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Research Article

Current Status of Computing Education in Central Luzon: Basis for Training and Program

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ABSTRACT

This study delves into the current status of computing education in Central Luzon, providing a foundational framework for the development of training programs within the Association of Computing Education Deans and Program Heads (ACED.PH). It addresses a critical research problem: the gap between existing institutional capacities and the quality standards outlined in CHED CMO 25 Series of 2015, particularly in areas of faculty research engagement, laboratory management, and organizational commitment. It investigates the challenges of membership and commitment in professional organizations and underscores the importance of effective leadership for organizational sustainability. ACED.PH, previously known as the Council of Deans in Information Technology Education (CDITE) Region 3, seeks to enhance the well-being of deans, program directors, teachers, and students within the Information Technology Education (ITE) field. The study employs a mixed-method approach, combining a descriptive research design and a survey questionnaire technique to comprehensively gather quantitative and qualitative data. Participants include administrators from accredited schools in Central Luzon offering ITE programs. The study utilizes a structured questionnaire with 72 items, evaluating ITE programs in terms of administration, faculty, curriculum, and laboratories. The study revealed that the schools offering ITE Programs in Central Luzon are above requirement as stipulated in the CMO 25 Series 2015. Furthermore, research capability and

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engagement of the faculty under the program need to be prioritized in the series of training sessions that the association will implement as it is below the requirement stipulated in the mentioned CMO. On the other hand, training on the upkeep of the laboratories and capability building among technical personnel in the school will be communicated to the school administration for them to be given ample skills and knowledge as computers are vital in the teaching-learning process of the ITE students. Lastly, more research collaboration among ITE Deans and Program Chairs is recommended to strengthen the research engagement of both the administration and faculty. The findings revealed the development of a short- and long-term action plan to ensure the sustainability of training and programs for computing education. The research aligns with the minimum standards set by the Commission on Higher Education CMO 25 Series of 2015 and Manual of Regulations for Private Higher Education (MORPHE). Understanding the current state of computing education in Central Luzon is vital for shaping the future of IT education and professional development within the region.

***Keywords**: Computing Education, Curriculum, Training and Development, Industry Collaboration*

Introduction

Professional organizations exist to advance a profession, protect the interests of those who practice it, and advance society (Grapin, Malone & Stoner, 2020). This is also true for the Association of Computing Education Deans and Program Heads (ACED.PH). Furthermore, professional organizations are formed for a variety of reasons and purposes by professionals with shared interests (Consoli, Andrés & Whaling, Kelly & Vanegas, Gina. (2017). Membership and commitment are both challenges for leaders of professional organizations. The case study of Breckon et al. (2019) supports the notion that the strongest benefit that members get from their respective professional organizations is the opportunity to network with their peers. According to the study's findings, good leadership is the key to member commitment, which is also a crucial element of member engagement and a driving force behind an organization's sustainability Cecilia & Lagaras, Maria Cecilia. (2019). The Association of Computing Education Deans and Program Heads is no different in this regard (ACED.PH).

The Council of Deans in Information Technology Education (CDITE) Region 3 was founded in 2010, and it is now known as ACED.PH. The Association seeks to enhance the welfare of the deans, program directors, teachers, and students by providing them with access to resources and connections that can help IT Education advance consistently. It is a non-stock, non-profit corporation that was established in accordance with Philippine law and is fully recognized by the Commission on Higher Education, Region III. 2019 (ACEDPH).

The initial step to aid the organization in meeting these objectives is to know the status of computing education in Central Luzon. A training needs assessment can identify performance gaps that lead to helpful recommendations of what to include in the final training solution (Mandato, 2022). Training needs assessment is essential for professional organizations. Brown (2020) described this as a continuous process that comprises data gathering to determine what training requirements are necessary to support organizational objectives. Organizations that execute training without first determining the need frequently face the danger of either doing too much training or not enough. Performing unnecessary training is even worse. Needs assessment is essential to the success of a training program as evident from various types of research conducted by Mazhisham, Panji & Khalid, Muhammad & Nik Nazli, Nik Nadian Nisa & Nazli, Nisa & Manap,

Ranita & Husna, Nur & Hussain, Mohamad (2018), Markaki, Adelais & Malhotra, Shreya & Billings, Rebecca & Theus, Lisa (2021), and Patil, Kotresh & Ulle, Ravishankar & Aparna, Dr & Varma, Aparna & Kumar, Dr & Murthy, Renuka (2018).

To provide relevant training and programs to the leaders in computer education, the study aims to determine the current state of computing education in Central Luzon. This information may be used as a basis for training and program creation. Based on the findings of this study, a short- and long-term action plan will be created to ensure the sustainability of the training and programs highlighted. Areas of data collection are based on the minimum standards set by the CHED CMO 25 Series of 2015 and MORPHIE.

Methods

In order to efficiently collect data, the researchers utilized a mixed-method approach that includes a descriptive research design and a survey questionnaire technique. The mixed-method approach is a research methodology that allows for the systematic integration of quantitative and qualitative data within the context of a single investigation or long-term program of investigation. In this study, such integration allowed for more comprehensive and synergistic data utilization than would be possible if the survey data results and interview responses data were collected and analyzed separately. The descriptive method was employed to describe the characteristics of a population or phenomenon under investigation. It does not address how/when/why the characteristics were developed. Instead, it addresses the "what" question. As Akhtar (2016) stated: "A descriptive approach in data collection in qualitative research gives the ability to collect accurate data on and provide a clear picture of the phenomenon under study."

The participants in the study were the fifty-two (52) administrators of ACED.PH member institutions such as Deans and Program Heads from various schools in Central Luzon offering programs under the Information Technology Education (ITE) and they were taken from a list of schools accredited by the Commission on Higher Education. In order to obtain a concrete result based on the current status of ITE programs in the region, all registered schools were chosen as participants but out of the fifty-two participants from the list only 53.85% took part of the research by answering the survey questionnaire which was sent to the registered email of the institutions and through posting of the survey link in the social media group of the association. Likewise, the same questionnaires were distributed to the deans and heads during the activities in the region such as PSITE-CL convention, ACED.PH trainings, and Industry Forum. The purposive sampling method was utilized in order to capture the target participants in the study.

The questionnaire was validated by administering it to five (5) trial respondents from various colleges and universities who were not included in the final data administration. Furthermore, the questionnaire was distributed to four (4) experts for content validation. The dry run was also used to test the administration of the questionnaire, the clarity of the contents, and the procedures and instructions that will be used in the final copy. All comments and suggestions made by trial respondents were incorporated into the final version of the questionnaire.

The first section of the questionnaire included questions about the schools as well as other pertinent information about the ITE program offerings. For Part 2, a structured questionnaire with 72 items was developed to determine the respondents' current status of ITE program offerings in terms of administration, faculty, curriculum, and laboratories. All items were scored using a 5-point Likert scale, with one (1) far below requirements, two (2) below requirements, three (3) meets requirements, four (4) above requirements, and five (5) far above requirements. Furthermore, another questionnaire was developed for each area to determine the schools' needs to improve the offerings of ITE programs in terms of administration, faculty, curriculum, and laboratories. The instrument was designed based on the instruments used by the Commission on Higher Education's Regional Quality Assessment Team. Cronbach's alpha was used to analyze the internal consistency of the questionnaire.

Cronbach's alpha using SPSS version 23 was .941 out of 72 items, which was greater than

the accepted value of 0.7 and indicated that the questionnaire passed the reliability test. The responses were tallied and tabulated using SPSS version 23 software and statistical treatment tools such as frequency counts, percentages, and weighted mean were used to provide a clear description and interpretation of the collected data.

Results and Discussion

The twenty-eight (28) participants in the study were schools offering Information Technology Education programs in Central Luzon and were granted Government Recognition by the Commission on Higher Education. The table below shows the distribution of participants based on their Type.

Table 1. Participants' Classification

Type of Higher Education Institution	Percentage
Public (SUC, LUC, LCC)	35.71
Private Higher Education Institutions	64.29

Furthermore, the study showed the status of IT Education programs in Central Luzon in terms of Administration, Faculty, Curriculum, and Laboratory. The table showed the highest and lowest mean ($\bar{x}$) as reflected in the results from the participants offering ITE programs were Above Requirement as shown in the results.

In the administration area, it showed that strategic planning is a regular cooperative activity that guides each unit of the school in achieving the institutional mission, vision, and educational goals of various programs, and deans and department chairs (or equivalent academic officers) participate in the budget development process for their respective areas of responsibility with a mean value of 3.71 and 3.54 respectively. It is noted that under administration, the schools in Central Luzon offering ITE programs were Above Requirement as shown in the results.

Table 2 Current Status of IT Education in Central Luzon

Areas	Program	Items	Mean ($\bar{x}$)	SD
Administration	CS, IT, IS, MC	Strategic planning is a regular cooperative activity that guides each unit of the school in achieving the institutional mission, vision, and educational goals of various programs	3.71	0.76
	CS, IT, IS, MC	Deans and department chairs (or equivalent academic officers) participate in the budget development process for their respective areas of responsibility	3.54	0.88
\	CS	At least 60% of the Professional courses are taught by Computer Science degree holders	3.7	0.94
		Faculty members have actively published in refereed journals and proceedings on a regular basis	2.2	0.78

Faculty Qualification	IT	At least 60% of the professional courses are taught by IT degree holders	3.94	0.94
		Faculty members hold doctorates in IT, IS, CS, or related fields.	2.5	1.32
	IS	Faculty members have at least two (2) years industry experience	3.71	0.75
		Faculty members are actively engaged in EMC research projects and development	4	1.41
	MC	At least 60% of the professional courses are taught by IT degree holders	2.5	0.7
		Faculty members' contracts have been notarized	3.61	0.78
Employment Status	CS, IT, IS, MC	Faculty members' salary rates are commensurate with their rank, academic preparation, experience in instruction and research	3.25	0.79
		Faculty members' contracts have been notarized	3.61	0.78
Curriculum	CS, IT, IS, MC	The revised copy of the curriculum was sent to CHED for content review	4.29	0.81
		The curriculum is enhanced through the feedback of partner industries or partner academies	3.18	1.36
Laboratories	CS, IT, IS, MC	At least nine (9) hours of individual hands-on computer time per week	3.75	0.83
		There is an annual laboratory safety training program for faculty members, lab technicians, student assistants, and students	2.75	0.96

In the faculty qualification, faculty members that have at least two (2) years of industry experience in Entertainment and Multimedia Computing posted the highest mean of 4.00 with a verbal interpretation of Above Requirement while in the same area but under the Information System, faculty members are actively engaged in IS research projects and development posted a mean of 2.40 with a verbal interpretation of Below Requirement. It was noted that the four (4) programs namely Computer Science, Information Technology, Information Systems, and Entertainment and Multimedia Computing posted the lowest mean on Research Engagement. This means that most of the faculty in IT Education in Central Luzon do not engage actively in research.

The students enrolled in ITE programs had a least nine (9) hours of individual hands-on computer time per week while the result showed that schools in Central Luzon offering ITE programs had no annual laboratory safety training program for faculty members, lab technicians, student assistants, and students as shown in the mean score of 2.75.

Table 3. Summary of the Results under the 4 Areas

Area	Mean	Interpretation
Administration	3.6	Above Requirement
Faculty	3.1	Meet Requirement
Curriculum	3.78	Above Requirement
Laboratories	3.34	Meet Requirement
Average Mean	3.46	Above Requirement

Table 4. Plan of Action

Area	Activities
Administration	Encourage Collaboration 1. Encourage joint research projects among ITE heads in the Region
Faculty Qualification	Supportive Infrastructure 1. Engage in a collaborative effort with Deans and Program Heads to conduct training sessions that focus on strengthening the research capabilities of IT Educators within the region. 2. Implement a research mentorship program involving Center of Excellence and Center of Development schools, aimed at motivating a higher number of faculty members to actively participate in research. 3. Promote international research and benchmarking
Curriculum	Industry Engagement 1. Organize industry academe round table discussions
Laboratories	Technical Support 1. Organize training on Strategic – Information System Planning

Based on the quantitative data and qualitative data gathered, Table 4 shows the plan of action the Association of Computing Education Deans and Program Heads has formulated and will be the priority project for a series of training sessions beginning school year 2023 – 2024. In order to improve the engagement of the faculty in Central Luzon in the area of research, the association will encourage joint research projects among member schools in the Region. With this, the schools identified as Center of Excellent and Center of Development will spearhead the mentorship program in research.

Conclusions

This study aimed to evaluate Information Technology (IT) education programs in Central Luzon, resulting in the following key findings: 1. Administrative Aspects: Most institutions in Central Luzon boast administrative structures that meet or exceed required standards. Regular strategic planning is a common practice, indicating a strong foundation for IT education in the region. 2. Faculty Qualifications: Faculty qualifications vary across IT programs.

While some, like Information Technology and Library Information Science, meet the requirements. Other areas require targeted development efforts to align with industry and educational standards. 3. Training and Program Needs: Various aspects, such as faculty support, are in line with requirements. However, faculty loading and other areas necessitate improvements to better address program needs effectively. 4. Curriculum and Laboratories: Most IT programs maintain updated curricula, demonstrating a commitment to staying current. Laboratory facilities generally meet basic requirements but could be enhanced by providing more advanced equipment in specific areas.

In conclusion, this study offers a comprehensive assessment of the IT education landscape in Central Luzon. While several aspects meet or exceed the stated requirements, some areas require focused attention and enhancements to keep up with the evolving demands of the IT industry and educational standards. The findings and recommendations from this study can serve as a valuable guide for educational institutions, policymakers, and stakeholders seeking to improve the quality and effectiveness of IT education in the region.

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