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Research Article

Collective Knowledge and Skills of Planning and Executing Future-proof Curriculum Design of Outcomes-based Graduate Education

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ABSTRACT

The competitiveness of the workforce and the country's productivity in the future depend mainly on the quality of education. The strategic mindset of education leaders and planners, policy-makers, administrators, researchers, teachers, students, and engagement of external stakeholders are some of the critical foundations of effective human capital development. Future-proof professionals are products of the quality of minds of the crafters and implementors of the graduate education curriculum. Therefore, education planners must be equipped with the necessary knowledge and skills of curriculum planning. The University of Southeastern Philippines, College of Development Management (USeP-CDM), explores the opportunity to create a global community of professionals by developing an Outcomes-based Graduate Education (OBGE). Thus, this study aimed to determine the collective knowledge and skills of planning and executing curriculum design of graduate education of the college. This study employed a qualitative method of research using action research. Action research is an appropriate design of the study because it is anchored on the principles of participation, empowerment and critical reflection in curriculum planning. Data were collected from the in-house faculty workshops and meetings, external stakeholders' consultations, and research conferences. Action learning and reflective practice were used to validate the predetermined themes of the collective knowledge and skills in the planning and executing curriculum design and development. The study revealed seven collective knowledge and skills demonstrated in planning and implementing the curriculum design and development. These knowledge and skills include Innovation, Design Thinking, Futures Literacy, Collaborative Foresight, Systems Thinking, Creative Thinking, and Reflective Practice. Finally, the study's findings showed that a newer sensibility of

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planning and execution of future-proof graduate education curriculum emanates from cultivating the knowledge creation process of the education planners, faculty, students, and administrators.

Keywords: *Futures Literacy, Innovation, Outcomes-based Education, Curriculum Design*

Background

The competitiveness of the workforce and the country's productivity in the future depend mainly on the quality of education. The new globalization and digitalization have tremendous impacts on the design and models of higher education. The COVID-19 crisis has accelerated the efforts of the universities and colleges into digital transformation. The study of Grajek (2020) before the global pandemic revealed that 13% of the colleges and universities were already engaged in digital transformation (Dx), 32% have started developing Dx strategy, and another 38% of the higher educational institutions (HEIs) are exploring Dx, and only 17% of the institutions indicated that they have not invested in Dx. However, during the COVID-19 crisis, Barbero (2020) of the World Economic Forum (WEF), observed the rapid evolution of the digital world and the drastic shift in education market demands – the “ed-tech phenomenon” of the education sector. The crisis has redirected and amplified the priorities and actions of universities towards the adoption of educational technologies (edtech) for operational continuity and long-term institutional direction.

Universities and colleges must be responsive and adaptable to the rapid change of the higher education environment. The competencies of the graduates as the future human capital are also determined by the quality and robustness of the curriculum. This means that future-proof professionals begin from a strategic foresight of the competencies and skills needed by the industry in the future. On the other hand, the quality of higher education leaders, administrators, and curriculum planners plays a vital role in designing and developing a preferred curriculum in the future.

The study of Jacobsen, M. et. al. (2018) magnifies the “global trend toward improving programs and student experiences in higher education through curriculum review and mapping of degree programs”. The authors argued that the driver for continual program improvement came from actions and recommendations that arose from an institutionally mandated, year-long, faculty-led curriculum review of professional graduate programs in education. Furthermore, the findings revealed that program improvement, such as: developing a visual conceptualization of the program; improved connections between the courses; articulation of coherence in goals and expectations for students and instructors; an increased focus on action research; increased ethics support and scaffolding for students; and the fostering of communities of practice are essential innovation initiatives in graduate education.

In the Philippines, the government allocated three billion pesos under the Bayanihan 2 Law for the digital transformation of state universities and colleges (SUCs) and the development of intelligent campuses in response to the challenges of the COVID-19 crisis. This massive amount of investment was on top of the smart campus initiatives of the state universities and colleges, which benefited the 1,729 of the total 2,396 HEIs in the Philippines before the global health pandemic. Meanwhile, private HEIs were encouraged to find funding to upgrade their infrastructure and capacity as part of their learning continuity plan (Chao, 2021).

In the midst of the COVID19 crisis, HEIs have introduced different innovation initiatives as part of the institutional learning continuity plan. For example, in the study of Asio and Bayucca (2021) found out that the schools were not yet ready to implement a distance learning scheme. The study also highlighted the perceived challenges of internet connectivity as

the primary concern. Some of the other challenges involve preparation, competencies, funding, and devices for distance learning.

There were already several initiatives by the Philippine SUCs in the context of internationalization. One of the sterling policies is the CHED Memorandum Order No. 15 series of 2017 (CMO 15), also called Policies, Standards, and Guidelines of Graduate Education. This policy mandated the HEIs to revise and align the competency standards of the graduate programs following the Philippine higher education typology.

The study of Paguio, D. et. al. (2021) revealed that under CMO 4 series 2020, the HEIs needs to review all curricular offerings and conduct necessary adjustments in the curricular structure or program of study. It is imperative in order to integrate flexible learning in the curriculum design and positioning of courses. The authors further stated that the recalibration and review of the curriculum is essential in the instructional design and delivery of programs focusing on the fundamental competencies, learning outcomes, program educational objectives in the context of flexible learning in the new normal. It follows on the alignment of teaching and learning materials and resources and learning tasks.

The College of Development Management (CDM), as one of the colleges of the University of Southeastern Philippines (USEP), spearheaded the pilot project of curriculum revision on the following programs: Master of Science in Development Administration (MSDA), Master of Science in Public Administration (MPA), Master of Science in Development Communication (MSDC) and Doctor of Philosophy Program of Development Administration. However, the revision of the graduate program's curriculum was not only driven by CMO 15. It is also high time to revisit the competitiveness of the graduate programs as a response to the new globalization and the advancement of information and communication technologies of education.

The initiative of curriculum revision of the CDM's graduate programs was recognized as a welcome opportunity to innovate in the design and development of competencies that are at par with the graduates of the universities of the rest of the world. However, the college needs to

depart from conventional curriculum planning and development practice and shift into a newer curriculum design and execution sensibility.

Thus, this study intends to document the experiences and insights of the internal and external actors of the CDM in the process of curriculum design and development of its graduate programs.

Objectives of the Study

The shifting from a conventional model of planning and executing the curriculum design and development into a newer sensibility by adopting action learning and reflective practice is paramount in the context of the recent globalization and digital transformation of HEIs. This study aimed to uncover the collective knowledge and skills demonstrated in the planning and executing future-proof curriculum design and development of graduate programs of the CDM-USEP.

Review of Related Literature and Studies

SECI Model of Knowledge Creation of Curriculum Planning

There is a popular cliché in the knowledge-driven economy that data is the fuel of the economy. This means that economic growth can be sustained if policies made are based on evidence. An evidence-based approach is dependent on the access and availability of data. However, data alone is not sufficient to support the acceleration of the economy. It is about the transformation of data into meaningful knowledge. According to Drucker (1993), "knowledge is the only meaningful resource today." It is also the most valuable asset in the future. From the Western Philosophical traditions, knowledge is defined as a justified true belief. Plato and Descartes argued that it is regarded as "universal, scientific, logical, and rational." This type of knowledge is called "explicit knowledge." Moreover, Polanyi (1966) articulated that all knowledge is either tacit or rooted in tacit knowledge.

According to Nonaka (2014), there are two types of knowledge: tacit and explicit knowledge. He argued that tacit knowledge has a "subjective and experiential nature, and is not expressible with symbols and verbal

characterizations.” This type of knowledge is context-specific and characterized as cognitive and technical skills embedded in individuals. In contrast, explicit knowledge is “characterized as objective, rational which can be expressed clearly.” This type of knowledge tends to be “free from contexts, such as concepts, logic, theories, problem-solving methods, manuals, databases, or any other modes of expression that portray objective qualities”.

Curriculum planning and development is a typical demonstration of tacit and explicit knowledge. The process of curriculum design and development follows certain stages of knowledge creation. Nonaka (2014) described in his SECI Model the process of knowledge creation into four dimensions: Socialization (S), to empathize and observe reality as it is through experience; Externalization (E), which articulates and condenses the essence of awareness into a concept; Combination (C), which relates the concepts, systemizes, and simulates in the form of technology, products software, services, and experiences; and Internalization (I), which embodies the knowledge by actually using the resulting products and services. The optimal utilization of tacit and explicit knowledge following the SECI model provides curriculum planners and academic administrators autonomy to innovate curriculum design and development.

The application of SECI model planning is exemplified in the study of Cheng, E. C. K. (2019) which shows that “externalization and combination processes support the planning, implementation and evaluation processes, and collaborative culture, is identified as the critical success factor to facilitate the externalization and combination processes for creating knowledge for implementing the strategic plan”. The author argued that “nurturing a culture of systems thinking in the schools are critical to managing effective strategic planning processes”. His paper also cited the findings of Glasby & Holden, 2003 and Hong, 2012 which states that “the identification of collaborative culture for institutionalizing the SECI mechanism in schools is a response to the international debate of the culture and context dependent issues on using Nonaka’s SECI model for knowledge creation”.

The Future-proof Professionals

Collins dictionary defines future-proof as the act to design or change so that it will continue to be practical or successful in the future if the situation changes. This means that future-proof professionals continually upgrade their knowledge and skills to be responsive to the demands of work in the future driven by technological advancement.

In the study of Robinson (2021), a survey was conducted in the United States on the prospect of job losses, and the results revealed that the majority (53%) of survey respondents reported that their employees were “very” or “fairly” concerned about their short-term job security, while 25% of survey respondents said their employees were “not at all” concerned. This implies that despite the advancements in technology, automation cannot replace many essentially human skills. The study further divulged the skills that will set humans apart from robots and advanced technology included creative thinking, communication, complex problem-solving, IT/network information security, and decision-making. These findings were corroborated by the Future Jobs Report of the World Economic Forum (WEF), which enumerated the soft skills needed in the future, namely: complex problem solving, creativity, critical thinking, people management, coordinating with others, emotional intelligence, judgment, decision-making, service orientation, negotiation, and cognitive flexibility (Gray, 2016). The same study of Robinson (2021) affirmed that the popular methods of improving employee skills are internal training and re-training programs (48%) and online courses (44%). However, many companies are not yet deeply invested in skills training.

Preparing future-proof professionals and ensuring that they are equipped with the essential skills of the future is the moral mandate of the university. It implies the quality of the curriculum that is expected to provide the learning outcomes that can meet the needed skills in the future.

Outcomes-based Education

Universities and colleges now adopt outcomes-based education (OBE) in curriculum design and development. It is “a learner-

centered approach to education that focuses on what a student should be able to do in the real world upon completion of the program” (Rous- sel, 2014). It is used as a guiding framework in curriculum planning and development. The curriculum design must determine the out- comes, including authentic assessments, rele- vant learning activities, and selecting appropri- ate content.

Outcome-based education, according to Harden (2015), provides a “clear specification of the end product of training and the associ- ated learning outcomes that are essential for an effective curriculum planning.” He also argued that curriculum development in medical educa- tion, for example, traditionally adopted the planning approach. This approach has failed to meet the needs of the population and systems of healthcare, an evidence that it is no longer appropriate for the training of a 21st-century doctor.

Innovation in Curriculum Planning and Develop- ment

The future of work and the fundamental skills needed in the labor market suggest that universities and colleges must be sensitive to the signals of change of the higher education in- dustry. Relevant curriculum in the future is a result of continuous innovation. In the study of Findıkoğlu and İlhan (2016), it presented that curriculum must be redesigned in a manner that will cultivate and develop critical and cre- ative thinkers who can contribute to the knowledge society. The authors further argued that knowledge building, problem-solving and innovation, skilled communication, collabora- tion, self-regulation, and technology for learn- ing are the learning outcomes of the 21st cen- tury. This means that students of the future are knowledge producers rather than consumers of knowledge.

Models and processes of curriculum design are diverse. Take for example the study of Ba- ert and Stevens (2019) that developed “design propositions leading to the process steps that guide professionals towards developing future- proof sustainable curriculum. The process of implementation integrated insights and field- tested propositions in the curriculum design,

which bridged practice and academia through the development of actionable knowledge.

Shaping the future of graduate education is a function of the capabilities of the academic leaders in the knowledge creation process. Likewise, the pursuit of producing future-proof professionals is molded by innovation in the process of curriculum planning. Educational leaders and educators are stewards of the fu- ture of professionals. Thus, these leaders and educators are architects of future-proof curric- ulum design and development. The capabilities of the academic leaders influence the graduate outcomes of the program. Therefore, the uni- versity’s intellectual vanguards must be equipped with collective knowledge and skills of designing and developing future-oriented curriculum.

Methodology

This study employed a qualitative method of research using action research. Action re- search is an appropriate design of the study, hence, it is anchored on “community-based study, co-operative inquiry, action science and action learning. It is an approach that is com- monly used in improving the conditions and practices of curriculum planning (Lingard et al., 2008; Whitehead et al., 2005). Moreover, the purpose of this research is to bring about “change in specific contexts (Parkin, 2009). Through observations and communications with the collaborating partners and members of the faculty of the college conducted informal evaluations and judgements about the correc- tive actions being done as a result of careful planning, observation and listening and critical reflection. Meyer (2000) maintains that action research’s strength lies in its focus on generat- ing solutions to practical problems and its abil- ity to empower practitioners, by getting them to engage with research and the subsequent de- velopment or implementation activities. Data was collected through scoping of documenta- tion reports, transcription of the in-house col- lege workshops, virtual conferences, lecture se- ries, committee meetings, and college research conferences. Virtual external stakeholders’ consultations were conducted and were partic- ipated by Undersecretaries, Regional Directors,

and agency heads of the Philippine Institute of Development Studies, Industry partners, Graduate Students, Non-government Organization, and professors from other universities. Action learning and reflecting on the insights raised were used to make sense of the data and were later validated by presenting the processed organizing themes of knowledge and skills as applied in the curriculum design and development.

Results and Discussion

This section presents the findings of the study. This is where the SECI model of the knowledge creation process from socialization, externalization, combination, and internalization process of validating the collective knowledge and skills of planning and executing future-proof curriculum is actualized in arriving at the themes.

Innovation in Planning Curriculum Design and Development.

The crux in the whole process of planning and executing curriculum design and development of CDM's graduate programs is the knowledge and skills of innovation. Understanding the importance of innovation and application of the desired process and outcomes of the planning exercise affect the knowledge creation process of curriculum planning and development. The intellectual muscle of the college's moral intention to develop a future-proof graduate education curriculum started

from a collective perspective and insight of innovation. The curriculum committees, Program Heads, faculty, students, and Academic Administrators defined innovation as an improvement of the current academic Programs, which meant the value-adding activities in terms of achieving the graduate learning outcomes; an improvement in the process of curriculum planning and development; or an improvement of the college delivery of the graduate programs. With the definition of innovation, the quality of the minds and capabilities of the architects of the graduate education curriculum are necessary for the whole spectrum of curriculum revision. Based on the experiences and insights of the people commissioned to take the lead in the curriculum planning and development, they acknowledged that trainings, seminars, and brainstorming sessions on innovative thinking contributed tremendously to the improvement of their capabilities in designing a plan. This process intended to depart from honoring the accustomed historical practices of curriculum planning and development. Findings revealed that knowledge and skills on innovation drive a future-proof graduate education curriculum. Curriculum planners are innovative if equipped with the fundamental knowledge and skills of design thinking, collaborative foresight, futures literacy, systems thinking, creative thinking, and reflective practice as shown in Figure 1, the Knowledge and Skills of Planning and Execution of Curriculum Design.



Figure 1. Knowledge and Skills of Planning and Execution of Curriculum Design and Development

Design Thinking

A good education planner must be a good designer. This means that a practical planner must be equipped with knowledge of skills in designing. Design thinking is defined as a “non-linear, iterative process that teams use to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test” (Siang, 2009). In the context of the graduate education curriculum design and development of the college, the business model canvas of each graduate program was constructed. The business model template was used to identify the needs/opportunities of the potential professional students in terms of the graduate learning outcomes or competencies of the graduates. These needs/opportunities of the MPA, MSDC, MSDA and Doctorate Programs were used to match the value proposition of the college. The output was a minimum value graduate program (MVGP). The constructed business model of each graduate program was presented to internal and external stakeholders for consultation and validation, in particular, the core and distinct competencies of the graduates. The processes being adopted by the Program Heads, Curriculum Committees, and Academic Administrators of the college were manifestations of applying the knowledge and skills of design thinking in curriculum design and development.

Systems Thinking

Planning is seeing the bigger picture and understanding the interrelationships of the different subsystems. This means that a practical education planner must be equipped with systems thinking. It is defined as a “holistic approach to analysis that focuses on the way that a system's constituent parts interrelate and how systems work overtime and within the context of larger systems” (Lutkevich, 2020). Understanding the essence of systems thinking in curriculum planning and development is essential in unfolding the interaction of the curriculum, faculty, students, administration, edtech, learning commons, research and development, extension services, and other subsystems of higher education in a more extensive system. Based on the experience and insights of the Program Heads, Curriculum Committees

and Academic Administrators it showed that during the crafting of the plan for curriculum revision of the graduate programs of the college, the internal stakeholders represented by academic, administration, and research and development were already engaged in the knowledge wealth creation process of curriculum design and development. External stakeholders' consultation from government, industry, students, and non-governmental organizations were also involved in vital activities of the curriculum revision to ensure that insights into the higher education system were considered. This implies that the knowledge and skills of systems thinking and its application in planning and executing curriculum design and development are crucial in the graduate program's success. “Systems thinking is a mindset to think, communicate and learn about systems to make the full patterns clearer, improve and share the understanding of problems and see how to face them effectively” (Oliveri, 2020).

Collaborative Foresight

Curriculum planners and academic administrators must be equipped with knowledge and skills of collaborative foresight. The capability of the HEIs to foresee the future significantly affects the design of future-proof graduate programs at present. Collaborative foresight is defined as improving the “ideation, problem definition, and consensus in long-horizon strategies.” “The use of collaborative foresight contributes in generating a variety of perspectives in scenario creation, resulting in improved strategic options” (Jones, Weigand, Flanagan, & Daye, 2014). This corroborated with Oliveri (2020) which argues that foresight as a discipline broadens exploration of alternative futures and deepens the investigation of the worldviews that underlie the possible, plausible, probable, and preferred futures. Documentation reports from the series of workshops and conferences of the curriculum revision revealed that the Commissioned Committees, Program Heads and Academic Administrators employed tools on collaborative foresight such as scenario building and futures triangle in forecasting the competencies of the graduates of MSDA, MSDC, MPA, and Doctorate Programs. The use of scenario building enabled

the college to identify the significant drivers of higher education in the Philippines, while the futures triangle was used to map graduate education's historical, present, and future images. The appreciation and understanding of the college Program Heads, Curriculum Committees, and Academic Administrators were proofs of the application of collaborative foresight in the college's graduate education curriculum revision initiatives.

Futures Literacy

Cultivating the critical knowledge of the future depends mainly on the futures literacy of the people in the organization. Olveri (2020) defined "futures literacy" as a skill that allows people to imagine better and make sense of the future. It is important because images of the future drive our expectations, disappointments, and willingness to invest or change. Curriculum planners and administrators need to be equipped with the knowledge and skills of future thinking by cultivating the futures literacy of college personnel. This means creating a micro-community of knowledge management on futures thinking is imperative if the college wants to develop narratives and construct artifacts of the futures of graduate education. Based on the results of the study, it was revealed that the committees and academic administrators have attended training on futures thinking and demonstrated its application in curriculum design and development. The action learning on futures thinking suggested that the college exhibited interest and value the knowledge of futures thinking as a critical component of cultivating the futures literacy of the architects of the future-proof graduate education.

Creative Thinking

In the curriculum design and development of graduate programs, creativity is vital in shifting from the orthodox model of graduate education into a future-ready and antifragile professionals. Creative thinking is an essential skill in the era of convergence of cyber-physical systems, artificial engineering, the internet of things, and the internet of services or the

so-called 'merger of machines and humans.' For higher education to be resilient and adaptable, the creativity of the curriculum planners and academic administrators is imperative if the university wants to be relevant in the future. The CHED released CMO 15 and mandated HEIs to adhere to the policies, standards, and guidelines of graduate education and providing a broader latitude to exercise creativity in the course of the curriculum revision. The college's concerted curriculum design and development efforts resulted from a multiplicity of perspectives by integrating research, workshops, and external stakeholders' consultations from different fields of interest. It also revealed that creativity only flourishes if the committee and academic administrators are given the autonomy to experiment and design an innovative graduate education curriculum.

Reflective Practice

Donald Schon (1984) defined reflection as "the ability of professionals to 'think what they are doing while doing it.'" The planning and development of the graduate education curriculum was a product of the reflective practice of the Committees, Program Heads, and Academic Administrators. It was revealed in the documentation reports that curriculum design and development of the college's graduate programs were rooted in the reflection of the lessons learned in the previous initiatives of curriculum revision. Participants realized that there were efforts of improving the graduate programs in the past that did not work anymore, and there were also practices that needed to be continued. Further, they also found in the process of curriculum revision that there were things that they have learned during the workshop and consultation that needed more consideration. Schon's reflection-in-action and reflection-on-action described these capabilities of reflective practice as demonstrated by the commissioned faculty. It was notable from their experience that "knowing-in-action" was translated to how knowledge and skills of tackling problems and skillfully executing solutions were applied during the curriculum design and development.

Conclusion

The following conclusions are drawn based on the findings of the study. Future-proof professionals are produced from a quality graduate education curriculum. A future-ready curriculum is a product of the collective knowledge and skills of the architects of graduate education. Therefore, the future of the workforce is determined by the future-proof curriculum design and development of graduate programs.

The fundamental skills of future-proof curriculum design and development of graduate programs of the CDM are the result of the knowledge wealth creation process of innovation, systems thinking, design thinking, collaborative foresight, futures literacy, creative thinking, and reflective practice. Therefore, the quality of the process and outcomes of curriculum design and development is a function of collective knowledge and skills in curriculum planning and execution.

Implications

The following implications are drawn consequently based on the conclusions of the study. Curriculum planners, academic leaders, and administrators must be equipped with newer curriculum design and development sensibilities. Innovation in the process of curriculum planning and development of graduate education is the consequence of exploration and experimentation. There are no ready-made models for producing future-proof professionals.

Cultivating the culture of innovation in the university is vital in any curriculum planning and development initiatives. Academic leaders, education planners, administrators, and professors must be equipped with the fundamental knowledge and skills of systems thinking, design thinking, collaborative foresight, futures literacy, creative thinking, and reflective practice in the curriculum design and development within the context of the intellectual muscle of the university.

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