

Tracers Study on the Graduates Bachelor of Science in Automotive Technology in Bukidnon State University

Dr. Rene M. Chavez ¹, Nicolas S. Carisosa Jr.², Rodulfo S. Oco Jr.³, Jeston D. Delos Reyes⁴

Faculty, Automotive Technology Department, College of Technologies

Bukidnon State University- Main Campus, Fortich Street, Malaybalay City, Bukidnon 8700, Philippines

Abstract—The rapid evolution of automotive technology necessitates constant alignment between educational curricula and industry requirements. This study tracks the employability and performance of Bukidnon State University (BukSU) Automotive Technology graduates from 2019 to 2023, utilizing a mix method research design. Key objectives included assessing graduates' performance in licensure and government exams, their employment status, entrepreneurial achievements, and employer feedback. Findings indicate that 34.3% of graduates passed Automotive Servicing NC1 and NC2 exams. Entrepreneurial pursuits were minimal, with only 2.86% of graduates becoming entrepreneurs, while 97.14% found employment, predominantly as technicians and mechanics (81%). Employment status showed 74% in regular employment, 18% in temporary roles, 6% under contractual terms, and 3% self-employed. Notably, 97.14% worked domestically, with a small fraction (2.86%) employed abroad. Most graduates occupied technical positions (96%), with a minority in managerial (3%) and supervisory (1%) roles. Employers expressed high satisfaction with BukSU graduates, particularly valuing their practical skills, work ethic, and positive impact on productivity. The hands-on training provided by the curriculum was credited for the graduates' proficiency in automotive maintenance, diagnostics, and repair. The study concludes that BukSU's Automotive Technology program effectively aligns with industry needs, ensuring high employability for graduates. However, the low entrepreneurial engagement highlights barriers such as limited access to capital and inadequate training. Enhancing entrepreneurial education and supporting the transition from temporary to regular employment could further improve graduate outcomes. Continuous employer feedback and curriculum adjustments are essential to maintain the high employability and performance of BukSU graduates in the dynamic job market.

Keywords: Graduate Tracer Study, Automotive Technology, Employability, Performance of Graduates, Bukidnon State University

1. Introduction

Automotive technology is a rapidly evolving field, and the skills and knowledge that employers are looking for in graduates are constantly changing. As a result, it is important for educational institutions to regularly track the progress and outcomes of their automotive technology graduates to ensure that their programs are meeting the needs of the industry. A graduate tracer study is a research study that tracks the progress of graduates after they have left school. It is a valuable tool for educational institutions to assess the effectiveness of their programs and to identify areas for improvement. The study of [1] it states that it is crucial for fresh graduates to have knowledge in their own disciplines when seeking employment, it is becoming increasingly important that their hard skills are complemented by a good

blend of personal qualities and skills which can in turn enhance their employability. These claims were also supported with the study of [2] that emphasize that people need to acquire skills to be productive and earn a living and all of these can be achieved through education. In addition, the authors also mention that education is the most important mechanism for the empowerment of people for their socio-economic, political and technological development.

The number of graduates in any academic degree and their employability is among the measures of the success of a Program [3]. The best method to validate the academic program achievement is through a tracer study to monitor the status of the graduates. Graduate and employer tracer surveys constitute one form of an empirical study that can provide valuable information for evaluating the

results of the education and training of a specific institution of higher education [4]. [5] states that “they provide quantitative structural data on employment and career, the character of work and related competencies, and information on the professional orientation, and experiences of their graduates.” Additionally, the collected data is an important indicator of the quality of higher education [6]. This information may be used for further development of the institution and the academic program in particular in the context of quality assurance. An advanced approach for tracer studies will enable the institution of higher education to get information to indicate possible deficits in a given educational program and to serve as a basis for future planning activities. Therefore, information on the professional success or employment transitions/promotions of the graduates are needed as well as information on the relevance of knowledge and skills. The general goal of all graduate programs in education and other educational professionals is “to improve the capabilities of education professionals who aim to contribute to the continued improvement of teaching and learning in the classrooms, delivery of student services, and management of educational program” (CHED, 2007). Hence, CHED requires all HEIs to conduct a tracer study and is equally reflected as one of the required documents by any higher education accrediting body such as the Accrediting Agency of Chartered Colleges and Universities in the Philippines (AACUP), Inc. [6]. With the steady increase in the number of College graduates, employment opportunities for students have become very competitive [2]. The goals of the department are to strengthen the competencies of the graduates aligned with the mission, vision, goals and objective of Bukidnon State University to be able for our graduates to compete in the highly urbanized places and bridging the gap between industry and academe. The University graduate tracer study provides the desirable information as to what is happening to our new graduates when they join the world of work. It is equally important to find out how adequate is the training provided by our institution in the overall performance of their career life, the extent by which the knowledge, communication and other skills have been developed. This tracer study is also a way

which can provide valuable information for evaluating the results of education and training of an institution and thereby serve as a basis for future planning activities [2].

1.2 Objective of the Study

The study aimed to keep track of the undergraduate programs of the Bukidnon State University Automotive Technology Program and determined the employability and performance of graduates from batch 2019-2023.

Specifically, the study sought to find answers to the following research questions:

1. What is the performance of graduates in term of Licensure and Government Exam such as;
 - a. Board Exam
 - b. Civil Service Exam
 - c. National Certificate
2. What is the status of the graduates in terms of;
 - a. Entrepreneurial achievement,
 - b. Nature of work,
 - c. Employment status (national, international),
 - d. Rank and positions, and
 - e. Awards and Recognition
3. What is feedback of the employers of the BukSU’s Automotive Graduates?

1.3 Framework of the Study

Research conceptualization is important for several reasons, such as: it helps to ensure that the research is focused on the field and gives direction throughout the entire duration of the study; and it also helps to come up with a clear research plan and methodology. According to [11], conceptualization will assist researchers in overcoming key difficulties that have been recognized in grounding, situating, diagnosing, and resolving a research problem.

Figure 1 shows the conceptual framework of the study; the study has dependent and independent variables. The dependent variables are: graduate’s national certificate, status of graduates, and employers’ feedback. On the other hand, the independent variable is performance of graduates. The researchers want to determine if the independent variable has a direct influence on the dependent variable.

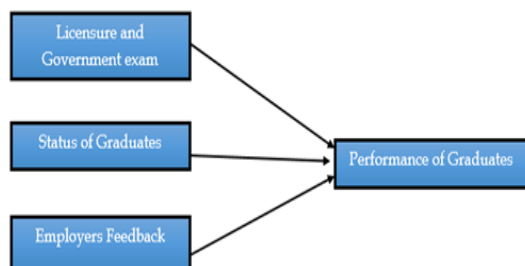


Figure 1: Conceptual Framework of the Study

2. Methodology

This chapter presents the research design and methods to be used in the study. It also describes the research design, research setting, research respondents, research instruments, sampling procedure, data-gathering procedure, and statistical treatment of data

2.1 Research Design

The study employed a mixed-method research design. It uses philosophical presumptions in which it gathers and analyzes data from multiple sources in a single study [7].

According to [8], mixed methods research integrates qualitative and quantitative research components, yielding more comprehensive findings compared to either approach used alone. Specifically, this study followed the exploratory sequential design type of mixed methodology. This method begins with the analysis of quantitative data collected and then follows up with qualitative data collection and analysis, which leads to interpretation.

This helps determine what quantitative results need further explanation. It is, in part, a curricular program evaluation if the graduates had effectively achieved the goal of their respective degree programs.

Moreover, policy implications and recommendations identified were necessary for the curricular improvement in the university [9].

2.2 Respondents

The respondents of the were the graduates of Bachelor of Science in Automotive Technology for year 2019-2023. Table 1 showed the distribution of graduates and respondents and the corresponding response rate [10].

Table 1: Research Respondents and Response Rate

Year	No. of Graduated	No. of Respondents	Response rate
2019	75	32	42.67 %
2020	55	20	36.36 %
2021	10	9	90.00 %
2022	44	42	95.45 %
2023	42	37	88.10 %
Total	226	140	61.95 %

2.3 Research Instrument

The research instrument was adopted from the University Alumni Relations Unit Graduate Tracer Study (GTS) instrument. While the other one will be developed by the researcher. After the revision of the questionnaire based on the feedback from the experts, the survey questionnaire was disseminated online through Google Forms.

2.4 Data Gathering Procedure

Upon the approval of the proposal, the data were collected following these phases;

Phase 1: Upon survey, the service manager/ direct supervisor of the graduates was requested to fill out a consent form that allows the technicians to participate in the research study. A written letter of consent was given to all participant informing them of the study's task, scope, and importance and requesting them to participate in the research thoroughly. Moreover, the researcher also adheres the data privacy act of 2012, by protecting the fundamental human right of privacy, of communication while ensuring free flow of information to protect the identity of the respondents.

Phase 2: The researcher collected the completed consent letter request and the respondents to answer the given questionnaire. The survey was done in 2 methods, physical and virtual; during the physical, the researcher will personally approach the respondents. Due to the location the other

method will be done online, the researcher will disseminate the google forms to the respondent.

Phase 3: The researcher collected the questionnaire and the evaluation result answers, checked them, tabulated, and recorded them

2.5 Data Analysis

The quantitative data gathered from the questionnaire were subjected to statistical analysis. To analyze the data, descriptive statistics such as frequency and percentages will be utilized. To further understand the data the researcher, use pie graph to represent the percentage distribution of the responses.

2.6 Ethics Statement

To protect the rights of participants, researchers made sure that participation in the study was voluntary and that all responses and information would be kept confidential and used only for research purposes. They also assured participants that their names, other identifying information, and sensitive details would not be disclosed. All procedures performed in the study involving human participants were following the ethical standards of the institutional and national research committee and with the Philippine Health Research and Ethics Board regulations. Informed consent is also obtained from all individual participants involved in the study.

3. Result and Discussion

This chapter presents results from the data gathered and interpreted after performing a survey process. The data were collected and then processed in response to the objective posed in chapter 1 of this research.

What is the performance of graduates in term of Licensure and Government Exam

The frequency distribution data in table 2 provides insight into the participants' engagement with licensure and government exams. Among the respondents, only 0.7% (1 participant) passed the board exam, and 1.4% (2 participants) passed the civil service exam, indicating very low participation in these traditional licensure exams. However, a significant portion, 34.3% (48 participants), have acquired national certificates, suggesting a preference for vocational and technical qualifications over traditional licensure exams.

Table 2: Frequency distribution of participant's Licensure and Government Exam

Licensure and Government Exam	f	%
No. of respondents Passed Board Exam	1	0.7%
No. of respondents Passed Civil Service Exam	2	1.4%
No. of respondents acquired National Certificates	48	34.3%
Did not take any Licensure and Government Exam	89	63.6%
Total no. of traced	140	100%

The data also reveals that the majority, 63.6% (89 participants), have not taken any licensure or government exams. This implies that most respondents either do not see the need, lack the opportunity, or are possibly not interested in obtaining such certifications. To address these trends, it is important to further investigate the barriers preventing the majority from taking these exams, which could include factors like lack of access, financial constraints, or perceived irrelevance to their career goals.

What is the status of the graduates in terms of Entrepreneurial achievement, Nature of work, Employment status (national, international), Rank and positions, and Awards and recognition

Entrepreneurial achievement

The data table display the Frequency distribution of the graduate's entrepreneurial achievement. Based on the table, the study traced 140 individuals to determine their entrepreneurial achievements. As presented in Table 3, the vast majority (97.14%) were employees, whereas a small minority (2.86%) were classified as entrepreneurs, businessmen, or owners.

Table 3: Frequency distribution of the graduate's entrepreneurial achievement

Entrepreneurial achievement	f	%
Entrepreneur/ Businessman / owner	4	2.86%
Employee	136	97.14%
Total no. of Traced	140	100%

This finding suggests that there may be barriers to entrepreneurship within this graduate. These barriers could include lack of access to capital, insufficient entrepreneurial education or training, or economic conditions that favor employment over self-employment. For instance, [12] highlight financial constraints as a primary obstacle, particularly for those without an established credit history or collateral. Similarly, [13] point out that many educational institutions do not provide comprehensive entrepreneurship programs, leaving graduates ill-equipped to start their ventures. Policymakers and educators might consider these factors when designing programs aimed at fostering entrepreneurial growth. Efforts to reduce these barriers could help increase the number of individuals pursuing entrepreneurial activities, potentially leading to greater economic diversity.

Nature of Work

A frequency distribution analysis was conducted to examine the nature of work among graduates (see Table 4). The majority of graduates (81%) are employed as Automotive/Service Technicians/Mechanics. Smaller percentages are working as Drivers/Operators (4%), Uniform Personnel (3%), Salesmen (7%), and Educators/Instructors (6%). The total number of graduates traced in this study was 140.

Table 4: Frequency distribution of the graduate’s nature of work

Nature of Work	<i>f</i>	%
Automotive/ Service Technician/ Mechanic	113	81%
Driver/ operator	5	4%
Uniform personnel	4	3%
Salesman	10	7%
Educator/ Instructor	8	6%
Total no. of Traced	140	100%

The data indicates that a significant proportion of graduates (81%) are employed in the automotive service sector as technicians and mechanics. This suggests a strong alignment between the training provided by the educational institution and the employment market demands within the automotive industry. This is consistent with findings from the Bureau of Labor Statistics (2021),

which reported that the automotive service industry has been one of the more resilient sectors in terms of job availability and growth, even amidst economic fluctuations. Educational programs might consider maintaining or even enhancing their focus on automotive-related training to continue supporting graduate employability in this dominant field. Additionally, there could be an opportunity to explore why other fields, such as uniform personnel and drivers/operators, have lower employment rates and whether adjustments in training programs could address any gaps in these areas.

Employment Status

Table 5 presents the frequency distribution of the employment status of the graduates. Out of the 140 graduates tracked, 103 (74%) are employed in regular positions, making it the most common employment status among the graduates. Temporary employment accounts for 25 graduates (18%), while 8 graduates (6%) are employed on a contractual basis. The least common employment status is self-employment, with only 4 graduates (3%) falling into this category.

Table 5: Frequency distribution of the graduate’s Employment Status

Employment Status	<i>f</i>	%
Regular	103	74%
Temporary	25	18%
Contractual	8	6%
Self- employed	4	3%
Total no. of Traced	140	100%

The data suggests that a significant majority of the graduates (74%) have achieved stable employment, as evidenced by their regular employment status. This high percentage indicates a positive outcome for the graduates in terms of job security. However, there is still a noteworthy proportion of graduates in less stable employment conditions, with 18% in temporary roles and 6% in contractual positions. This highlights the need for further support and opportunities for graduates to transition from temporary and contractual jobs to more stable, regular employment. Additionally, the low percentage of self-employed graduates (3%) might suggest either a lack of entrepreneurial interest or opportunities among this, warranting

further investigation into how to encourage and support self-employment as a viable career path.

Place of Work

The frequency distribution of the graduates' place of work is presented in Table 5. Out of the 140 graduates traced, 136 (97.14%) are employed nationally, while only 4 (2.86%) are working abroad. This distribution highlights a significant trend of graduates pursuing opportunities outside the country.

Table 6: Frequency distribution of the graduate's

Place of Work		
Place of Work	<i>f</i>	%
National	136	97.14%
Abroad	4	2.86%
Total no. of Traced	140	100%

The data suggest that graduates predominantly find employment within their home country, which could imply several potential factors. These might include a strong local job market, preferences for staying close to home, or perhaps fewer lack of financial to work abroad. This trend can be beneficial for national economic growth as it ensures that educated individuals are contributing to the local economy. However, it may also indicate a potential need to explore and possibly enhance international job placement support and opportunities for graduates who are interested in working abroad. Further investigation into the reasons behind these employment patterns could provide deeper insights and help inform educational institutions and policymakers about the needs and preferences of graduates in the labor market.

Rank and Position

Table 6 presents the frequency distribution of the graduate's rank and position. Among the 140 traced graduates, the majority (96%) hold technical positions, while a small minority are in managerial (3%) and supervisory (1%) roles.

Table 7: Frequency distribution of the graduate's

Rank and Position		
Rank and Position	<i>f</i>	%
Manager	3	3%
Supervisory	2	1%
Technical	135	96%
Total no. of Traced	140	100%

The data suggest that the graduate program predominantly produces individuals suited for technical roles. This might imply a strong technical focus in the curriculum, possibly at the expense of preparing graduates for leadership positions. Educational institutions may consider revising their programs to offer more leadership training and managerial skills to better prepare graduates for a wider range of positions, including supervisory and managerial roles.

Awards and Recognition

The data provided outlines the frequency distribution of awards and recognition received by graduates in their workplace. Out of 140 respondents, only 17 graduates (12%) have received awards and recognition, while a significant majority of 123 graduates (88%) have not been recognized in their workplace. This indicates that a substantial number of graduates are not being acknowledged for their contributions.

Table 8: Frequency distribution of the graduate's

Awards and Recognition received		
Awards and Recognition receive	<i>f</i>	%
No. of respondents received awards and recognition in their workplace	17	12%
Did not receive any awards and recognition	123	88%
Total no. of traced	140	100%

The implication of this data could suggest several scenarios. It might reflect a workplace environment where achievements are not regularly celebrated or a culture lacking in frequent recognition. It could also indicate that only a minority of graduates are performing at a level that warrants formal recognition, highlighting a potential need for enhanced performance or development programs.

What is feedback of the employers of the BukSU's Automotive Graduates

The thematic analysis of the interview data revealed the automotive graduate's employer answering the question "How is the performance of Bachelor of Science in Automotive technology in your company? The detail below was discussed with supporting quotations from the participants.

At their company, the priority is hiring well-trained and highly capable individuals to ensure the best performance in operations. Over the years, they have built strong relationships with educational institutions to tap into a pool of fresh talent that can drive their business forward. In this context, they have observed that graduates from Bukidnon State University consistently meet and exceed their expectations, providing them with a robust workforce that is well-prepared for the demands of the automotive industry. For instance, aftersales supervisor of subaru motors stated:

"We've had positive experiences with BS Automotive graduates from Bukidnon State University. Their knowledge is well-applied in the workplace, especially in areas like automotive maintenance, diagnostics, and repair. Their hands-on training at the university has equipped them with practical skills that are valuable to our operations. Overall, we've found BS Automotive graduates to be diligent, responsible, and eager to learn. They exhibit a strong work ethic, attention to detail, and a willingness to take on challenges. Their positive attitude contributes to a positive work environment and fosters teamwork"

Further, Technical Supervisor at Mitsubishi Motors Cagayan de Oro City highlight that the graduates have a huge contribution in their company.

"The automotive graduate of Bukidnon State University's performance has a significant impact on our workflow. With their expertise and efficiency, they help ensure that tasks are completed accurately and on time. Their contributions contribute to overall productivity and the smooth operation of our automotive services. Overall, we're pleased with the performance of BS Automotive graduates from Bukidnon State University and value their contributions to our team."

Another employer commends the performance of the graduates as they stated:

"We've had consistently positive experiences with BS Automotive graduates from Bukidnon State University. Their knowledge is effectively applied in the workplace, particularly in areas such as automotive maintenance, diagnostics, and repair. The hands-on training, they receive at the university has equipped them with practical skills that are invaluable to our operations. Overall,

we've found BS Automotive graduates to be diligent, responsible, and eager to learn. They exhibit a strong work ethic, meticulous attention to detail, and a readiness to tackle challenges. Their positive attitude not only contributes to a constructive work environment but also fosters a spirit of teamwork and collaboration."

The emphasis on practical skills, responsibility, and eagerness to learn indicates that BukSU graduates are not only technically proficient but also exhibit the soft skills necessary for effective teamwork and continuous improvement. Employers often report that hiring well-trained graduates brings numerous benefits to their organizations. A study by [14] indicates that graduates who are well-prepared academically and practically are more likely to contribute positively to their workplaces. These graduates bring updated knowledge, innovative ideas, and a readiness to engage with new technologies and methodologies, which can lead to improved productivity and organizational performance [14]. The statement provided highlights the value of hiring graduates from Bukidnon State University's BS Automotive program, emphasizing their practical skills and positive impact on the automotive industry. This sentiment is supported by the university's strong performance in external assessments, such as achieving a 100% passing rate in National Certificate exams for automotive servicing for 5 consecutive years under the Technical Education and Skills Development Authority (TESDA). Additionally, the BS Automotive Technology program is recognized as AACCUP Level III accredited, indicating a high standard of education that aligns with industry needs. Practical skills are particularly crucial in technical fields like automotive technology. [15] emphasize that hands-on experience and practical training significantly enhance a graduate's ability to perform job-specific tasks proficiently. These accomplishments validate the good experiences employers in the field have to offer and show the university's dedication to offering high-quality education that gives students the tools they need for their professional careers. Employers place a great importance on soft skills like accountability, teamwork, and communication in addition to technical proficiency. Soft skills are essential for

enabling workers to function well in teams, adjust to changing surroundings, and support a positive workplace culture, according to [16]. Thus, the fact that automakers have been successful in using the talents of Bukidnon State University graduates shows the great benefits of giving highly competent, well-trained people priority. By maintaining strong relationships with educational institutions like BukSU, companies can ensure a steady stream of skilled talent that drives performance, innovation, and operational excellence. This approach not only benefits the companies but also contributes to the professional growth and career success of the graduates, creating a mutually beneficial ecosystem. Accreditation and external assessments serve as benchmarks for educational quality.

4. Conclusion

Based on the results, the BukSU Automotive Technology graduates indicate a strong alignment between the educational curriculum and the demands of the automotive industry. This alignment is crucial for the employability of graduates, as emphasized by [17], who highlights the importance of curriculum design in equipping students with relevant skills for the labor market. Specifically, in the field of automotive technology, institutions like BukSU play a vital role in preparing students for technical roles within the industry. Graduates predominantly secure technical roles within the national job market, reflecting the institution's effective training programs due to the fact that the program develops innovative instructional trainer model that help and improve the technical skills of the graduates [18]. This innovation also helps the learners to upgrade their knowledge and skills to adopt the modern technology of the vehicle, it also addressed the need for new technology training equipment in the automotive industry [19]

This observation is consistent with the findings of [20], who noted that educational programs closely aligned with industry standards produce graduates who are readily employable and possess the necessary skills to excel in their roles. However, there is a notable lack of entrepreneurship among graduates, suggesting potential barriers to starting businesses. This aligns with Nabi and [21], who

identified several barriers to entrepreneurship among graduates, including limited access to capital, inadequate entrepreneurial training, and a lack of support systems. Enhancing entrepreneurial education within the curriculum could address these barriers and foster a culture of innovation and business creation. While most graduates enjoy stable employment, there is room for improvement in transitioning graduates from temporary and contractual roles to regular employment. Research by [22] suggests that while vocational graduates are highly employable, there is a need for policies that support the transition to stable employment.

Employer feedback underscores the practical competence and positive work attitudes of BukSU graduates, contributing to their high employability and performance in the workplace. According to [23], employers value graduates who demonstrate not only technical skills but also soft skills such as teamwork, communication, and problem-solving abilities. The positive feedback from employers regarding BukSU graduates is a testament to the institution's effective training programs and its focus on holistic student development. The strong alignment between BukSU's Automotive Technology curriculum and the demands of the automotive industry ensures that graduates are well-prepared for technical roles as well as the innovative instructional materials to facilitate their learning of the automotive course [24]. However, addressing the barriers to entrepreneurship and improving the transition to regular employment can further enhance the career prospects of graduates. Continuous feedback from employers and adjustments to the curriculum will be essential in maintaining the high employability and performance of BukSU graduates in the evolving job market.

References

- [1] Harvey, L. (2001). Defining and measuring employability. *Quality in Higher Education*, 7(2), 97-109.
- [2] Ramirez, T. L., Cruz, L. T., & Alcantara, N. V. (2014). TRACER STUDY OF RTU GRADUATES: AN ANALYSIS. *Researchers World - Journal of Arts Science and Commerce/Researchers World: Journal of Arts, Science and*

- Commerce, 5(1), 66–76.
<http://researchersworld.com/index.php/rworld/article/view/757>
- [3] York, T. T., Gibson, C., & Rankin, S. (2015). Defining and Measuring Academic Success. *ResearchGate*, 20(5), 1–20.
<https://doi.org/10.7275/hz5x-tx03>
- [4] Schomburg, H. (2003). Handbook of tracer studies. Retrieved from http://www.uni.kessel.de/wz/proj/edwerk/mat/handbook_vz.doc
- [5] Millington, C. (2001). The use of tracer study for enhancing relevance and marketability in online and distance education. Retrieved July 30, 2013, from http://wikieducator.org/images/e/e1/PID_4_24_pdf
- [6] Gines, A. C. (2014). Tracer Study of PNU Graduates. *American International Journal of Contemporary Research*.
http://www.aijcrnet.com/journals/Vol_4_No_3_March_2014/10.pdf
- [7] Dawadi, S., Shrestha, S., & Giri, R. A. (2021). Mixed-Methods Research: A Discussion on its Types, Challenges, and Criticisms. *Journal of Practical Studies in Education*, 2(2), 25-36
DOI: <https://doi.org/10.46809/jpse.v2i2.20>
- [8] Shorten A, & Smith J (2017) Mixed methods research: expanding the evidence base *Evidence-Based Nursing* 2017;20:74-75.
- [9] Cuadra, L. J., Aure, M. R. K. L., & Gonzaga, G. L. (2019). The use of Tracer study in improving undergraduate programs in the university. *Asia Pacific Higher Education Research Journal (APHERJ)*, 6(1).
<https://po.pnuresearchportal.org/ejournal/index.php/apherj/article/download/1315/409>
- [10] Rojas, T. T., & Rojas, R. C. (2016). College of Education Graduate Tracer Study (GTS): Boon or bane? *European Scientific Journal*, 12(16), 63.
<https://doi.org/10.19044/esj.2016.v12n16p63>
- [11] Maedche, A., Gregor, S., Morana, S., & Feine, J. (2019). Conceptualization of the problem space in Design Science Research. In *Lecture notes in computer science* (pp. 18–31).
https://doi.org/10.1007/978-3-030-19504-5_2
- [12] Robb, A. M., & Robinson, D. T. (2012). The capital structure decisions of new firms. *Review of Financial Studies/the Review of Financial Studies*, 27(1), 153–179.
<https://doi.org/10.1093/rfs/hhs072>
- [13] Fayolle, A., & Gailly, B. (2015). The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence. *Journal of Small Business Management*, 53(1), 75–93.
<https://doi.org/10.1111/jsbm.12065>
- [14] Finch, D. J., Hamilton, L. K., Baldwin, R., & Zehner, M. (2013). An exploratory study of factors affecting undergraduate employability. *Education + Training*, 55(7), 681-704.
- [15] Martin, A., Kolomitro, K., & Lam, T. (2014). Training Methods: A Review and Analysis. *Human Resource Development Review*, 13(1), 11-35.
- [16] Robles, M. M. (2012). Executive perceptions of the top 10 soft skills needed in today's workplace. *Business Communication Quarterly*, 75(4), 453-465.
- [17] Jackson, D. (2014). Factors influencing job attainment in recent Bachelor graduates: Evidence from Australia. *Higher Education*, 68(1), 135-153.
- [18] Naelga & Chavez, R. M. (2017). An instructional innovation for lighting, car alarm and central locking system. *Published journal of engineering and applied science*
- [19] Chavez, R. M. (2023). DESIGN AND DEVELOPMENT OF AUTOTRONICS SIMULATION MODEL FOR CAR LIGHTING SYSTEM. *Sci. Int.(Lahore)*, 35(4), 435-439.
- [20] Tran, T. T. (2018). Enhancing graduate employability: The perspectives of Vietnamese university students and graduates. *Journal of Education and Work*, 31(2), 127-140.
- [21] Nabi, G., & Liñán, F. (2013). Considering business start-up in recession time: The role of risk perception and economic context in shaping the entrepreneurial intent. *International Journal of Entrepreneurial Behavior & Research*, 19(6), 633-655.

- [22] Ismail, R., Abdul Kadir, A. R., & Rasdi, R. M. (2020). Vocational education and training and graduates' employability: The case of Malaysia. *Journal of Technical Education and Training*, 12(1), 56-65.
- [23] Zaharim, A., Yusoff, Y. M., Omar, M. Z., Mohamed, A., & Muhamad, N. (2012). Engineering employability skills required by employers in Asia. *Procedia - Social and Behavioral Sciences*, 8(1), 21-30
- [24] Chavez, R. M (2022). Instructional Automotive Charging System with Automatic Voltage Regulator and Integrated Circuits. *International Journal of Engineering and Advanced Technology*, 12.