Section 3. Assessment should be based on performance on programming as in Section 2, reporting on searched information as in Section 4, or project development on problem solving design and presentation which integrates the contents of Parts 1-4.

4.4 Final Point

Content classification according to the use of metrics as shown in this paper is to ensure consistency in the division of roles and duties of teachers together with learning management and evaluation. The use of metrics as such definitely allows teachers to design learning management clearly and effectively.

5. The Author

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Sharing Professional Viewpoint

The Impact of Smartphones on Face-to-face Communication Skills and Social Interactions

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1. Opening Point

In today's world, smartphones have become an indispensable part of our daily routines. More and more people are using them for various purposes, including staying connected with others, entertainment, and work-related activities. However, this growing reliance on smartphones has resulted in a decline in face-to-face communication skills, which in turn, is harming our social interactions. Research shows that using smartphones excessively can lead to a reduction in empathy, social skills, and the ability to read nonverbal cues, all of which are crucial components of effective communication (Lim et al., 2016; Common Sense Media, 2019). This essay argues that the overuse of smartphones is contributing to the deterioration of face-to-face communication skills and hurting our social lives.

2. Discussion

The use of smartphones can impact our social development. As known, smartphones have become a crucial component of our everyday lives in the current era of technology with their convenience and ease of access, and the excessive use of smartphones has harmed our face-to-face communication skills extensively. A significant drawback of relying on smartphones is the loss of nonverbal cues, such as eye contact and body language, which are vital for effective communication. Numerous studies indicate that overusing screens can cause a decrease in the capacity to recognize facial expressions and interpret body language, making it difficult to convey and understand messages accurately (Lim et al., 2016).

Smartphones have also contributed to a decrease in opportunities for face-to-face communication. People often use their phones as a means of communication, even when they are in the same physical space as others. This phenomenon has been referred to as "phubbing," which is the act of ignoring others in favor of one's phone. As a result, face-to-face conversations have become less frequent, leading to a decline in social skills. Smartphones have become increasingly prevalent in our lives and have had a significant impact on the way we communicate with each other. As per a survey by Common Sense Media in 2019, American teenagers are spending an average of 7 hours and 22 minutes each day on screens, including smartphones. Shockingly, just 33% of teens reported having daily face-to-face conversations with their peers. These numbers demonstrate the extent to which smartphone use has substituted face-to-face communication. The excessive use of smartphones has led to a deterioration in face-to-face communication skills, resulting in a decrease in nonverbal cues and opportunities for personal interactions. This, in turn, has had a negative impact on social interactions (Common Sense Media, 2019).

The decline in face-to-face communication skills, as a result of smartphone use, has hurt social interactions. Face-to-face communication allows individuals to connect on a deeper level, leading to meaningful relationships. However, the decrease in face-to-face communication has led to a lack of social interactions, which can result in feelings of loneliness and depression. Studies have shown that the lack of social interactions due to a decline in face-to-face communication can lead to negative mental health outcomes. Research conducted by the American Psychological Association found that social isolation and loneliness can have detrimental effects on an individual's mental health, leading to depression, anxiety, and other related disorders (Lim et al., 2016). In addition, social media have become a substitute for face-to-face communication, but it doesn't offer the same level of depth and richness as in-person interactions. While social media platforms allow communication, they are often superficial and lack the nuances and personal connections of face-to-face interactions. Social media interactions are usually brief, impersonal, and often lack emotional depth. As an illustration, a study published in the American Journal of Preventive Medicine in 2017 discovered that young adults who spend more time on social media platforms feel more socially isolated than those who spend less time on them. This research highlights the negative impact of social media on social interactions and its association with feelings of loneliness and isolation (Boulton, 2018).

As a society, we must recognize the importance of face-to-face communication and make a conscious effort to prioritize it in our daily lives. By limiting screen time and promoting in-person conversations, we can improve our communication skills and strengthen our relationships. The reduced ability to engage in face-to-face communication due to the use of smartphones also has a notable effect on professional environments. Effective communication skills are crucial for success in the workplace, and the lack of face-to-face communication can lead to misunderstandings and misinterpretations. Research has shown that communication skills are essential for career success. According to a survey conducted by LinkedIn in 2018, soft skills, including communication, were the most in-demand skills for employers. Effective communication is vital in the workplace, as it enables individuals to convey ideas, build relationships, and collaborate effectively with their colleagues (Petrone, 2018).

Furthermore, the lack of face-to-face communication can lead to misunderstandings and misinterpretations, which can negatively impact productivity and lead to workplace conflicts. The nuances of nonverbal communication, such as tone of voice and body language, can be lost in digital communication, leading to misunderstandings and miscommunications. For example, a misinterpreted email or text message can lead to an argument or conflict that could have been avoided through a face-to-face conversation. In a professional setting, such conflicts can lead to missed opportunities, damaged relationships, and reduced productivity. As such, it is essential to recognize the importance of face-to-face communication in professional settings and to make a conscious effort to prioritize it. By promoting in-person conversations and reducing reliance on digital communication, individuals can improve their communication skills and foster better relationships with their colleagues, leading to increased success and productivity in the workplace.

3. Counterpoints

While excessive use of smartphones may have negative impacts on face-to-face communication skills and social interactions, smartphones also offer various benefits, such as accessibility, convenience, and the ability to connect with people who are physically distant. In today's globalized world, smartphones have enabled people to maintain relationships with friends and family who are geographically distant. Moreover, smartphones have also facilitated online education, virtual meetings, and remote work, which have become increasingly important during the COVID-19 pandemic. Therefore, it is important to acknowledge the advantages of smartphones and use them responsibly, rather than demonizing them. It is therefore important for people to be aware of the excessive use of smartphones as affecting face-to-face communication skills and social interactions. The decline in nonverbal cues and opportunities for face-to-face communication could lead to negative impacts on both personal and professional relationships.

4. Closing Point

While smartphones offer various benefits, they should be used responsibly, and individuals must make a conscious effort to prioritize face-to-face communication. By limiting screen time and promoting in-person conversations, individuals can improve their communication skills, foster better relationships, and increase their success and productivity in both personal and professional settings. Ultimately, it is essential to strike a balance between the benefits and drawbacks of smartphones and to use them in a manner that enhances our lives rather than detracts from them.

5. The Author

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RICE Journal of Creative Entrepreneurship and Management (RJCM) has its focus on original contributions on research work or academic issues in the areas of creative entrepreneurship and management as practiced by academics or scholars in their fields of specializations in social sciences. Currently, it is classified as Tier 2 in Thai-Journal Citation Index (TCI). It is a double-blind three-peer-reviewed journal and each volume is published online-plus-print thrice a year: No.1 in April, No.2 in August and No 3 in December. Original research articles, academic papers and brief professional viewpoints for sharing will be included in this journal. The details and views expressed in the published papers are entirely the responsibility of those authors.

2. Submission of Manuscripts

Authors should submit a non-formatted WORD file of their manuscript in single spacing (see Section 3: For Authors below) to Editor-in-Chief 2 Ruja Pholsward <rujajinda@gmail.com>.

- The Office of the Editors-in-Chief is at Science and Technology Building, Floor 4, Rattanakosin International College of Creative Entrepreneurship, Rajamangala University of Technology Rattanakosin, Thanon Putthamonthon Sai 5, Salaya, Nakhon Pathom 73170, Thailand.

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3. For Authors

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Header: 0.5 inch	Footer: 0.5 inch

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illustrations. Each page should be clearly numbered in the bottom center of each sheet. Authors should carefully edit and proofread their manuscripts before submission.

3.2.1 The title: The **title of the article** must not exceed 2 lines. A title itself has to be informative and indicates the main topic in the article. The title should be set in the center of the page, using upper and lower case letters of Times New Roman 12 points and printed bold. If there is any symbol, its size must be the same as the text in that line.

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3.2.6 In-text Citations: Authors are to give references to all the information obtained from books, papers in journals, websites, or other sources. The Author-Date System should be used to cite references within the paper by using the author's last name and date (year), separated by a comma in parentheses; for example, name(s), year.

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3.2.10 Reference Lists: The final page contains a list of resources cited in the paper. The style of citations used in RJCM should conform to the American Psychological Association (APA). It is the author's responsibility to ensure the accuracy of all references cited in the paper. References should be listed in alphabetical order using regular Times New Roman 11 points.

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Books

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Author.//(Year of publication).//*Title*.//Edition (if any).//Place of publication: Publisher.

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Format:
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Websites
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http://www.goodreads.com/quotes/tag/action-learning, January 18, 2017.

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The length of the unformatted manuscript in WORD can be 15-25 pages in length including references. The contents of the manuscript should include (1) a title with the author's name, affiliate, email address and telephone contact, (2) an abstract of 150 words with 3-5 keywords, (3) an introduction, (4) a rationale and background of the study, (5) research objectives, (6) research methodology, (7) data collection procedure, (8) data analysis, (9) results and discussion, (10) research limitation (if any), (11) conclusion, (12) acknowledgement(s) (if any), (13) the author's biography of about 50-80 words, (14) references, and (15) an appendix or appendices (if any).

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