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Research engagement and knowledge networks of the School of Management and Information Technologyof the De La Salle–College of St. Benilde (Philippines)

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Abstract: *Information technology (IT) shapes public opinion because it shapes the manner of interactions, reactions, and actions to information found online by any user. But the IT-scape is shaped by graduates of information technology who are not only the final arbiters of information that shaped them and they will be able to shape. The future shapers of IT and public opinion are at the mercy of IT faculty who either has enough or inadequate knowledge of IT and research. This study looked into the research engagement and knowledge networks of De La Salle-College of St. Benilde (DLS-CSB) School of Management and Information Technology (SMIT) in the Philippines. Through the lens of Connectivism LearningTheory, the study analyzed the data originating from a five-part online survey distributed through Google forms between December 2 and 15, 2022 to a total of 18 volunteer respondents, accounting for the majority of the faculty in the SMIT. The data revealed that knowledge of research was greatly oriented towards traditional quantitative and qualitative approaches, methods, and analytical techniques. While reporting knowledge in quantitative approaches and methods, data revealed weakness in particular areas of the methodology. Greater weakness was found in qualitative methodology. The reported highest level of competence is research was found in writing the background of the study. The study also found attrition from knowing areas of research up to leading a team of researchers.*

Key Words*: Knowledge Network, Research Engagement, Connectivism Learning Theory, De La Salle - College of St. Benilde School of Management and Information Technology*

I. Introduction

A recent study from the Pew Research Center (Smith, Silver, Johnson, & Jiang, 2019) revealed that the public thinks that technology negatively and positively impacts the political environment. It was also revealed that the public believes that the Internet has made people better informed and yet more easily manipulable, as well. While seemingly showing a contradiction in that it is often believed that the more informed a person is, the less vulnerable to manipulation one becomes, such a public opinion must be listened to, especially by those in information technology management. This positive and negative impact on people was previously expressed by the Vatican in 1963 in Pope Paul VI's *Inter Mirifica*which declared that "these media, if properly utilized, can be of great service to mankind, since they greatly contribute to men's entertainment and instruction as well as to the spread and support of the Kingdom of God… (and against) the plan of the Creator… by their evil use" (para. 2). According to Data Empowerment (n.d.), big tech companies like Google and Facebook "create spheres of increasing economic, cultural, and political influence" (para. 6). And yet, while big tech companies wield so much power over public opinion, it is the educators shaping the people behind them that show the way to future public opinion influencers. A school like De La Salle-College of St. Benilde, home of a management

and information technology program, knows this power over public opinion that it possesses in the age of disinformation. Founded on research, technology becomes even more powerful in the age of the knowledge economy.

The mission-vision of the De La Salle-College of Saint Benilde (DLS-CSB) is about its commitment to building a just and humane society by being at the forefront of innovative education that is accessible to the poor and diversely-gifted learners. In the realization of its mission-vision, appropriate units to implement the college's research programs and initiatives were established. The Office of Institutional Effectiveness and Research (OIER) is in charge of creating and implementing policies, strategies, and programs related to faculty and institutional research. Aside from these, all schools within the college are mandated to pursue and boost their research productivity to adhere to the mandates of the CHED and maintain the college's autonomous status.

To improve research competitiveness in the ASEAN region vis-à-vis its top performers and assist in the economic development of their countries, higher education institutions must further advance their research productivity (Zaman, Khan, Ahmad, & Aamir, 2018). The DLS-CSB is a member of De La Salle Philippines, a network of Lasallians that was founded to facilitate collaboration in the Lasallian Mission. Hence, its research initiatives identify with the Lasallian core values that focus on faith, service, and communion to mission. Similarly, its areas of priority in terms of research are not just influenced by its identity as a Lasallian school, but also by other developments outside of the country, including globalization and the internationalization of education. To further advance better integral human development programs in Catholic tertiary educational institutions, research must be conducted by those involved in such programs. Hence, improving the research capacity of teachers in Catholic schools can further improve integral development programs through evidence-based, not just doctrine-based, decision-making.

Catholic schools, no matter how they are spread across the different countries or regions of the world, are founded to carry out the apostolic mission of the Church. In the Congregation of Catholic Education (2013, in Boateng, 2019), it is the mandate of the Catholic schools to advance the skills and knowledge of their students and learners through the acquisition of appropriate theoretical and practical tools for the betterment of themselves and of others. As Wodon (2021) espoused, even though the primary purpose of the establishment of Catholic schools is not economic, their contribution for societies' development is noteworthy. To achieve this and to foster academic excellence and performance, Catholic universities like other educational institutions are also directed to create an environment of good research productivity particularly to their faculty and eventually proving the school's capability to develop competent members of the society (Alcazaren&Robiños, 2022). Particularly in the Philippines, Catholic schools have become a key contributor in the country's professional sector by generating their own resources, assisting the government in the provision of employment, and advancing research studies (Aguas, 2019).

From the government's end, the Commission on Higher Education or CHED (2019) has taken steps to advance the pursuit of research in the Philippines through the Memorandum Order 15 last 2019 that requires students to publish in peer-reviewed journals before completing their advanced academic degrees. This meant that graduate students must seek to write a journal article ahead of their theses, dissertations, or capstone projects. Many graduate students who are in the teaching profession are expected to bring in their research writing competency in teaching their students research. Catholic schools are sure to benefit from this.

PhD degrees by research were also introduced by the CHED as one of three tracks that can be taken by a student. A PhD by research program in the University of the Philippines Mindanao (n.d.), satisfying CHED requirements, is defined in the following:

> … aims to produce graduates who have contributed to the body of knowledge in specific fields of study or to have provided innovative, theory-based, systematic, and practical solutions to the significant concerns of specific industries.Graduates will have advanced systematic knowledge and skills applied in a highly

> specialized or complex multidisciplinary field of professional work, research, and/or further study that require management expertise, innovation, and leadership. Graduates will demonstrate an in-depth understanding of theories and concepts necessary to advance learning and/or professional practice as well as to practice research skills providing a critical perspective of the real-world complex issues related to a specific field of study. (para. 1)

Graduate students who are able to do research through experience after earning their Master's degrees would benefit the most from a PhD by Research program especially if they are working full-time and cannot attend traditional course work face-to-face. Graduates of advanced degrees in research tracks can pave the way for the development of the same programs in their own institutions.

Research Productivity and Quality in Philippine Catholic Schools

To guarantee quality education, all schools must undergo an accreditation process. For less-performing schools, some government units take steps to assist them so that they not just able to undergo accreditation successfully but also participate in the application for competitive grants that the government provides (Bantugan, Anonuevo, &Maligaya, 2022). The Philippine Association of Accredited Schools, Colleges, and Universities (PAASCU, 2022) and the Philippine Association of Colleges and Universities Commission on Accreditation (PACUCOA, n.d.), major accrediting bodies in the Philippines, evaluate the research productivity of schools applying for accreditation. Similarly, the CHED based its vertical classification (autonomous, deregulated or regulated) of the HEIs on their commitment to excellence and institutional sustainability and enhancement. In the CHED Memorandum Order 46 series of 2012, pieces of evidence of research and creative works are among the parameters of determining institutional quality.

Research Engagement of Faculty in Higher Education

Research engagement in tertiary schools vary depending on a variety of factors. In Turkey, "positive experience with context-related research projects and dissemination of research results in various forms" are crucial in the sustainability of ongoing research projects and expansion into new ones, while lack of time and institutional support counter such growth (Sakarkaya&Bümen, 2022, p. 325). In rich Saudi Arabia, gaps between research productivity and support (Borg &Alshumaimeri, 2012) indicate that it takes more than just resources to arrive at research productivity. Across Europe, North America, the United Kingdom, Australasia, and Asia, commercialization and corporatization, led to research that mostly served private than public good (Parker, 2022). Thus, research productivity must be seen as a complex phenomenon bound to local needs and aspirations. In Catholic schools, it is also influenced by equally important priorities that compete with time, labor, and human competencies. Thus, it will take more than upskilling, environment (Nuqui& Cruz, 2012), administration (Dundar& Lewis, 1998; Uwizeye et al., 2021), work force (Kotrlik, Bartlett, Higgins, & Williams, 2002; Verdú, Davia, &Legazpe, 2016; Uwizeye et al., 2021) to achieve the desired research productivity. However, because among the factors associated with the professional growth of the faculty and the development of HEIs is research productivity, improving the products of research activities remain every institution's priority (Rosario et al., 2022).

Research Trends in Information Technology-Related Fields

The study of Gudanowska (2017) before the pandemic revealed that there was increasing attention being given to technology management, particularly in areas where innovation and product development play significant roles. Knowledge management, which includes the processes of knowledge creation and capture associated with research, has become an important research area, particularly in relation to "network analysis in the context of intellectual property and technology innovation, or the usage of technology management in the field of healthcare and quality management" (p.253). Technology management is integrated in a variety of research areas aa research approach and not as the focus of investigation. Nevertheless, it is a rapidly developing

interdisciplinary area of investigation. When the COVID-19 pandemic struck, it was noted that digital technologies were used in a variety of fields, particularly in education, healthcare, work, and daily life, following the trajectory of pre-pandemic times (Vargo Zhu, Benwell, & Yan, 2021). The impact of the pandemic on a variety of areas mentioned above shaped the conduct of research. If any, the pandemic seemed to have accelerated interest in information technology, particularly in the conduct of research. This means that there is reason to highlight the use of information technology in the research work of teachers, particularly those in the information technology discipline.

In the DLS-CSB, there are five priority areas for research. These are the academic discipline-based research, Lasallian studies, teaching and learning, inclusion, and innovation (DLS-CSB OIER, 2021). The academic discipline-based research includes various themes of research that the DLS-CSB's five degree-granting schools are focused on. Lasallian studies are about further deepening the knowledge on the Lasallian identity. As for the teaching and learning priority area, exploring the different instructional methodologies is in accordance with the college's educational philosophy and the Lasallian principles. DLS-CSB is also focused on the area of inclusion that intends to investigate and recognize the needs of diverse groups in the college such as but not limited to persons with disabilities (PWDs), learners with special education needs, learners on financial assistance, deaf and hard-of hearing learners, and indigenous peoples. Moreover, DLS-CSB has also included innovation in its research priority areas to allow for the construction of guides or toolkits for would-be entrepreneurs and innovators to be successful in their chosen business ventures. All things considered, the DLS-CSB research agenda moves within the college's goals to support its research structures, boost the associates' professional growth, and maintain competitive research programs (DLS-CSB OIER, 2021).

The DLS-CSB Research Agenda

The College Research Agenda (CRA) for AY 2021-2022 to AY 2025-2026 was ratified by the Academic Council of DLS-CSB in 2021. This DLS-CSB Office of Institutional Effectiveness and Research (2021) documented the agenda for the college's reference. The CRA included the five (5) research priority areas of the college, the research themes of the academic-discipline based research of each school, and the guiding principles that steer the research agenda. The top research priority area of the DLS-CSB is the academic discipline-based research. DLS-CSB is composed of five degree-granting schools and the general education program. The general education is involved with pursuing studies in teaching and learning, one of the research priority areas of the college. As for the five schools, each has its respective themes that served as the focus of their research projects in the next five years as covered by the CRA.

The School of Design and Arts (SDA) covered research clusters on Arts and Culture, Environment Studies, and New Media. The Arts and Culture cluster are involved in researches with themes on theatre and performance studies, arts and cultural education, arts and wellness, community-based arts projects and inclusion, artistic practices, creative industries and innovation, and leadership in the arts and social change. The cluster on Environment Studies work on Philippine creative economy, professional design practice future-proofing, materials resources development, emerging technology, and arts and culture heritage education. Subsequently, the New Media cluster included the themes new media as a discipline and practice, culture and language, emerging technologies, and art and design education.

The School of Deaf Education and Applied Studies (SDEAS) focuses on the research themes of deaf studies, deaf education, deaf formation, Filipino sign language (FSL), sign language interpreting, and deaf inclusion and accessibility. On the other hand, the School of Diplomacy and Governance (SDG) works on two primary research areas and these are foreign policy and international relations, and governance and development in the Lasallian context. In the School of HRIM (SHRIM), the identified research themes are culinary arts, travel and tourism management, hospitality management, innovations, teaching and learning, and quality management.

The School of Management and Information Technology (SMIT) has two research clusters, the management and the information technology cluster. SMIT's management cluster works on researches with themes on Catholic social thought in business education, human resource management and psychology, entrepreneurship, social entrepreneurship, and technopreneurship and innovation, sustainable development, business and management innovation; teaching and learning various business-related disciplines; risk management and business continuity; and real estate development and management. As for the information technology cluster, its themes are extensive to include artificial intelligence and machine learning, big data and data mining, human-computer interaction/gamification, e-inclusion and digital divide, competency assessment, risk management, internet of things, ICT infrastructure, teaching, learning and assessment (TLA), and business/industry applied research.

II. Study Framework

The study was guided by the Connectivism Learning Theory of Siemens (2004) that asserts that information is a network continually being acquired and updated. Knowledge, processed information made actionable (University of California Santa Cruz, 2022), results from learning through the use of information technologies (Fiore, 2018). According to Siemens (2012, in Fiore, 2018):

> In connectivism, knowledge is distributed across networks where connections and connectedness inform learning. Heavily grounded in technology, connectivism is a learning theory based on the acquisition of the knowledge focused on the future, not the past.

In this study, knowledge of research is situated in a network of methods and activities or practices linked to research. Furthermore, given that knowledge is information made actionable, a knowledge network of methods should reflect a network of actions using those methods. This study, thus, described the methodology knowledge networks that constitute network of research actions of the faculty members of DLS-CSB SMIT.

The study is important to DLS-CSB because research is one of the major pillars of an academic institution, and research productivity is one of the parameters of institutional quality. Moreover, as guiding principles of the CRA, DLS-CSB boosts the associates' research capabilities by recognizing their research contributions, and maintains research competitiveness by monitoring the development and progress of the research initiatives.

III. Methodology

This quantitative study conducted last November 2022involved the use of a six-part 58-item researcher-developed online survey through Google Forms (covering demographics, quantitative and qualitative research approaches, research methods, conceptual tools, and research skills) answered by majority (18 out of 23 or 78%) of the faculty of the DLS-CSB SMIT. The data were analyzed via descriptive statistics, involving analysis across data sets. The results were interpreted vis-a-vis the Connectivism Theory.

IV. Results

Overall, across quantitative and qualitative research approaches, data revealed that most of their faculty members attest to having learned research either from a class/training (the overwhelming majority) or self-study. However, their knowledge were weakest in the areas of data mining and meta-analysis that can both be used for qualitative and quantitative purposes. To improve in both approaches means they can potentially increase their productivity in both qualitative and quantitative studies. For now, it has the opposite impact.

Quantitative Research Approaches

Data show that the knowledge of the respondents is highest in polling, experimental study, multiple/case study, and testing – conventional quantitative approaches.These data mean that their quantitative research approach knowledge network is more attached to the more traditional and popular knowledge sources. Given the respondents' discipline, the findings are not surprising, since their field is largely influenced by positivism.

Table 1.
Self-reported knowledge of quantitative approaches

Quantitative Research Approach	Percentage (%)	Rank
Polling	72.2	1
Testing	61.1	4
Data Mining	55.6	5.33
Meta-Analysis	55.6	5.33
Experimental	66.7	2.5
Quasi-experimental	55.6	5.33
Multiple/Case Study	66.7	2.5

Qualitative Research Approaches

Influenced largely by positivism, polling, and multiple/case study, undertaken qualitatively, remain more well-known than other qualitative approaches. Polling and multiple/case study can be considered as their likely bridge between quantitative and qualitative approaches. Narrative Inquiry and Grounded Theory follow with more than 60 percent of the respondents being knowledgeable. Phenomenology and ethnography are still known to more than half of the respondents but are revealed to be not as popular as the first four. This means their research is not quite informed by philosophical discourse and ethnographic pursuits.

Table 2.
Self-reported knowledge of qualitative approaches

Qualitative Research Approach	School A	
	Percentage (%)	Rank
Polling	72.2	1
Meta-analysis	55.6	5.25
Data Mining	55.6	5.25
Narrative Inquiry	66.7	2.5
Phenomenology	55.6	5.25
Grounded Theory	61.1	4
Ethnography	55.6	5.25
Multiple/Case Study	66.7	2.5

Given the data in Tables 1 and 2, the respondents may be considered as more likely informed by experimental and testing networks coming from affiliated positivist fields. Meanwhile, they are also likely informed by non-positivist fields through the use of polling and multiple/case study approaches in their field. Polling and multiple/case study, being heavily used in the social sciences, may open doors for the respondents to other less-known approaches like ethnography and phenomenology.

Data Mining and Meta-Analysis, originally from the quantitative fields, have yet to take root in their disciplines. However, these approaches likely will be more known to respondents through default knowledge networks than one affiliated with ethnography and phenomenology. To develop a wider repertoire of research approaches in their field, it would be helpful to actively explore linkages with research fields that are not likely to intersect with theirs more easily. For example, netnography may easily be useful to the respondents' fields; hence, they should build associations with netnography practitioners. Similarly, virtual experiences may establish their common ground with phenomenology that is founded on the concept of "lived experiences". Figure 1 shows the respondents' current research approach knowledge network. The solid lines indicate greater connections while the broken lines mean weaker connections.

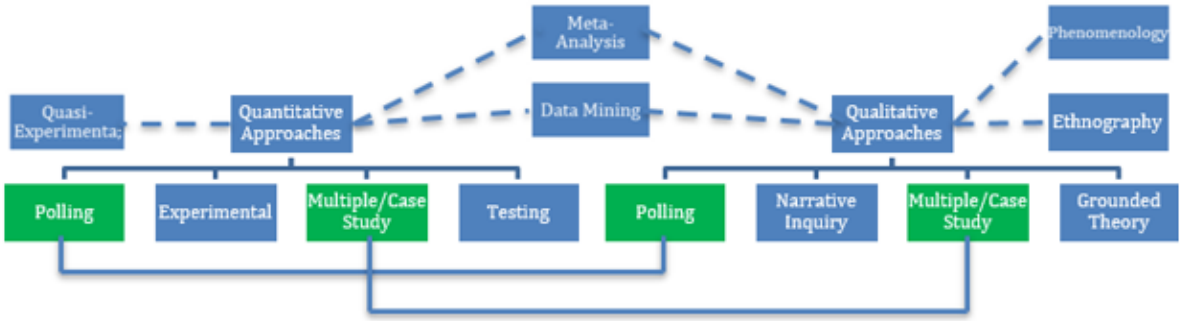

Figure 1. CSB respondents' research approach knowledge network

Figure 2. Research methods reported as known by the respondents

Information Gathering Methods

Data (in Figure 2) show that only four research methods acquired more than half the number of respondents (66.7-100%), namely survey, interview, and focus group discussion (FGD). The remaining 14 methods only had zero to 44.4 percent. This means only a minority know more than just the three most popular methods above and that the research methods toolkit of many is quite limited, not allowing for a variety of research construction possibilities. Similarly, it can be said that the research methods knowledge network of the respondents seems to be more homogeneous than heterogeneous, presenting a challenge towards greater diversification in their research network and updating of research method knowledge within their research community. Netnography and social listening (research on virtual communities), interactive and immersive activities (characteristic of online applications), and the other less-known methods that are now aided by computerization are still not quite known by many in their research community and must be actively pursued.

Analytical and Data Processing Techniques

The data in Figure 3 resonate with the data in Figure 1 in that the repertoire of analytical techniques is also quite limited. However, while Figure 2 shows that the interview and FGD are quite popular among the respondents, quantitative analytical techniques overshadow qualitative ones with descriptive and inferential statistics constituting the most dominant techniques. It should be noted, however, that while all respondents are knowledgeable of the survey, less than 100 percent know how to process data emerging from it (only 72% know descriptive statistics and 56% know inferential statistics). Hence, a few who are knowledgeable about the survey are not ready to process the data generated by it. Even fewer are the ones who know how to translate numbers to their appropriate graphic representations. Only SWOT analysis is a qualitative technique known by the majority owing to their link to business education where the respondents are associated. Most qualitative techniques have yet to be known by the majority as shown in Figure 3. This presents that the respondents must be assisted in acquiring more knowledge on qualitative data analysis.

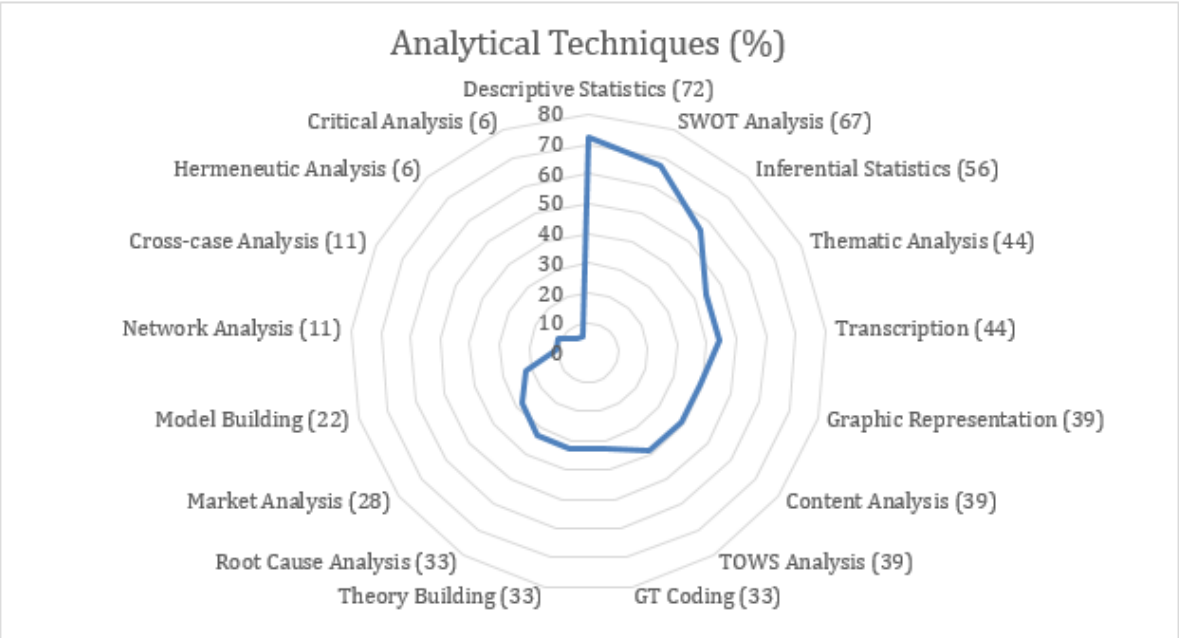

Figure 3. Data analytical techniques reported as known by the respondents

Research Writing Process

Proposal Writing: Introduction. Data from the 4-point Likert scale survey from the respondents revealed that they admit to being most knowledgeable in conducting the literature review using online and offline sources (3.3). Formulating the problem (objectives and research questions) was reported as their weakest (2.6). This being the case, their report that they know how to construct the study framework (2.8) more than the research questions and objectives is quite problematic in that the problem and study framework go hand-in-hand. There is no research without the research problem and knowledge of the framework without a problem is quite a misdirected pursuit. This issue has to be resolved even if the numbers suggest that they are quite knowledgeable in writing the background of the study.

Proposal Writing: Methodology. Regarding methodology, the respondents show that they are more knowledgeable (QK or quite knowledgeable) in the quantitative design than in the qualitative (NK or not so knowledgeable). That being the case, the score generated for Mixed Method design is rendered questionable in that conducting mixed method relies heavily on one's substantial knowledge of both quantitative and qualitative designs.

This data indicate that their knowledge of qualitative research must be improved to improve their knowledge of mixed-method research. Previous data, however, revealed that their knowledge of quantitative research is also questionable in that not all who admitted knowing quantitative research are also equally knowledgeable in quantitative data analytic techniques. Given this gap, knowledge inadequacies in quantitative research must also be addressed. Likewise, given the data on writing the background of the study vis-à-vis the methodology section, knowledge gaps in both areas must be addressed first before they can move towards improving research productivity.

Research Engagement

This study considers knowledge acquisition networks as knowledge-sharing networks. In an ideal knowledge network, a knowledge hub must be able to equally give and receive knowledge. Each activity in a network is an opportunity for giving and receiving knowledge; thus, knowledge must circulate in a knowledge network.

MoreKnowing, Less Action. Data reveal that up to 100 percent of respondents know something about (survey) research. Everyone knows about surveys but fewer respondents know about particular quantitative research approaches (maximum at 72.2% for polling). This means that the respondents' research knowledge network circulates knowledge about surveys/polling more than other quantitative methods/approaches. Figure 4 shows that there is general attrition from knowing to doing research (except for testing). Likewise, there is pervasive and continuous attrition in quantitative research engagement from conducting research to leading a team of researchers. Data mining and meta-analysis have the least types of engagement overall even if more than half of the respondents know them both. In contrast, quasi-experiment is the least known of the seven quantitative research approaches but has more types of engagements when compared to data mining and meta-analysis. Hence, this attrition has to be addressed at each level. However, before anything else, the gap between the knowledge about and the conduct of research must be solved.

The same research engagement attrition was found in qualitative research approaches (see Figure 5). Aside from meta-analysis(-synthesis) and data mining, Grounded Theory also had the least types of engagement among the respondents, despite being more known than phenomenology and ethnography. It should be noted that the gap between knowing and conducting qualitative research approaches is significantly larger than that in quantitative. This situation calls for the increased practice of qualitative research in CSB.

Table 3
Level of Knowledgeability on Domains and Dimensions of Research Proposal Writing

Domain	Dimension	Mean (School A)	Qualitative Interpretation
Background		2.9	QK
	Formulating objectives and research questions	2.6	QK
	Literature Review	3.3	VK
	Constructing the Study Framework	2.8	QK
Quantitative Methodology		2.7	QK
	Design	3.2	QK
	Mixed Method	2.7	QK
	Instrument Development	2.3	NK
	Descriptive Statistics	2.5	NK
	Inferential Statistics	2.5	NK
	Visual Representation	3.2	QK
	Use of Online Applications	2.3	NK
Qualitative Methodology		2.5	NK
	Design	2.6	QK
	Mixed Method	2.7	QK
	Instrument Development	2.4	NK
	Narrative Analysis	2.4	NK
	Use of Online Applications	2.3	NK

Legend:
3.26 - 4.00 - Very knowledgeable (VK)
2.51 - 3.25 - Quite knowledgeable (QK)
1.76 - 2.50 - Not so knowledgeable (NK)
1-00 - 1.75 - Without knowledge (WK)

V. Discussion

Quantitative and Qualitative Research Approaches and DLS-CSB

Data show that the respondents claimed to be more knowledgeable in four quantitative research approaches namely polling (72.2%), experimental study (66.7%), multiple/case study (66.7%), and testing (61.1%). However, less-known quantitative approaches with less than 60 percent self-reported knowledge are data mining, meta-analysis, and quasi-experimental. Correspondingly, polling (72.2%) and multiple/case study (66.7%) remain to be more prevalent, joined by narrative inquiry (66.7%) and grounded theory (61.1%). In

general, this finding is not unusual since many academic institutions conduct research based on observable facts and give less credence to non-observable entities such as feelings and values. And yet,"positive experience with context-related research projects and dissemination of research results in various forms" are crucial in sustaining ongoing research projects and expanding into new ones (Sakarkaya&Bümen, 2022, p. 325). This means that while the DLS-CSB should continue to strengthen these conventional quantitative approaches in the institution through continuous support and promotion among faculty researchers, this also implies that it needs to strengthen its research capabilities by asking for help from other institutions that can teach and guide them in terms of best practices for conducting various quantitative and qualitative research approaches. For example, DLS-CSB may conduct collaborative research with other institutions that have a strong foundation in these less-familiar approaches.

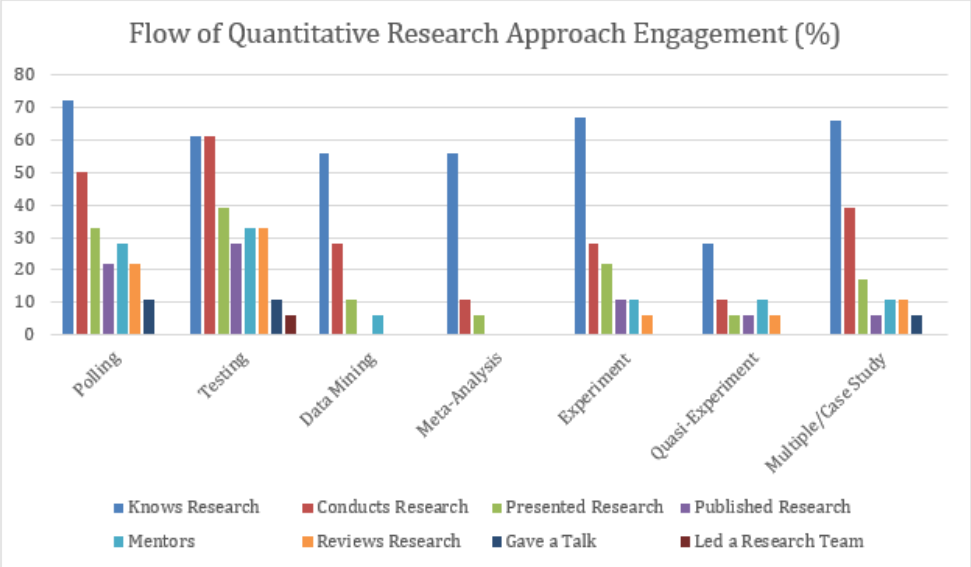

Figure 4. Research engagement flow per quantitative research approach

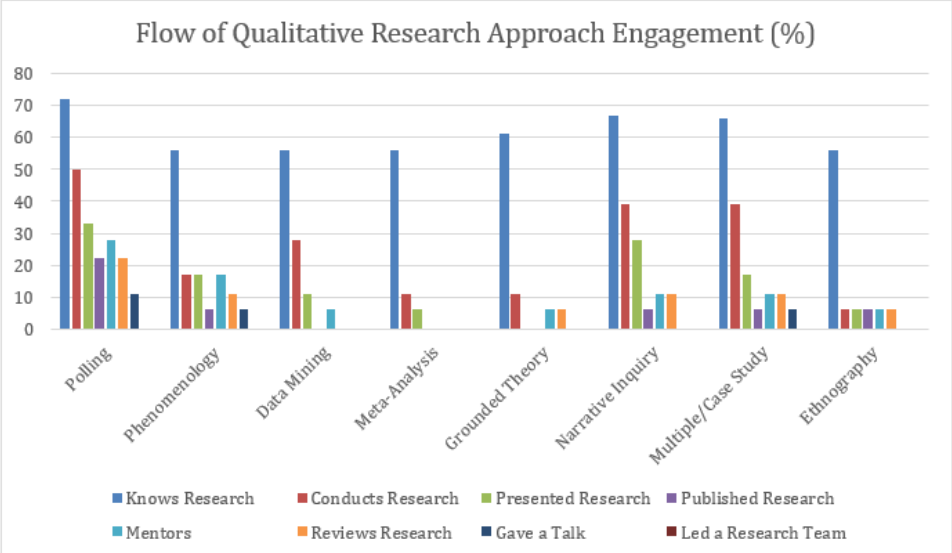

Figure 5. Research engagement flow per qualitative research approach

What makes the results intriguing is that Figure 4 and Figure 5 show a noticeable difference in research approach engagement in terms of knowing the research, conducting the research, and leading a research team. All research approaches, except quantitative testing, show a huge percentage of respondents who reported knowing the research approach but are not conducting it. Knowing a particular research approach is very different from conducting actual research using that approach. This only suggests that the faculty researchers in DLS-CSB are confident that they have good knowledge of how these approaches can be used but for some reason, not all have an opportunity to essentially translate such knowledge to conduct research. Moreover, most faculty research engagements are more inclined toward knowing than doing. Given this, upskilling, environment (Nuqui& Cruz, 2012), administration (Dundar& Lewis, 1998; Uwizeye et al., 2021), workforce (Kotrlik, Bartlett, Higgins, & Williams, 2002; Verdú, Davia, &Legazpe, 2016; Uwizeye et al., 2021) will be useless unless knowledge is understood as action-oriented.

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Dominant and Weak Research Methods and DLS-CSB

The top group refers to the dominant research methods that acquired more than half the number of respondents. These include three (3) namely survey (100%), interview (94%), and FGD (67%). Data imply that the DLS-CSB should continue to strengthen knowledge on the survey (100%), interview (94%), and FGD (67%) in the institution through continuous support and promotion among faculty researchers. On the other hand, the research methods where DLS-CSB is weak should be a concern for the DLS-CSB if it wants to produce diversity in the research outputs of their faculty researchers. As previously mentioned, technology management is integrated into a variety of research areas especially when the pandemic struck since it became more vital in a variety of fields, particularly in education, healthcare, work, and daily life (Vargo, Zhu, Benwell, & Yan, 2021).

The institution is well-known for its inclusivity and targeting five priority areas in research such as academic discipline-based research, Lasallian studies, teaching and learning, inclusion, and innovation. These areas could require more than just surveys, interviews, and FDGs to produce quality research outputs. If the institution's research goal is to boost the associates' professional growth and maintain competitive research programs, then, the data here should give them good feedback on what to improve and support in their research programs, particularly in information-gathering methods.

Dominant and Weak Data Analytical Techniquesand DLS-CSB

Knowledge of descriptive statistics (72%), SWOT analysis (67%), and inferential statistics (56%) should be further strengthened through continuous support and promotion among faculty and researchers. However, the less selected research analytical techniques are still not familiar to the majority of the DLS-CSB faculty researchers. Although 100 percent of the respondents claimed to be knowledgeable in the survey, only 72 percent know descriptive statistics and only 56% know inferential statistics. Thus, the DLS-CSB needs to reinforce these gaps in terms of support and programs to further improve these limitations in the quantitative and qualitative analytical techniques of their faculty researchers. Improving one's capability to process various types of data would greatly improve their confidence and intensify their engagement in more difficult research challenges.

Implications to the SMIT of CSB

The SMIT is just one of the seven schools of the DLS-CSB that follows the same research policies and guidelines provided by the institution. While the knowledge of research approaches is acceptable and can be improved, the cause for concern is the rest of the research approach engagements, particularly conducting research, publishing research, and leading a research team. The SMIT and the OIER-CFIR research policies and guidelines should understand that any research should be treated as a project. And each project will require

scope, time, and budget that are unique to each researcher. These results should open several possibilities that the SMIT could consider.

If their priority is to have faculty researchers that are already knowledgeable in various research approaches, they can always hire new faculty members who can do research using an approach that their current faculty researchers are not capable of. But that is not always the case. SMIT could already have faculty researchers that are willing to improve their skills in research engagement but are not properly given an appropriate scope, time, and budget. This could resonate back to the OIER-CFIR of the DLS-CSB to ensure that the funding policy is sustainable, with suitable time allocation to conduct and publish research at a reasonable period. SMIT is different from other disciplines in that many of its research areas may require a longer period to conduct, which will ultimately lead to higher financial assistance requirements. If one of its requirements (scope, time, or budget) is not satisfied, a good research concept (supported by research knowledge) will not be translated into actions (conduct of research), and the rest of the research engagements will not be achieved.

While it is good that the survey, interview, and FGD are the strong areas of the SMIT in terms of data gathering methods, the school should be aware that there are still plenty of unexplored methods that their faculty researchers should learn that can greatly benefit them in producing good quality papers. SMIT could use this result to recommend seminars, training, and another enrichment programs for their faculty researchers to further strengthen these weak areas of research methods.

Given its discipline in business and management, it is expected that more than half of the respondents are knowledgeable in SWOT analysis, which is qualitative in nature. But the analytical techniques that are most common to SMIT faculty researchers are descriptive statistics and inferential statistics, which are both quantitative. Data gathering methods and analytical techniques go hand-in-hand as knowledge in one affects the other. This is also evident in that many SMIT faculty researchers who know how to gather quantitative data do not know how to process the data using various analytical techniques. This could be a limiting factor for the SMIT faculty researchers in their data analysis to produce correct results with meaningful interpretations.

The knowledge networks that are needed by the DLS-CSB to bridge the gaps relevant to the SMIT are quasi-experimental, meta-analysis, data mining, phenomenology, and ethnography. These are the weakly connected research approaches that the SMIT needs to explore to further improve the research capability of the institution. Strongly connected research approaches such as polling and multiple/case study that exist both in the quantitative and qualitative domains should be used to bridge the gap among the identified weak research approaches with an assumption that the preliminary requirements have been satisfied. For example, Figure 1 shows the quasi-experimental approach, which is identified as weak, is closely related to the experimental approach, which is identified as strong and can be used to strengthen the former approach. Another example is the popular Delphi method that can be used in business management and IT yet Figure 2 shows that only 17% of SMIT faculty researchers know it. Their existing knowledge in data gathering such as interviews and textual analysis as well as data processing, such as thematic analysis, will be very useful to bridge the gap in improving their knowledge of the Delphi method. The SMIT faculty researchers should be encouraged with utmost support to conduct research and probably lead a research team using these unexplored approaches, methods, and analytical techniques to slowly build their skills through actions and not just knowledge.

The data suggest that the DLS-CSB's SMIT must further seek to expand its research knowledge and action network beyond its usual "within-reach" organizations in the larger disciplinal network that tends towards greater research homogenization. For innovation to take place, the network has to be interdisciplinary and methodologically diverse. Like many smaller institutions that look to larger and more prominent higher education institutions (HEIs) to act, DLS-CSB may find it difficult to diversify if it remains an avid follower of the "silo-based" model of operation that is more responsive to the needs of larger and more sophisticated HEIs

involved in the mass production of education. In the age of greater digitization, customization is key and, hence, it must customize its research networks according to its unique research agenda. While business education relies heavily on quantitative research, its highlighting Catholic social thought demands a qualitative mindset and approach. While human resource management and psychology demand competency in psychometrics, it does need input from the qualitative world of cultures. Entrepreneurship, social entrepreneurship, technopreneurship, and sustainable development all have roots in business but are also heavily informed by development in communities and of stakeholder voices which can be helped enormously by qualitative methods. Innovation, particularly business and management innovation, requires idea generation which can be better pursued through qualitative approaches and their corresponding methods. The volatile environment beyond the academe must encourage the SMIT to create the network that will allow it to adapt faster to new business environments and acquire the research competencies that might be more useful in the future than what is currently popular in its relevant fields.

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