

A Quantitative Study on Graduate Employment Status Monitoring: Employability Outcomes, Job-Course Alignment, and Factors Influencing Career Entry Among Graduates of Selected Academic Programs in A Philippine Higher Education Institution

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ABSTRACT

Graduate employability continues to be a major indicator of the quality and relevance of higher education programs, particularly in the Philippine context where unemployment and skills mismatch among graduates are still prevalent concerns. It is a descriptive quantitative study conducted to monitor the employment status of graduates of selected academic programs and to identify factors affecting their employability. The study was conducted through 84 graduate respondents of AY 2020-2026 who answered the online survey questionnaire through google forms. Descriptive data were analyzed by frequency and percentage. To find out if there were a statistically significant differences in employment status across the demographic groups at the .05 level of significance, the Chi-Square Test of Independence and the Independent Samples t-Test were used. The results showed that about 69% of the respondents were employed in some form (41.7% full-time, 15.5% part-time and 11.9% self-employed) while the 26.2% were unemployed. A high level of job-course misalignment was clear, with only 35.7% of the employed graduates indicating that their job was closely related to their course or program. The most important employability factors were education, skills and experience, whereas the most mentioned challenges to employment were lack of work experience (54.8%) and limited job opportunities (41.7%). Inferential tests showed that there was no statistically significant difference in employment status between genders ($\chi^2 = 0.31$, $p = .581$) and no statistically significant difference in waiting time before first employment between male and female graduates ($t = 0.58$, $p = .565$) so that the null hypothesis was not rejected. The findings suggest that higher education institutions need to improve internship programs, enhance curriculum–industry alignment, and expand career guidance services to improve graduate employment outcomes.

Keywords: Higher Education; Skills Mismatch; Employment Status; Graduate Employability; Tracer Study; Job-Course Alignment; Descriptive Quantitative Research; Career Outcomes; Undergraduate Graduates; Labor Market; Higher Education Institutions.

1.0. Introduction

1.1. Background of the Study

Graduates' employability has become one of the primary focuses used by the higher education institutions (HEIs) to measure the effectiveness and relevance of academic programs. Colleges and universities are expected not only to provide quality education but also to ensure that the graduates possess the competencies, knowledge, and skills demanded by the labor market. Tracking the employment status of graduates allows the institutions to assess the effectiveness of their programs in preparing students for professional careers and the economic participation.

Despite the growing numbers of colleges graduates in every year, graduate unemployment and underemployment remain persistent problems in the Philippines. Like lack of work experience, skills mismatches, and highly competitive labor market conditions make it difficult for many graduates to secure the employment aligned with their field of specialization. But the higher education institutions are encouraged to implement the graduate tracer studies and employment monitoring initiatives to gather data on employment outcomes and identify areas for academic enhancement.

Monitoring graduates employment yields a valuable information on the employment rates, job relevance, salary levels, waiting time before employment, and factors influencing employability. Tracer studies have demonstrated that the institutions which consistently monitor graduate employment are better equipped to align the curricular programs with the industry needs and improve the competitiveness of their graduates. Research also confirms that the employability is shaped by communication skills, technical competencies, internship exposure, and institutional support services (RSIS International).

This study aims to determine the employment status of graduates and identify the factors influencing their employability. The purpose of the findings is intended to guide the educational institutions in improving curriculum design, career guidance programs, and alumni engagement efforts in order to enhance graduate employment outcomes.

1.2. Statement of the Problem

This study aimed to determine the employment status of graduates and assess factors influencing their employability. Specifically, this study seeks to answer the following questions:

First, what is the demographic profile of the respondents in terms of age, sex, course or program completed, and academic year graduated? Second, what is the employment status of graduates in terms of employment type, job relevance to course, waiting time before employment, and monthly income? Third, what are the factors significantly influence graduate employability? Fourth, is there a significant difference in employment status when respondents are grouped according to demographic profile? Finally, what challenges are encountered by graduates in seeking employment?

1.3. Hypotheses

The following null and alternative hypotheses were tested at the 0.05 level of significance:

1. Null Hypothesis (H_0): There is no significant difference in graduate employment status when respondents are grouped according to demographic profile.
2. Alternative Hypothesis (H_1): There is a significant difference in graduate employment status when respondents are grouped according to demographic profile.

1.4. Significance of the Study

The findings of this study may benefit the following stakeholders:

- Higher Education Institutions – The study may help improve curricular offerings, career services, and employability programs by identifying gaps between academic preparation and industry requirements.
- Graduates – The study provides awareness of employability skills and labor market demands, enabling graduates to make informed career decisions.
- Faculty Members – Results may guide instructors in enhancing teaching strategies, incorporating practical experiences, and strengthening industry linkages.

- Future Researchers – The study may serve as reference material for future tracer studies, employability research, and graduate monitoring initiatives.

1.5. Scope and Delimitation

This study focused on monitoring the employment status of graduates from selected academic programs of a higher education institution. The research included graduates from Academic Years 2020–2026 who responded to an online survey questionnaire ($n = 84$). The study was limited to employment-related variables such as employment status, job alignment, waiting time before employment, monthly income, employability factors, and employment challenges. It did not cover advanced psychometric profiling or institutional-level policy analysis.

2.0. Review of Related Literature and Studies

2.1. Related Literature

Higher education institutions use employment outcomes and graduate tracer studies as important tools to determine whether graduates can effectively apply the knowledge and skills obtained from their academic programs in real-world employment settings. According to Krasna et al. (2021), schools and programs strive to produce graduates ready for professional careers; therefore, employment outcomes are a critical indicator of educational success. Graduate employment data also aid in curriculum development, workforce preparation, and alignment with labor market demand.

Graduate tracer studies are widely used to assess the relationship between education and employment. Ramos (2024) explained that tracer studies monitor the career trajectories of graduates to evaluate employment status, job satisfaction, competencies, and work-related values acquired from school. These studies provide valuable information on whether educational institutions are producing graduates whose competencies match industry needs.

Furthermore, the employability of graduates reflects the quality of instruction and training provided by higher education institutions. According to Ramos (2024), competencies such as communication skills, information technology skills, problem-solving skills, and human relations skills are among the most useful competencies graduates apply in their first jobs. Work-related values such as honesty, professionalism, creativity, and perseverance also contribute significantly to employment success.

The rapid advancement of technology has also influenced employment monitoring systems. Wei et al. (2021) emphasized that data mining technology can improve the monitoring of graduates' employment status by enabling institutions to collect accurate and real-time employment data. Universities that adopt such systems can analyze employment trends, evaluate curriculum effectiveness, and enhance graduate competitiveness.

Krasna et al. (2021) further noted that employment outcome research remains inconsistent because many institutions use different methods, timelines, and classifications when gathering graduate employment data. Despite these limitations, employment outcome studies remain essential in identifying workforce needs and ensuring that academic programs remain responsive to industry demands.

2.2. Related Studies

According to Krasna et al. (2021) examined the postgraduate employment outcomes of undergraduate and graduate public health students and showed that the employment outcomes are important indicators of institutional preparedness. The study also revealed differences in the collection of employment data, and recommended standardized protocols for future studies on graduate employment.

Wei et al. (2021) also studied the relationship monitoring of employment status of graduates based on data mining technology. They pointed out that the accurate employment monitoring system is important for the evaluation of university performance and graduate employability. The study recommended the universities use technological systems in order to efficiently collect employment data and help in improving curriculum.

Ramos (2024) conducted a graduate tracer study for the graduates of Bachelor of Science in Information Technology in Lyceum of the Philippines University-Batangas and discovered that 90% of graduates were employed. The skills that were very relevant in their jobs were communication skills, information technology skills, and human relations skills. The study found work-related values such as creativity, honesty and dedication were also important in success in employment.

The studies reviewed are related to the present research as they all concern graduate employability, competencies, work-related values, and employment outcomes. The studies provide evidence that tracer studies are effective tools in assessing the relevance of academic programs to labor market demands.

2.3. Conceptual Framework

The study is anchored on the Systems Model of Graduate Employability, which posits that inputs (educational preparation, competencies, and graduate profile) are processed through institutional mechanisms (survey data collection and analysis) to produce outputs (employment outcomes and program recommendations).

3.0. Research Methodology

3.1. Research Design

This study used a quantitative descriptive research design. Descriptive research was used to methodically explain the characteristics, behaviors and experiences of the population of respondents with regard to their employment status. This approach is consistent with the graduate tracer studies, which are primarily concerned with documenting the employment outcomes and tracing trends across graduate cohorts (Ramos, 2024). Inferential statistics were employed to ascertain if there were significant differences in employment status by demographic group.

3.2. Respondents of the Study

The respondents of this study were the graduates from selected academic programs of a higher education institution who have completed their degrees from Academic Year 2020–2021 up to Academic Year 2025–2026. The survey instrument was completed by 84 graduates. Purposive and convenience sampling were employed, as the survey was distributed digitally through available alumni networks, class group chats, and social media platforms. Graduates who were reachable and willing to participate were included in the study.

3.3. Research Instrument

The primary instrument for data collection was the online survey questionnaire developed by the researcher. It was filled in through Google forms. The questionnaire was divided into three parts, namely, (1) Basic Information that contained the demographic profile such as academic year graduated, course/program, age, and gender; (2) Employment Status that determined the current employment type, monthly income, waiting time before first employment, job relevance to course, and employer sector; and (3) Employment Experience that determined the factors that helped respondents get employed and the challenges they encountered during their job search.

The survey questions were a combination of multiple choice and checklist type questions. The content validity was established through a peer review by the team members as well as the indicators used in the previous tracer studies (Krasna et al., 2021; Ramos, 2024).

3.4. Data Collection Procedure

The survey was distributed online through Google Forms from April to May 2026. The link was shared via official alumni group chats, social media (Facebook) and researchers' personal networks. Participants were informed about the purpose of the study and that participation was voluntary and anonymous. Respondents digitally provided informed consent before proceeding to the survey. The analysis was based on 84 complete responses.

3.5. Statistical Treatment of Data

The following statistical tools were used to analyze the data:

- Frequency and Percentage – To describe the demographic profile of the respondents and employment status.
- Weighted Mean – To determine the level of agreement of the respondents on employment related issues.
- Chi-Square Test of Independence (χ^2) – Is used to classify if there is a significant connection between the employment status and the categorical population variables like the (gender, academic year graduated, course/program).
- Weighted Mean – To determine the level of agreement of the respondents on employment related issues.

All inferential tests were performed at the 0.05 level of significance. The null hypothesis was rejected at a p value of <0.05. Statistical calculations were done in Microsoft Excel and were verified by hand.

4.0. Results and Discussion

4.1. Part I: Demographic Profile of the Respondents

Academic Year Graduated

The range of respondents by academic year of graduation is shown in Table 1. Most of the respondents were graduates of the Academic Year 2024–2025 (33.3%, $n = 28$), followed by the graduates of Academic Year 2023–2024 (15.5%, $n = 13$). Graduates of AY 2025–2026 and AY 2022–2023 composed 13.1% ($n = 11$) of the sample. The remaining respondents were graduates from AY 2020–2021, AY 2021–2022, and 2026.

Table 1. Frequency and Percentage Distribution of Respondents by Academic Year Graduated (n = 84).

Academic Year Graduated	Frequency (f)	Percentage (%)
AY 2020–2021	4	4.8
AY 2021–2022	5	6.0
AY 2022–2023	11	13.1
AY 2023–2024	13	15.5
AY 2024–2025	28	33.3
AY 2025–2026	11	13.1
2026	12	14.3
Total	84	100.0

Age

Table 2 presents the age distribution of the respondents. The ages ranged from 18 to 36 years. The modal mean age was 24 years (17.9%, n = 15), followed by age 25 (14.3%, n = 12), age 26 (10.7%, n = 9), age 23 (15.5%, n = 13) and age 22 (13.1%, n = 11). This pattern corresponds with the typical age range of fresh graduates in the Philippine higher education context, where most of the students finish their undergraduate degrees between the ages of 21 and 25.

Table 2. A Frequency and Percentage Distribution of Respondents by Age Group (n = 84) within the Philippine Higher Education Context.

Age	Frequency (f)	Percentage (%)
18–20	4	4.8
21–23	34	40.5
24–26	36	42.9
27 and above	10	11.9
Total	84	100.0

Gender

Table 3 shows that the majority of the respondents were female (64.3%, n = 54) and while male respondents made up 33.3% (n = 28). Two respondents (2.4%) did not want to specify their gender. The sample proved female-dominant, following the usual trend in Philippine higher education that female enrollment and graduation rates are always higher than that of males (Commission on Higher Education, 2023).

Table 3. Frequency and Percentage Distribution of Respondents by Gender (n = 84)

Gender	Frequency (f)	Percentage (%)
Male	28	33.3
Female	54	64.3
Prefer not to say	2	2.4
Total	84	100.0

4.2. Part II: Employment Status of Graduates

Current Employment Type

Table 4 shows that the current employment status of the respondents. The data show that 41.7% (n = 35) were employed full-time, 15.5% (n = 13) were employed part-time and 11.9% (n = 10) self-employed, with an overall employment rate of 69.0%. Meanwhile, 26.2% (n=22) were unemployed and a small percentage were studying at the present time. The total employment rate, which is around 69%, is lower in comparison to the 90% employment rate reported by Ramos (2024) for BSIT graduates in the same institutional setup, suggesting that graduates from multi-disciplinary programs may face more difficulties in finding employment.

Table 4. Frequency and Percentage Distribution of Respondents by Current Employment Status (n = 84)

Employment Status	Frequency (f)	Percentage (%)
Employed (Full-time)	35	41.7
Employed (Part-time)	13	15.5
Self-employed	10	11.9
Unemployed	22	26.2
Currently Studying	4	4.8
Total	84	100.0

Waiting Time Before First Employment

As presented in Table 5, 31.0% (n = 26) of the respondents acquired their first job in less than three months after graduation, which was the most common response among the respondents with employment experience. Another 22.6% (n = 19) waited 3–6 months, and 11.9% (n = 10) waited 6–12 months. Only 8.3% (n = 7) were unemployed for more than one year before getting a job. Significantly, 26.2% (n = 22) reported “not applicable” which corresponds to the proportion of unemployed respondents or those currently studying. The results show that the majority of employed graduates found a job within the first six months after graduation.

Table 5. Distribution of Respondents by Waiting Time Before Employment (n = 84)

Waiting Time	Frequency (f)	Percentage (%)
Less than 3 months	26	31.0
3–6 months	19	22.6
6–12 months	10	11.9
More than 1 year	7	8.3
Not applicable	22	26.2
Total	84	100.0

Job Relevance to Course

Table 6 shows that only 35.7% (n = 30) of respondents reported that their current job is directly related to their course/program. A major 46.4% (n = 39) stated that their job is not related to their course and 17.9% (n = 15) stated that their job is partially related. This high level of job-course mismatch (64.3% combining “not related” and “partially related”) reflects the broader issue of curriculum-industry alignment in Philippine higher education, consistent with research noting persistent skills mismatch (RSIS International).

Table 6. Frequency and Percentage Distribution of Respondents by Job Relevance to Course (n = 84)

Job Relevance	Frequency (f)	Percentage (%)
Yes (Directly related)	30	35.7
No (Not related)	39	46.4
Partially related	15	17.9
Total	84	100.0

Type of Employer/Company

Table 7 shows the type of institution respondents are currently employed in. 29.8% (n=25) of the respondents were working in a private company while 26.2% (n=22) were in government institutions. Small proportions were self-employed or working in NGOs. The “not applicable” category accounts for 35.7% of those unemployed or studying. The relatively large proportion of government employment among respondents may be due to the steady demand for government jobs among graduates of education and criminology programs.

Table 7. Frequency and Percentage Distribution of Respondents by Type of Employer (n = 84)

Type of Company/Institution	Frequency (f)	Percentage (%)
Government	22	26.2
Private Company	25	29.8

Self-employed/Business	5	6.0
Non-Government Organization (NGO)	2	2.4
Not applicable	30	35.7
Total	84	100.0

Monthly Income Range

Table 8: The distribution of monthly income of respondents. Of those who disclosed their income, 25.0% (n=21) earned between ₱10,000 and ₱20,000, and 19.0% (n=16) earned below ₱10,000. Only 7.1% (n = 6) said they had a monthly income of ₱20,001 to ₱30,000, and less than 5% earned above ₱30,000. The high proportion of respondents (44.0%, n = 37) who preferred not to disclose their income limits full interpretation; however, the visible data suggest that a significant share of employed graduates earns at or near the minimum wage level, which may be indicative of underemployment.

Table 8. Frequency and Percentage Distribution of Respondents by Monthly Income Range (n = 84)

Monthly Income Range	Frequency (f)	Percentage (%)
Below ₱10,000	16	19.0
₱10,000 – ₱20,000	21	25.0
₱20,001 – ₱30,000	6	7.1
₱30,001 and above	4	4.8
Prefer not to say	37	44.0
Total	84	100.0

4.3. Part III: Factors Influencing Graduate Employability

Factors That Helped Graduates Get Employed

Table 9 summarizes the factors that respondents reported as having helped them to find employment. Both educational background and skills/experience were cited by 33.3% of respondents, making them the most commonly mentioned factors of employability. The 19.0% of the respondents cited internship/OJT experience, in line with research emphasizing the importance of practical training in employability (Ramos, 2024). Smaller proportions mentioned communication skills and personal recommendations or connections.

Table 9. Frequency and Percentage Distribution of Factors Influencing Graduate Employment (n = 84)

Factor	Frequency (f)	Percentage (%)
Educational background	28	33.3
Skills and experience	28	33.3

Internship/OJT experience	16	19.0
Communication skills	5	6.0
Recommendations/Connections	4	4.8
Others/Not applicable	3	3.6
Total	84	100.0

Challenges Encountered in Finding Employment

Table 10 shows lack of work experience was the most common challenge reported (54.8%; $n = 46$). 41.7% ($n = 35$) limited job opportunities and 26.2% ($n = 22$) low salary offer. 23.8% ($n=20$) gave personal reasons, and 19.0% ($n=16$) cited skills mismatch. More than one selection allowed, therefore totals will be over 100%. These findings confirm the literature that identifies the job experience gaps and structural labor market constraints as the main challenges to graduate employment in the Philippines (RSIS International).

Table 10. Frequency Distribution of Challenges Encountered in Finding Employment ($n = 84$)

Challenge	Frequency (f)	Percentage (%)
Lack of work experience	46	54.8
Limited job opportunities	35	41.7
Low salary offers	22	26.2
Personal reasons	20	23.8
Skills mismatch	16	19.0

4.4. Part IV: Statistical Analysis – Test of Significant Differences

To test the hypothesis that there is no significant difference in employment status when respondents are grouped according to demographic profile, a Chi-Square Test of Independence and an Independent Samples t-Test were applied.

Chi-Square Test: Employment Status by Gender

A Chi-Square Test of Independence and Independent Samples t-Test were used to test the null hypothesis that there is no significant difference in the employment status of respondents grouped according to demographic profile.

Table 11. Chi-Square Test of Independence Between Gender and Employment Status ($n = 84$)

Gender	Employed (f)	Not Employed (f)	Total
Male	18	10	28

Female	38	16	54
Total	56	26	82

$$\chi^2(1, N = 82) = 0.31, p = .581$$

A Chi-Square Test of Independence was conducted to examine if gender is significantly related to employment status (employed vs. unemployed). The respondents' employment status was divided into two categories: employed (full-time, part-time or self-employed; $n = 58$) and not employed (unemployed or currently studying; $n = 26$). The observed and expected frequencies are shown in Table 11.

Independent Samples t-Test: Waiting Time by Gender

An independent sample t-test was performed to determine whether there is a significant difference in waiting time before first employment between male and female graduates. Only respondents who provided a valid waiting time (i.e. excluding 'not applicable') were included ($n = 62$). Waiting time categories were recorded as numerical midpoints: <3 months = 1.5, 3–6 months = 4.5, 6–12 months = 9, >1 year = 15. Group statistics are shown in Table 12.

Table 12. Independent Samples t-Test of Waiting Time Before First Employment by Gender

Gender	N	Mean (months)	SD
Male	22	4.68	3.84
Female	40	4.13	3.62

$$t(60) = 0.58, p = .565, \text{two-tailed}$$

There was no statistically significant difference in waiting time before first employment between male graduates ($M = 4.68$, $SD = 3.84$) and female graduates ($M = 4.13$, $SD = 3.62$), $t(60) = 0.58$, $p = .565$. The p-value is .565. It is more than the significance level of 0.05. Hence, we fail to reject the null hypothesis. These results suggest that gender does not significantly influence how quickly graduates secure employment after graduation.

Summary of Hypothesis Testing

As shown by the results of both the Chi-Square test and the independent samples t-test, the null hypothesis is not rejected. There is no significant difference in the employment status of the graduates when the respondents are classified each by their demographic profile. These findings align with the larger literature showing that the demographic variables by itself are not a good predictor of the employment outcomes; like the competencies, work experience and structural labor market conditions are more determinative (Krasna et al., 2021; Ramos, 2024).

5.0. Summary, Conclusions, and Recommendations

5.1. Summary

This quantitative descriptive study was conducted to monitor the employment status of the graduates of selected academic programs and to assess the factors affecting their employability. An online survey questionnaire was

distributed to 84 graduate respondents in the Academic Years 2020–2026. The descriptive statistics (frequency and percentage) were used in profiling the respondents and documenting the employment outcomes. Both Chi-Square and t-test (inferential statistics) were used to test for the significant differences in employment status among the demographic groups.

The key findings were that (1) approximately 69% of respondents reported some form of employment, (2) only 35.7% reported being employed in a position directly related to their course, (3) educational background and skills and experience were the primary self-reported factors influencing employability, (4) lack of work experience (54.8%) and limited job opportunities (41.7%) were the most frequently reported barriers to employment and (5) there was no statistically significant difference in employment status across gender groups ($\chi^2 = 0.31$, $p = .581$) or in waiting time to employment by gender ($t = 0.58$, $p = .565$).

5.2. Conclusions

Based on the findings of the study, the following conclusions are drawn:

- Most of the graduates from the surveyed questioners programs were employed, however a large proportion (26.2%) remained unemployed, suggesting that there is a need for stronger employability support structures.
- The high rate of job–course misalignment (64.3%) suggests that the curriculum programs may not be fully aligned with the labor market demands, and that many graduates accept employment outside their field of specialization.
- The most important employability enablers identified were educational preparation and skills development, stressing the ongoing importance of academic training for graduate career outcomes.
- The greatest obstacles to employment after graduation continue to be a shortage of work experience and limited job opportunities, which require the expansion of internship programs and industry partnerships.
- Gender was not a significant predictor of employment status or waiting time before employment, suggesting the hiring practices among the surveyed graduates' employers may be relatively gender-neutral.

5.3. Future Research Directions

Based on the findings and limitations of this study, the following directions are recommended for future research:

1. Future studies should employ larger and more representative samples through random sampling methods to enhance the generalizability of findings across diverse institutions and program types.
2. A longitudinal tracer study design spanning 5–10 years post-graduation would provide a more comprehensive picture of how graduate employment outcomes evolve over time, particularly in relation to career mobility and salary progression.
3. Researchers should investigate additional demographic variables such as socioeconomic background, geographic location, and specialization track to provide a more nuanced understanding of employability disparities among graduates.

4. Mixed-methods approaches combining quantitative surveys with in-depth interviews of graduates and employers would yield richer insights into the causes of job-course misalignment and perceived skills gaps in the labor market.
5. Future studies may explore the potential of machine learning and data-driven approaches for predictive graduate employment monitoring systems, enabling institutions to proactively address employability gaps before graduates enter the workforce (Chen et al., 2025; Nouib et al., 2025).
6. Comparative studies across multiple higher education institutions in the Philippines and the ASEAN region would help benchmark employability outcomes and identify best practices in graduate career support services.

5.4. Recommendations

Based on the conclusions, the following recommendations are offered:

- Higher Education Institutions need to strengthen the OJT and practicum programs to fill a widely reported lack of work experience among new graduates.
- Curriculum committees should engage in regular industry meetings to ensure that the program outcomes meet the current labor market demand, therefore reducing job-course mismatch.
- Career guidance offices should provide targeted employment services like job fairs, resume-writing workshops, and employer networking events to support graduates' transition from school to work.
- Future researchers are encouraged to increase sample size and include longitudinal tracking of graduates across several cohorts for more generalizable data on employment trends.

Institutions may consider the implementation of a standardized graduate tracer system in accordance with CHED guidelines to facilitate systematic employment monitoring across the institution.

6.0. Ethics and Limitations

6.1. Ethical Considerations

This study was conducted in accordance with the established ethical principles for research with individuals. The following ethical safeguards were followed in the research process:

1. **Consent to Participate:** The purpose, scope, and voluntary nature of the study were explained to all the participants before they accessed the survey instrument. Digital consent was obtained by means of an acknowledgment statement at the top of the Google Form. Participation was completely voluntary and respondents could withdraw at any stage without penalty.
2. **Confidentiality and Anonymity:** The survey did not collect any personally identifiable information such as full names, addresses or contact numbers. The answers were securely stored in the researchers' Google Forms account, and only accessible to authorized team members. The reported data do not allow the identification of any individual respondent.

3. **Data Integrity:** Researchers accurately transcribed and reported the survey data. There was no falsification, manipulation or selective exclusion of data to obtain favourable results. The complete statistical computations are given step-by-step in Chapter 4.
4. **Participant safety:** The survey did not involve any psychological, physical or social risk to respondents. The questions were restricted to employment issues and contained no sensitive or potentially upsetting material. Respondents who declined to provide income information were given a “prefer not to say” choice.
5. **Type I and Type II Error Risks:** The study recognizes the risk of Type I error by falsely rejecting a true null hypothesis and while the Type II error failing to reject a false null hypothesis. To manage for such a risks, a standard significance level of $\alpha = 0.05$ was employed. The small sample size ($n = 84$) increases the risk of Type II error, and could restrict the power of inferential tests to detect small but meaningful differences.

6.2. Limitations of the Study

The following limitations are acknowledged:

- **Sample Size and Coverage:** The study was confined to 84 respondents which may not be representative of all graduates of the institution. The results cannot be generalized as the study used convenience and purposive sampling instead of random sampling.
- **Self-Reported Data:** All data were self-reported and therefore the subject to social preference bias and recall mistakes. The respondents may over-report or under-report income, employment status, or the other sensitive information.
- **Cross-Sectional Design:** The research study also evaluated the employment status at a specific period in time. Then a longitudinal approach would give a stronger understanding of how the graduate employment outcomes change over time.
- **Income Data Missingness:** The high percentage of the respondents (44.0%) that refuses to report their income range limits the completeness of the income-related analysis.

Limitation of Demographic Variables: The study investigated that only the employment differences by their gender and academic year. For the future research should discover more population factors, such as the program type, geographic location, and socioeconomic background.

Declarations

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Competing Interests Statement

The authors declare no conflict of interest regarding the publication of this manuscript.

Consent for publication

All authors have read and agreed to the published version of the manuscript.

Author's Contribution

All authors contributed equally to the conceptualization, data collection, analysis, and writing of this manuscript.

Informed Consent

Informed consent was obtained from all participants prior to their participation in the survey. Participation was entirely voluntary and anonymous.

Availability of Data and Material

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Institutional Review Board Statement

Not Applicable. The study involved voluntary, anonymous online survey participation with no identifying information collected and no physical or psychological risk to participants.

Ethical Approval

The study was conducted in accordance with established ethical principles for research involving human participants. All participants provided digital informed consent before accessing the survey instrument.

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Declaration of Artificial Intelligence

The authors declare that no artificial intelligence tools were used in the writing, data analysis, or interpretation of findings in this manuscript. All content was produced solely by the authors.

References

- [1] Abelha, M., Fernandes, S., Mesquita, D., & Borges, F.I.B.S. (2020). Graduate employability and competence development in higher education — A systematic literature review using PRISMA. *Sustainability*, 12(15), 5900. <https://doi.org/10.3390/su12155900>.
- [2] Alharbi, F., & Al-Alawi, A. (2024). Labor market prediction using machine learning methods: A systematic literature review. *Semantic Scholar*. <https://doi.org/10.14569/ijacsa.2024.0150301>.
- [3] Althubiti, A., Alharthi, R., Alqarni, R., Alharthi, H., Alzahrani, F., Alotaibi, S., Al-Qahtaniy, M., & Alnfiai, M. (2024). Graduates' progression tracking system. *Journal of the Korea Institute of Information and Communication Engineering*. <https://koreascience.kr/article/jako202419264110215.page>.

- [4] Barachino, H., Timmermans, A., Venhorst, V.A., & van Dijk, J. (2025). Operationalization of graduate employability interventions in higher education – A systematic review. *Education + Training*, 67(10): 89–108. <https://doi.org/10.1108/et-01-2025-0013>.
- [5] Baucas, R.C. (2024). The mathematics performance and the track preference of grade 10 students. *International Journal of Multidisciplinary Educational Research and Innovation*, 2(6): 2340–2347.
- [6] Bindiya, M.K., Abhijna, S., Rawat, A., Anushri, N.R., & Gowda, I.L. (2022). Post graduate admission prediction system. *International Journal of Innovative Research in Science, Engineering and Technology*, 11(3): 2248–2256. <https://doi.org/10.15680/ijirset.2022.1103162>.
- [7] Chen, L.-S., Huynh-Cam, T.-T., Nguyen, V.-C., Lu, T.-C., & Le-Huynh, D.-K. (2025). Predicting early employability of Vietnamese graduates: Insights from data-driven analysis through machine learning methods. *Big Data and Cognitive Computing*, 9(5): 134. <https://doi.org/10.3390/bdcc9050134>.
- [8] Cieciora, M., Bołkunow, W., Pietrzak, P., & Kucharska, A. (2025). Graduate career tracking systems of higher education institutions – A systematic literature review. *Scientific Papers of Silesian University of Technology: Organization and Management Series*, 232: 111–134. <https://doi.org/10.29119/1641-3466.2025.232.7>.
- [9] Commission on Higher Education (2023). Higher education enrollment by sex, AY 2022–2023. CHED Statistical Bulletin.
- [10] Du Plessis, D.J., Angula, N., Du Plessis, C.C., & Tokwe, C. (2024). The impact of university-industry collaboration on graduate employability after COVID-19: A literature review. *Management and Economics Research Journal*. <https://doi.org/10.18639/merj.2024.9900060>.
- [11] Faizan, M., Huang, Q., Riaz, N., & Saif, U. (2024). From academia to industry: A framework to securely implement big data and AI to predict college graduates' employment trajectories. *International Journal of Scientific Research and Analysis*. <https://ijsra.net/content/academia-industry-framework-securely-implement-big-data-and-ai-predict-college-graduates>.
- [12] Decision Support System definition (2022). Retrieved from <https://investopedia.com>.
- [13] Gonzales, J.G., Lagman, A.C., De Angel, R.M., Raguro, M.C.F., Bulacan, R.C.A., & Canlas, J.D. (2024). Graduate tracer monitoring platform with decision support feature and mapping recommendations analysis using rule-based algorithm. In *Proceedings of the 2024 IEEE 15th Control and System Graduate Research Colloquium (ICSGRC)*, Pages 261–266, IEEE. <https://doi.org/10.1109/icsgrc62081.2024.10691266>.
- [14] Haque, R., Quek, A., Ting, C.-Y., Goh, H.-N., & Hasan, M.R. (2024). Classification techniques using machine learning for graduate student employability predictions. *International Journal on Advanced Science, Engineering and Information Technology*. <https://doi.org/10.18517/ijaseit.14.2.19549>.
- [15] Kishore, R., Singh, S., & Vanishree, K. (2025). GradLink Connect. Semantic Scholar. <https://www.semantic-scholar.org/paper/gradlink-connect-kishore/4503fe3624ff904fe5dd911109375e81ab4f6675>.

- [16] Krasna, H., Czabanowska, K., Frenk, J., & Bhutta, Z.A. (2021). Postgraduate employment outcomes of public health graduates: A scoping review. *Public Health Reviews*, 42: 1604088. <https://doi.org/10.3389/phrs.2021.1604088>.
- [17] Li, L. (2025). Prediction of graduate employment based on multi-source data fusion and cost-sensitive multi-objective learning. *Semantic Scholar*. <https://doi.org/10.1016/j.eswa.2025.125712>.
- [18] Ma, Y., & Bennett, D. (2024). Analyzing predictors of perceived graduate employability from sufficiency and necessity perspectives. *Higher Education*. <https://doi.org/10.1007/s10734-024-01221-1>.
- [19] Nouib, H., Aghoutane, B., El Alami, J., Benabbou, F., & El Faddouli, N. (2025). Predicting graduate employability using hybrid AHP–TOPSIS and machine learning: A Moroccan case study. *Technologies*, 13(9): 385. <https://doi.org/10.3390/technologies13090385>.
- [20] Pacleb-Ulanday, M.L. (2021). Tracer study and employability skills acquisition of teacher education graduates. *Psychology and Education Journal*, 58(4): 1678–1683. <https://doi.org/10.17762/pae.v58i4.3268>.
- [21] Patulin, E.P., Degamon, L.S., Borja, E.A., & Vasquez, M.C.S. (2024). Tracer study of education and graduate program alumni (2016–2022) at Surigao Del Norte State University. *Journal of Interdisciplinary Perspectives*, 2(7): 255–268. <https://doi.org/10.69569/jip.2024.0227>.
- [22] Rahman, A., Keat, L.S., & Omar, R. (2025). Research institutions roles in enhancing employability: Bridging the gap between education and market needs. *Semantic Scholar*. <https://doi.org/10.1080/1360080x.2025.2301450>.
- [23] Ramos, M.A. (2024). Graduate tracer study of Bachelor of Science in Information Technology graduates of Lyceum of the Philippines University-Batangas. *Asia Pacific Journal of Multidisciplinary Studies*, 7(2): 78–89. <https://research.lpubatangas.edu.ph/wp-content/uploads/2024/07/11.-apjmsd-2024-07.pdf>.
- [24] Shoaib, M., Afridi, M.U., & Husnain, G. (2026). Forecasting algorithm for the vocational mobility of graduates with multiple attributes. *Expert Systems with Applications*. <https://doi.org/10.1016/j.eswa.2025.126312>.
- [25] Tirado-Picado, V., Navarrete-Orozco, E., Mejía-Ponce, M.F., & Guerrero-Guillén, R. (2024). Model for the implementation of graduate and candidates for graduates tracking system at the American University, Nicaragua. *International Journal of Science, Technology and Society*, 12(6): 159–166. <https://doi.org/10.11648/j.ijsts.2024.1206.11>.
- [26] Trujillo, F., Pozo, M., & Suntaxi, G. (2025). Artificial intelligence in education: A systematic literature review of machine learning approaches in student career prediction. *Semantic Scholar*. <https://doi.org/10.1007/s10639-025-13201-8>.
- [27] Wang, T. (2022). Application of new technology in education: Design and implementation of graduate certificate model based on intelligent graph element technology. *Sustainability*, 14(7): 3781. <https://doi.org/10.3390/su14073781>.

[28] Wei, X., Zhang, Y., & Liu, H. (2021). Dynamic monitoring of graduates' employment status based on data mining technology. *Journal of Physics: Conference Series*, 1915(3): 032062. <https://doi.org/10.1088/1742-6596/1915/3/032062>.

[29] Wen, K., & Zhou, D. (2025). Predictive career guidance and entrepreneurial development for university students using artificial intelligence and machine learning. *Journal of Higher Education Theory and Practice*. <https://journals.sagepub.com/doi/10.1177/14727978251318801>.

[30] Young, M.E., Miller, M., Urban, C., & Petrescu, C. (2024). Tracking student progress through graduate programs. *Discover Education*, 3: 43. <https://doi.org/10.1007/s44217-024-00129-3>.