Reflective Keys of Integrative Research Studies in A Graduate Design Management Program, Thailand

Jitiporn Wongwatcharapaiboon[1]*, Akapan Thienthaworn[2] and Adi Pramono Budiwan[3]

[1,2] Design, Business and Technology Management Program, Faculty of Architecture and Planning, Thammasat University, Pathumthani, Thailand

[3] Faculty of Information Technology, Universitas Surabaya, Indonesia

* Corresponding author e-mail: jitiporn@ap.tu.ac.th

Abstract

This research aims to investigate the keys of research learning based on advanced-case studies in the graduate Design, Business and Technology Management (DBTM) program, Thammasat University, Thailand. Specifically, these advanced case studies are previously completed theses selected to represent certain research typologies that reflect the program goals. The program takes a novel approach in motivating students to creatively pursue their own research questions by engaging them with in-depth group discussions, content presentations from academic and practitioner experts, authentic, project-based practices in collaboration with different private and public-sector stakeholders, and the advanced research case studies. The methodology of this paper follows a qualitative research approach that relies on Stufflebeam's CIPP model consisting of context, input, process and product elements. Along with class activities, the context of programs and learning types are first explored in relation to class and research inputs from 7 advanced case studies (theses) that focus on different components of the DBTM program. Then, the process of using focus groups in the classes to provide the students with exposure to authentic research experiences, culminating in their own research proposal presentations is discussed. Each of the student's research proposals must include elements of multi-context research and are evaluated by a faculty committee and external experts, based on the study themes of DBTM and learning types. Most students tend to focus more on design and business concepts in their research proposals with less emphasis on the technology and management fields. A reflective key of the case study approach is the learning of a combination of cognitive, meaning and connectivism concepts to improve research understanding. To support this pedagogical approach, class activities are delivered through a combination of short lectures, sharing discussions for meaning learning, and well-rounded literature review for connectivism learning. These key findings contribute directly to the sustainable development of the master's curriculum in the Design, Business and Technology Management program.

Keywords

1. Introduction

Design has an essential role in addressing the increasingly complex, multidisciplinary challenges facing modern society, ranging from new product development, to community sustainability, liveability, and resiliency, to climate change. The design process has become more important, not only for the design arts, but also the business and technology sectors. Today's business and economic model requires people with creative thinking who can design, manage, and fulfil ever-increasing demands. At the Master's level in universities, students can explore insight visions to guide their research and match suitable methodologies to their research skills, knowledge results, and desired career paths. The Design, Business and Technology Management (DBTM) Master's program at Thammasat University, Thailand, provides knowledge to focus on intense issues such as sustainability, research methodologies, and management, and guides the students on how to apply the knowledge to their own research studies. The program is conducted through discussion, project-based practices, and research case studies motivating students to creatively address authentic business problems (Design, Business and Technology Management, 2018). We take a mixed methods approach to teaching the 36 credits of study in DBTM, including lecture-based, seminar-based, and project-based methods, culminating in an individual research project or thesis. For lecture and seminar-based subjects, the main content covers 'Urban Futures' to provide a well-rounded understanding of the urbanization process and the rise of world challenges. In addition, courses are provided that relate to 'Design Strategy and Planning' where students can examine complex integrative projects in the Design, Business and Technology Management fields; as well as courses in the areas of 'Project Organization', 'Project Sustainability' and 'Project Risk Management' that deliver a holistic understanding of the multi-faceted approaches to reliable solutions for various types of business challenges. The program structure also is nimble enough to address trending situations and implementations through the lecture-based classes of 'Special Topic' and 'Research Skill of Enquiry'. All introductory course content is developed to ensure consistency (LaVelle & Davies, 2021) across the mixed expertise of instructors, graduate market, and academic program partners in the public and private sectors.

Based on the studied course content, the initial year 1 student research proposal is one process in the 'Research Skill and Enquiry' subject that aims to help students conduct a research project or thesis at at the Master's level. For the DBTM Master's class, advanced case studies that are the research products (project or thesis) from previous Master's batches, focus on real problems in the context of conducting research to address these problems. This advanced case study approach is intended to deepen the understanding of theoretical frameworks and analytical techniques for the year 1 Master's students s to support them in producing a clearer and more enlightened proposal for their own research project or thesis. Based on the background provided in the foregoing discussion, this study aims to investigate the key elements of research learning following the context, input, process, and product (CIPP) model and analyse research output on the design, business and technology management fields as produced by year 1 DBTM Master's students. There are some learning theoretical contents in the next session explaining relatively learning behaviours in research class. To address this objective, we begin by examining the pedagogy of different learning theories as they pertain to research, with a specific focus on the use of case studies. This discussion is followed by our study methodology, results and discussion that focus on the CIPP theory of research learning and examines 7 DBTM Master's theses (advanced case studies) to illustrate the application of the CIPP theory in the program and how the advanced case studies can be used to guide new Master's research proposals.

2. Initiative Theory and Case Studies

2.1 Theorical Learning

Theorical learning is a set of different approaches which can describe, explain and observe an individual's learning process and everything that relates to the process. The following is a summary of the learning theories presently applied in the academic world.

Cognitive learning theory: Cognitivism studies focus on how our mind processes, interprets and stores information (Bartolomei-Torres, 2019). In this theory, the individual student is an active entity in their learning process. Cognitive learning relies on understandable content and the instructional process. Learners can have opportunities from lecturers to ask questions, learn from failure, and think outside of the box (Western Governors University, 2020).

Meaningful learning theory: The theory characterizes the relationship between human beings and the new knowledge he/she possesses. Meaningful learning is based on acquiring quality learning by understanding the concepts of a topic so that this can be used to make connections with other previously known knowledge, thereby deepening the understanding of a topic. On the contrary, memory learning focuses on memorizing concepts without understanding (Bartolomei-Torres, 2019).

Connectivism learning theory: Connectivism learning theory focuses on the concept that peers can learn through their interactive connections by sharing opinions, viewpoints, and ideas in a collaborative process. Furthermore, while the connections might be with peers, the connections also might be related to their responsibility and roles in their lives. Objectives, desires, hobbies, and people can connect and provide an impact on the learning field (Western Governors University, 2020).

Case study research: Case study research allows students to understand and explore complicated issues in a deeper way by focusing on the details of a particular case. Of course, challenges arise in drawing generalizations about a process or population based on this small sample that is subjectively selected for study. However, by using a case study approach, researchers can obtain fine-grained appreciation of the study landscape that is beyond the quantitative statistical results. Ultimately, with both quantitative and qualitative data, a case study helps explain both the process and result of the case through comprehensive observation, reconstruction and also case analysis under investigation (Zainal, 2007).

According to the context of research learning in the DBTM classes, these learning theories are applied to providing basic information, research knowledge and knowhow, research structure, the relationship of specific fields of study and the research process, and practical case studies. In the next section we examine in more detail, the important idea of advanced case studies to better understand the research and design process.

2.2 Advanced Case Studies of Knowledge and Context Integrations

After the introductory courses that focus on learning about the research process cognitively and the importance of connectivity research, 7 advanced case studies are examined that pertain directly to the next steps of developing a research proposal. It is noted that these case studies are research projects/theses that have been successfully completed by earlier batch DBTM students. The characteristics of these 7 case studies (numbered E1 to E7) as they pertain to the DBTM research and design philosophy are summarized in Table 1. These case studies were selected to provide concrete examples of the theorical contents for cognitive and meaning learnings, research aim and objectives for empirical connectivism and various methodologies for

applying case studies under the core area of the DBTM program. More specifically, there are four study fields for each research input and research outcome field. Relying on outcomes of research, three types of relationships are found between initiative conceptual and outcome fields as shown in row and column descriptions in Table 2.

Table 1. Comparative matrix between input and outcome of seniors' research field.

Research Outcomes' Field	Initiative Conceptual Field			
	Design	Business	Technology	Management
Design	E2 – Create a board game to involve the first job holders from Bangkok in active learning about their financial plans to achieve well-being in retirement	E5 – Develop service design for Thai hostel business to improve customer experience	E7 – Develop a digital platform design to help architects in choosing green construction materials	E4 – SATI utilization to improve Thai farmers' well-being
Business	E1 – Understanding the customer experience in support of creating design guidelines for Thai restaurants in the United States			
Technology				
Management	E3 – Create service design to reduce food waste in the independent Japanese restaurant business in Thailand		E6 – Utilizing management and design thinking to develop a sharing platform for leftover furniture	

Note: Technology outcome are not appeared in advanced case studies.

The first group of case studies provided design outcomes from different research initiatives. For example, the E2 case was researched purely based on design concepts for first job holders to understand financial plans better. The students used a board game with first job holders in Bangkok so they could have active learning to plan their financial life for achieving well-being and a comfortable retirement in the future. Also, the E5 case implemented a design concept for hostel businesses to improve the customer experience. The student developed a service blueprint that is used as a tool to understand the whole service process of the hostel business and analyse the business opportunity with the goal of achieving customer satisfaction. The E7 case developed the design of an online platform to help architects more easily find good quality green building materials. This study used a 3-stage process to identify the issue that architects or designers encounter when choosing green construction materials, with the aim of designing the digital platform to help disseminate information to the architects and designers. The 3 stages included development of case studies of existing platforms to find out their strengths and weaknesses, design the digital platform, and test the platform functionality. The E4 case used management concepts combined with a design approach in an effort to improve farmers' well-being. The students formed a method named Smarter Agriculture Thai Initiative (SATI) to provide farmers with information about the advantages, management issues, and risks in pursuing organic farming to achieve long-term business and increase the well-being of Thai farmers.

The second group of advanced case studies highlighted business outcomes from the design initiative concept. The E1 case study conducted research based on design and business with the aim of customer satisfaction. The student created design guidelines to improve the customer experience for Thai restaurant businesses in the United States. There is no technology outcome from senior research.

Thirdly, research outcomes of management concept could be possible from design and technology initiative concepts. For example, the E3 case study utilized design and management concepts with the goal of food waste reduction. The student created a service design to manage and reduce food waste in the Japanese restaurant business. The E6 case study used management and design thinking processes for a technology initiative to create a sharing platform for leftover furniture and decorations. The circular economy concept was used for better waste management and to obtain insights into digital platform design ideas. Also, the design idea was developed using data collected from a large online survey.

By exploring these advanced case studies, the year 1 Master's students will learn about appropriate research methodologies that will help to support the development of their own research ideas and plans.

3. Methodology

In-class activities relied on 4 stages of the CIPP model: (1) context, (2) input, (3) process and (4) product. This model can be applied to various research frameworks with various purposes (Azari & Kim, 2015) especially for developing decision guidelines, assessing level of research integration, and curriculum improvement ((Hasan et al.,2015; Poth et al., 2020; AbdiShahshahani et al., 2015) etc. For this research, the CIPP model assisted us with investigating and crystalizing keys of research learning for multiple research fields in the DBTM program. Focus groups that provide insightful presentations and discussions around the 7 advanced case studies are structured 7 times through the 'Research Skill and Method of Enquiry' class syllabus. Ultimately, the output and outcome of class activities culminates in a research project or thesis proposal. For the purposes of this paper we summarize these outcomes by analyzing 15 research proposals subsequently submitted by the year 1 Master's students. The criteria of evaluation in analyzing these 15 research proposals focus on contextual fields of design, business and technology management and types of learning. This type of review can contribute to research class improvement and curriculum adjustment.
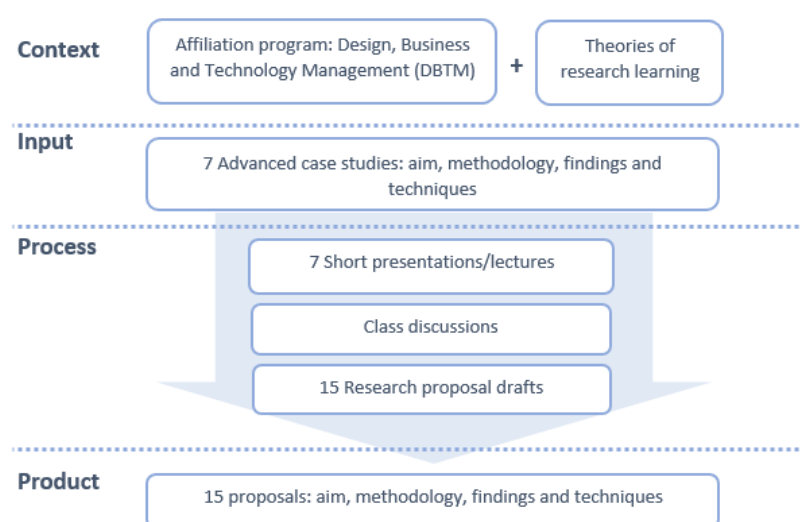
Figure 1 Research framework based on CIPP model.

Figure 1, illustrates the context, input, process and product steps of the CIPP model as they relate to the DBTM program (see also Hakan & Seval, 2011). To start with, in the context of a research class, a large frame of learning context should be explained (King & Clinton, 2022). Then, both program background and learning theories need to be clarified. The background of the DBTM program includes basic subjects and tools for each field of the 4 study areas design, business, technology, and management. Also, various types of learning theory support class activities and class experiences.

The Input section of the CIPP framework includes the 7 advanced case studies of knowledge integration, as described above. By implementing the theory of case studies research, students can deepen their understanding of conceptual background, structure, and research methods. The 7 advanced case studies of knowledge integration from the senior students are presented in class with different topics, purposes, objectives, and outcomes. Therefore, year 1 students continually learn research processes from different perspectives in the pursuit of creating their own research topics.
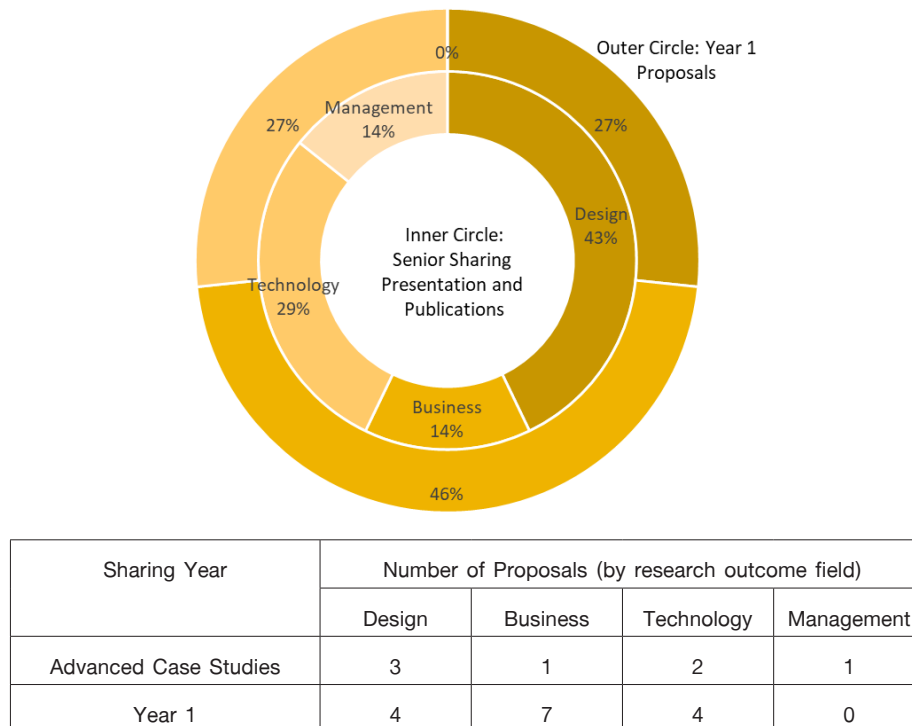
The Process of student presentations allows them to create a proposal, develop methodologies, and explore outcomes using various research techniques. Students are expected to have ideas for their research proposal after learning from the different advanced case studies, create their methodology for the research, find the issue to be solved that people encounter these days, and think innovatively to solve the issue with their own research techniques.

The Product aspects of CIPP cover the research study of the year 1 students as a whole. By understanding the knowledge above, students are able to develop their own research method and comprehend the content structure for the study. The research should cover the main topic, purpose, objectives, methodology, and outcomes. The thematic mapping method (e.g. Braun and Clarke, 2006) and decoding structure are applied to identify research answers and comparative discussion in a qualitative sense. In the analysis criteria section, students will analyse their research based on design, business, technology, and management. The concepts they utilise in the research should be in combination with those four aspects.

In this study, we review 15 proposals submitted by year 1 students which have different topics, purposes, objectives, methodology, and expected outcomes. The comparisons of the 15 proposals can be used as a guidance to learn ideas from the different perspectives of students about how they can use their own approach to solve existing issues.

4. Results and Discussions

As noted, 7 advanced case studies are examined in the early stages of the research class which separated research fields into the design fields (3 case studies, business field (1 case study), technology fields (2 case studies), and management field (1 case study). From these sample cases, reflections can be decoded by the year 1 students in the research class. Based on the data of the 15 year 1 students' proposals in Figure 2, 27% of the students used a design approach, 46% used a business approach, and 27% used a technology approach. Based on the data from the advanced case studies of the senior students, 43% of the students used a design approach, 14% used a business approach, 29% used a technology approach, and 14% used a management approach.

Sharing Year	Number of Proposals (by research outcome field)			
	Design	Business	Technology	Management
Advanced Case Studies	3	1	2	1
Year 1	4	7	4	0

Figure 2 Proportion of research papers separated by research field.

In matching up with the 7 advanced case studies (E) in Table 2, the 15 year 1 proposals were submitted covering 5 research categories under the final outcome, including: (1) proposals with mixed initiative concepts having design and business outcomes (4 proposals), (2) proposals initiated under the business concept that ended up more focused on design (4 proposals), (3) proposals initiated under a business concept and that ended up more focused on technology outcomes (3 proposals), (4) proposals that started with technological concepts and business outcomes (3 proposals), and (5) proposal that started with technological concepts and having management outcomes (1 proposal).

Table 2. Comparative matrix between input and outcome of research fields in class.

Research Outcomes' Field	Initiative Conceptual Field			
	Design	Business	Technology	Management
Design	(E2)	(E5) (2) ●●●●	(E7)	(E4)
Business	(E1) (1) ●●●●		(4) ●●●	
Technology		(3) ●●●		
Management	(E3)		(E6) (5) ●	

In research category 1, application of design concepts is required to improve brand loyalty. Students study what customers want to have from a business, customer expectations that a business should deliver to fulfil customer needs. By knowing their needs, students can formulate service and process design to create a suitable product for the market to increase brand value, maintain and expand market share. Ever-changing needs force students to think creatively in order to produce innovate design concepts to make a business go to the next level beyond competitors (Pattamaprapanon et al., 2021; Kamolnate et al., 2021; Rungruangkollakit et al., 2021; Srisa-ard et al., 2021).

In relation to customer satisfaction under research category 2, students considered marketing techniques and the business model, which are essential parts of creating a customer-perspective product. A good business should focus on customer, focus on what a customer wants and develop approaches in a marketing strategy to achieve customer satisfaction. If customers do not have a positive experience with a business, the business risks losing new and returning customers, therefore the business model has an important role besides a marketing strategy. Students learn about the need to address customer satisfaction, including gathering feedback to understand customers more, and creating personalized products and customer support. Students also learn about a business model, which takes a holistic approach to design of business operations from the customer base, product, to financing details (Suwana-adth et al., 2021; Kunkhett et al., 2021; Sutthichaisorakul et al., 2021; Asawathitirat et al., 2021).

To improve the customer experience, students consider digital platform development in research category 3. In this digital era, change is happening faster than ever. More and more people access the internet, and most of them millennials, look for information and products they need. For business growth, most businesses have moved from the traditional way to digital platforms to get new customers. Therefore, students should comprehend and analyse behaviours that make customers decide to purchase products online and also learn characteristics of existing digital platforms that are successful and sustainable. Based on the understanding of those aspects, students can create essential features of digital platform design that will have an impact on customer purchasing decisions (Roongrattanakul & Thienthaworn, 2021; Imyen et al., 2021; Mekdusadeerom et al., 2021).

The majority of companies in all categories view the digital platform industry as an opportunity for business growth in research category 4. Students explore what kind of marketing, product or service can be done digitally, given the dramatic growth in the digital economy. Students are encouraged to have a good understanding of the industry and think creatively so they can develop innovative strategies for digital marketing, product, and service delivery. Digital marketing strategies that students can learn include social media platforms, content marketing, influencer marketing, search engine optimization (SEO), pay-per-click (PPC), email marketing, affiliate marketing, and mobile marketing. Students have to understand the core elements of a digital product strategy, which are the vision, challenges, outcomes, action, and measures of creating for digital a product. In achieving customer satisfaction, students should have good knowledge about digital service and develop strategies to increase customer experience while reducing live contact volume (Thanyamahasunthon & Wongwatcharapaiboon, 2021; Wongpittayanukul & Jamieson, 2021; Soonthonthai et al., 2021).

Aside from the business in research category 5, students also studied Water Sensitive Urban Design (WSUD) technology to manage pluvial urban flooding. A Personal Computer Storm Water Management Model (PCSWMM) is used for analysing and modelling common types of stormwater management and design problems encountered in this practice (Teang et al., 2021). In this sense, there was an integration of engineering-oriented technology (dynamic mathematical modelling) to asses and optimize green design and thereby enhance policy, decision-making, and management.

Our analysis of the data presented above indicated that most students applied the theory of case study research to obtain research insights and scope for their research fields in Design, Business and Technology Management. The most impactful case studies are E1, E5 and E6, which the next generations (here, year 1 students) can understand and apply to develop research proposals in their own fields of interest. We also found that most studies utilized design or business concepts as the main research approach.

An unbalanced proportion of key research fields is found in the Design, Business and Technology Management program. The number of students should be balanced in the implementation of design, business, technology, and management; however, the data show that students place a greater emphasis on design and business rather than on technology and management. Independent variables and external factors possibly affect the research field selection in each class. For example, during the COVID pandemic, students mostly selected online surveys to be the main method of data collection linked directly to research fields. In comparison, Neyazi et al. (2016) found the interest and understandability of knowledge in a graduate class depended on labour market demand, indicating that the uncertainty dynamic of a future career can affect research fields.

Based on theories of learning, the learning keys of research for the recent Master's cohorts in DBTM are presented in Table 3. All processes of research learning start from 'how to do?' to 'how to present the outcomes?' that can be known from the advanced case studies and their presentations in class. To be strict to structure and all research contents, advanced year students' presentation pointed to the 1st step of cognitive learning from lecture, literature and research case study class. All contents in this state needs to be crystallised before applying to rationale and literature reviews. For finding their own research topic, year 1 students can adapt some of the methodologies presented in the advanced case studies, in combination with creating research interests from their familiar work and current contexts. By linking material from the advanced case studies with their own research interest and topic, the year 1 students undertook connectivism learning to identify rationale and background of their research.

Table 3. Conclusive research learning keys based on theorical learning types.

Theorical Learnings		Research Publications	
Types	Descriptions	7 AdvacnedCase Studies	15 Class Research Proposals
Cognitive	Experience via lecture, seminar and self-practice in class	● Backgrounds and rationale of research and all structural contents were presented in class.	● Some continued concepts of background and contents (e.g. customer experiences, service design research and technological platform). ● All contents need to be reviewed multiple times for crystalizing processes.
Meaning	Explain clearly research gap and research rationale	● Rationale of research normally relied on real (authentic) situations. ● Graduate faculty committee Q&A sessions was included as part of the presentation process.	● Rationale was quite similar to advanced case study research, but updated data and situations were required, pertinent to each of the 15 students' selected research project. ● Clear discussions of meaning understanding were included in Q&A session.
Connectivism	Linkable purpose of research to real life	● Based on real situations, all research outcomes were linked to their real life and business positions. ● Some parts of the literature review were presented in class.	● Up to date situation affected year 1 student research to be adjusted for their new situation (e.g. COVID situation, new normal of customer behaviour). ● Class activities and homework required to consume more current situations and finding their own preferred positions.
Case studies	Multiple learning combinations of above theories	● Research structure can be learned from cognitive class, where rationale and situation need to be interpreted based on real situations during research period.	● Year 1 students possibly adjusted advanced case studies by keeping research structure and contents of methodology to their research. ● Most backgrounds and rationales are started from their own interesting focus rather than continued from the advanced case studies.

Based on this case study method, key success factors of research learning in the DBTM Master's program

are (1) several reminders for cognitive learning, when (2) discussion is the best way to clarify relations and rationales of research. For connectivism learning, (3) the current situation and up-to-date literature need to be fully explored in class and through homework/assignment activities.

To compare connectivity with other professional program, understanding of class context and general current issues are the first priority of the research program (King & Clinton, 2022) when critical findings of lecture-based and current situation information are important for cognitive and discussion learnings of this research. These basic activities are mainly focussed on clear information and instruction for research background and class environment, while current situations can be analysed based on discussion and insight question and answer sessions. Moreover, lectures and presentations in class are trending to be delivered over shorter periods of time for more focussed and condensed information. Participants can have more class time to practice and ask for further clarification of points they misunderstand.

Research learning can be supported by class actions in work and practice to improve research quality and integrity for future works (Gullickson et al., 2019), self-assessments and reflections, discussion and practical implementation in small groups (Poth et al., 2020). From general research integration of the CIPP model, those class activities are similar to discussion and research activities related to research rationale. Small group discussion with seniors, colleagues and experts in class can more directly and clearly answer questions related to the year 1's future research.

5. Conclusions

The Design, Business and Technology Management program at Thammasat University emphasizes 4 research fields at the Master's level where expected research content should be integrated from various research fields. Within lecture and seminar classes, there are sharing sessions that focus on 7 senior theses (advanced case studies) which are reflected in the next-generation (year 1's) research proposals to compactly understand research skill and enquiry and advance their research content. Based on case-study context from seniors, year 1 students can gain knowledge insights in the creation of topic and content related to suitable research structure. Research case studies reflect directly on the next generation's research outcomes, which are monitored. In general, the program follows the 4 different components that form the CIPP model: context, input, transferring presentation process, and output product with analysis criteria.

Based on our review of 15 recent Master's theses, more than half chose concepts of design and business for their research content. This emphasis possibly results from a basic focus in the DBTM Bachelor's degree which is weighted mostly towards design and business content. The majority of Master's students in the DBTM program historically have been drawn from the DBTM undergraduate program. Master's students in the DBTM program frequently want to pursue an entrepreneurship focus in their research. Entrepreneurship is part of the business field and can creatively apply design, technological, or management approaches to their own business. For students that specialize in coding, they can develop applications based on design ideas in creating their software/applications or digital platforms. For a smaller number of students in class that focused on the technology management field, a basic knowledge of digital implementation is required, and with the exception of engineering and computer science, most Bachelor's level degrees will rarely focus on such details. Also, another insight finding of year 1 rationale, the study of community development can be marginalised organic agriculture activities to boost up local commercial products and business. This can conclude multiple dimension

of Design, Business and Technology Management in another sustainable development way forward. Consequently, this finding and research gap pointed to the need for increased focus on a managerial combination of design, business and technology content in future development of the Master's curriculum, when technology focus need to be supported by professional technician and business partners.

There are some key success stories of the research learning approach that relied on different activities in class. For cognitive learning sessions, several reminders help students remember all content, but discussion and homework literature review sessions are key successes for meaning and connectivism learning. All activities can be adapted from the advanced case study class, which lets current students feel relationships between 2 generations and challenges them to discuss all curious problems in class.

Our study can be a guideline for year 1 Master's students to understand the content of a research study, and also possible approaches to develop interesting ideas and appropriate topics for their own research in the scope of Design, Business, and Technology Management. To inform the steps of research that utilize the advanced case study approach, guidelines can start from sharing and discussing research cases between classmates and senior researchers. Then junior (year 1) students can learn and integrate how to approach the direction of expected outcomes scoped by the 4 DBTM areas. Also, specific research methodologies can be discussed in class which finally guides students to their future preferred directions. For sustainable development of the Master's research curriculum, all class activities should be balanced based on student learning keys: contents reminder, sharing discussion and well-rounded literature review. Consequently, advanced case study sharing sessions, which can scope all keys into class activities, are added into the research Master's class.

Acknowledgement

Author Contributions

Conceptualization, J. Wongwatcharapaiboon; methodology, J. Wongwatcharapaiboon., A. Thienthaworn and A.P. Budiwan; Validation, J. Wongwatcharapaiboon; formal analysis, J. Wongwatcharapaiboon and A.P. Budiwan; investigation, J. Wongwatcharapaiboon., A. Thienthaworn and A.P. Budiwan; resource, J. Wongwatcharapaiboon; data curation, J. Wongwatcharapaiboon., A. Thienthaworn and A.P. Budiwan; writing – original draft, J. Wongwatcharapaiboon. and A.P. Budiwan; writing – review & editing, J. Wongwatcharapaiboon; visualization, J. Wongwatcharapaiboon; supervision, J. Wongwatcharapaiboon; project administration, J. Wongwatcharapaiboon. and A.P. Budiwan; funding acquisition, J. Wongwatcharapaiboon. All authors have read and agreed to the published version of the manuscript.

References

AbdiShahshahani, M., Ehsanpour, S., Yamani, N., Kohan, S., & Hamidfar, B. (2015). The Evaluation of reproductive health PhD program in Iran: A CIPP model approach. *Procedia - Social and Behavioral Sciences, 197*, 88-97. https://doi.org/10.1016/j.sbspro.2015.07.059

Asawathitirat, P., Promsit, S., Boonyanan, A., & Mongkol, K. (2021). The study of product development for Kung-Sawei to develop new product features. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 867-876). Faculty of Architecture and Planning, Thammasat University.

Azari, R., & Kim, Y.-W. (2015). Integration evaluation framework for integrated design teams of green buildings: Development and validation. *Journal of Management in Engineering, 32*(3), 1-14. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000416

Bartolomei-Torres, P. (October 11, 2019). *Learning theories: Definition and characteristics every educator should know. Learningpb.* Retrieved March 22, 2021, from https://www.learningbp.com/learning-theories-definition-and-characteristics-every-educator-should-know/

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77-101. doi:10.1191/1478088706qp063oa

Chawpraknoi, B., & Boonyanan, A. (2020). Service design guideline to achieve the reduction of food waste in independent Japanese restaurants business in Thailand. *Built Environment Research Associates Conference 2020: BERAC 2020* (pp. 647-652). Faculty of Architecture and Planning, Thammasat University.

Design, Business and Technology Management. (2018). *DBTM: imagine-collaborate-create. Faculty of Architecture and Planning, Thammasat University.* Retrieved March 22, 2021, from https://www.tds.tu.ac.th/wp-content/uploads/DBTM_Curriculum-Outline.pdf.

Gesawahong, S., & Wongwatcharapaiboon, J. (2020). Platform design to promote the sustainable material-sharing in circular economy in Bangkok, Thailand. *Built Environment Research Associates Conference 2020: BERAC 2020* (pp. 625-633). Faculty of Architecture and Planning, Thammasat University.

Gullickson, A. M., King, J. A., LaVelle, J. M., & Clinton, J. M. (2019). The current state of evaluator education: A situation analysis and call to action. *Evaluation and Program Planning, 75*, 20-30. https://doi.org/10.1016/j.evalprogplan.2019.02.012

Hakan, K., & Seval, F. (2011). CIPP evaluation model scale: Development, reliability and validity. *Procedia - Social and Behavioral Sciences, 15*, 592-599. https://doi.org/10.1016/j.sbspro.2011.03.146

Hasan, A., Yasin, S. N. T. M., & Yunus, M. F. M. (2015). A Conceptual framework for mechatronics curriculum using stufflebeam CIPP evaluation model. *Procedia - Social and Behavioral Sciences, 195*, 844-849. https://doi.org/10.1016/j.sbspro.2015.06.324

Imyen, K., Wongwatcharapaiboon, J., Thienthaworn, A., Irvine, K., & Sim, V. (2021). Storytelling strategy for value-added approaches to enhance self-Service water kiosk demand in urban Thailand. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 980-989). Faculty of Architecture and Planning, Thammasat University.

Kamolnate, S., Thienthaworn, A., Boonyanun, A., & Lam, B. (2021). Service design approach to increase customer experience in car wrapping service. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 892-900). Faculty of Architecture and Planning, Thammasat University.

King, J. A., & Clinton, J. (2022). Introduction to the special issue on evaluator education. *Evaluation and Program Planning, 91*, 102016. https://doi.org/10.1016/j.evalprogplan.2021.102016

Kunkhett, S., Jamieson, I, A., Wongwatcharapaiboon, J., & Mongkol, K., (2021). A Study of sustainability for the wedding industry in Bangkok, Thailand. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 990-997). Faculty of Architecture and Planning, Thammasat University.

LaVelle, J. M., & Davies, R. (2021). Seeking consensus: Defining foundational concepts for a graduate level introductory program evaluation course. *Evaluation and Program Planning, 88*, 101951. https://doi.org/10.1016/j.evalprogplan.2021.101951

Maneerattanakulchai, J., & Wongwatcharapaiboon, J. (2019). Gamification for promoting well-being retirement for "the first jobber in Bangkok.". *Built Environment Research Associates Conference 2019: BERAC 2019* (pp. 196-203). Faculty of Architecture and Planning, Thammasat University.

Mekdusadeerom, N., Boonyanan, A., Thienthaworn, A., & Mongkol, K. (2021). A Study of Thai consumer behavior who have purchased perfume on digital platform. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 1029-1038). Faculty of Architecture and Planning, Thammasat University.

Mohebbi, N., Akhlaghi, F., Yarmohammadian, M. H., & Khoshgam, M. (2011). Application of CIPP model for evaluating the medical records education course at master of science level at Iranian medical sciences universities. *Procedia - Social and Behavioral Sciences, 15*, 3286-3290. https://doi.org/10.1016/j.sbspro.2011.04.287

Neyazi, N., Arab, P. M., Farzianpour, F., & Mahmoudi Majdabadi, M. (2016). Evaluation of selected faculties at Tehran University of Medical Sciences using CIPP model in students and graduates point of view. *Evaluation and Program Planning, 59*, 88-93. https://doi.org/10.1016/j.evalprogplan.2016.06.013

Nimcharoenchaikul, S., & Wongwatcharapaiboon, J., (2020). Design digital platform for green construction material selection. *Built Environment Research Associates Conference 2020: BERAC 2020* (pp. 618-624). Faculty of Architecture and Planning, Thammasat University.

Pattamaprapanon, W., Thienthaworn, A., Boonyanan, A., Lam, B., & Chotiratanapinun, T.(2021). A Study of service design to create car care services for elderly drivers in Thailand. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 1017-1028). Faculty of Architecture and Planning, Thammasat University.

Poth, C. N., Searle, M., Aquilina, A. M., Ge, J., & Elder, A. (2020). Assessing competency-based evaluation course impacts: A mixed methods case study. *Evaluation and Program Planning, 79*, 101789. https://doi.org/10.1016/j.evalprogplan.2020.101789

Roongrattanakul, M., & Thienthaworn, A. (2021). The Design guideline to enhance the experience for K-Pop fan club members in Thailand by proposing the new concept of a one-stop purchasing service in digital platform. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 927-940). Faculty of Architecture and Planning, Thammasat University.

Rungruangkollakit, P., Booyanan, A., Theinthaworn, A,. & Mongkol, K. (2021). A Study of customer experience for spa at home service to attract Thai office workers. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 961-968). Faculty of Architecture and Planning, Thammasat University.

Sinluksanatip, A., Grøn, N., & Lam, B. (2020). A Study of Thai fine-dining experience to create a design guideline for Thai restaurant in United States. *Built Environment Research Associates Conference 2020: BERAC 2020* (pp. 640-646). Faculty of Architecture and Planning, Thammasat University.

Sisang, K., Jamieson, I. A., Wongwatcharapaiboon, J. & Chulerk, R. (2020). SATI (Smarter Agriculture Thai Initiative): A smarter organic farming model for Thai farmers. *Built Environment Research Associates Conference 2020: BERAC 2020* (pp. 17-26). Faculty of Architecture and Planning, Thammasat University.

Soonthonthai, A., Thienthaworn, A., Boonyanan, A. & Lam, B. (2021). The Study of behavioral design to raise brand awareness towards filters on social media platform as a new marketing tool. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 941-946). Faculty of Architecture and Planning, Thammasat University.

Srisa-ard, S., Promsit, S., Thienthaworn, A., & Mongkol, K. (2021). Resort & recreation positioning strategy of free individual traveler (F.I.T.) for the hotel business in Kraeng Krachan, Phetchaburi, Thailand. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 947-960). Faculty of Architecture and Planning, Thammasat University.

Sutthichaisorakul, T., Promsit, S., Boonyanan, A., & Mongkol, K. (2021). To Study marketing communication strategy of automotive parts business for generation z. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 877-891). Faculty of Architecture and Planning, Thammasat University.

Suwana-adth, N., Thienthaworn, A. & Boonyanan, A. (2021). Raise awareness of balm product (Boon Tarik) by use of gamification, which was used to create awareness to customers and calculate the results through data analysis. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 921-926). Faculty of Architecture and Planning, Thammasat University.

Teang, L., Wongwatcharapaiboon, J., Irvine, K., Jamieson, I., & Rinchumphu, D. (2021). Modelling the impact of water sensitive urban design on pluvial flood management in a tropical climate. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 350-359). Faculty of Architecture and Planning, Thammasat University.

Thanyamahasunthon, J., & Wongwatcharapaiboon, J. (2021). The Strategic analysis to enhance secondhand luxury customers' purchasing experience on the online platforms. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 911-920). Faculty of Architecture and Planning, Thammasat University.

Tramod, P., Thienthaworn, A., Grøn, N., & Lam, B. (2020). A Study of enhancing customer experience and differentiation in Thai hostel business through service design. *Built Environment Research Associates Conference 2020: BERAC2020* (pp. 1017-1028). Faculty of Architecture and Planning, Thammasat University.

Tuna, H., & Başdal, M. (2021). Curriculum evaluation of tourism undergraduate programs in Turkey: A CIPP model-based framework. *Journal of Hospitality, Leisure, Sport & Tourism Education, 29*, 100324. https://doi.org/10.1016/j.jhlste.2021.100324

Western Governors University. (May, 30 2020). *Five educational learning theories*. Retrieved March 22, 2021, from https://www.wgu.edu/blog/five-educational-learning-theories2005.html#close

Wongpittayanukul, S., & Jamieson, I. A. (2021). An investigation into how to create smarter multi-generational homes that aid wellbeing. *Built Environment Research Associates Conference 2021: BERAC 2021* (pp. 1008-1017). Faculty of Architecture and Planning, Thammasat University.

Zainal, Z. (2007). Case study as a research method. *Jurnal Kemanusiaan, 5*(1), 1-6.