

BRIDGING HIGHER EDUCATION AND WORKFORCE DEMANDS: EVALUATING THE PROFESSIONAL REQUIREMENTS FOR MASTER'S GRADUATES IN EARLY CHILDHOOD EDUCATION

IKA BUDI MARYATUN, JOKO PAMUNGKAS, AMIR SYAMSUDIN & NUR
HAYATI

Department of Early Childhood Education, Education Faculty, Universitas Negeri Yogyakarta, Yogyakarta,
Indonesia

Corresponding author: Ika Budi Maryatun
Orchid ID: <https://orcid.org/0000-0002-3592-4575>

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ABSTRACT

This study aims to evaluate labor market needs for graduates of the Early Childhood Education (ECE) Master's Program at UNY. A mixed-method design was applied, integrating a descriptive quantitative survey with qualitative expert Focus Group Discussions. Participants included employers of ECE master's graduates and members of the Indonesian Early Childhood Education Association (APG). Data were obtained through interviews, questionnaires, and documentation, and analyzed using quantitative and qualitative techniques. The results show that the ECE Master's Program has formally established Learning Outcomes (LO) and Graduate Competency Standards (CPL), focusing on strengthening graduates' mastery of theoretical foundations to support scientific and technological development through research and innovation in early childhood education. Quantitative findings reveal that 80% of graduates are employed within six months, with an average salary of IDR 2,172,647. Alumni expressed high satisfaction with academic services and learning facilities, rated very good by 56% and 49% of respondents, respectively. Teaching and learning activities were also considered highly effective (53%), dominated by lectures and project-based learning. However, employers highlighted the need to improve foreign language skills, particularly English, which received the lowest evaluation score. These findings offer important insights for enhancing the relevance and quality of graduate competencies to better meet workforce expectations.

Keywords: ECE master's graduates, workforce needs, curriculum evaluation

1.0 INTRODUCTION

Public concern regarding the urgency of providing high-quality educational services has continued to increase, thereby driving the need for professional human resources in the Early Childhood Education (ECE) sector. Educator professionalism is determined not only by mastery of theoretical knowledge but also by practical competencies relevant to the dynamics of educational implementation in the field (NAEYC, 2020; Palupi, 2025). Accordingly, ECE master's programs are expected to cultivate graduate profiles that are responsive to career demands across a variety of institutions providing early childhood services (Pearson & Siraj, 2025; Thi & Ha, 2025), enabling teacher education institutions to optimize their role in producing highly skilled and competent experts. Numerous studies reveal that the quality of

ECE educators in developing countries, including Indonesia, continues to face significant challenges related to limited professional training and the lack of systems that support ongoing competency enhancement (Kim et al., 2024). Furthermore, empirical findings highlight a misalignment between higher education curriculum design and the competencies prioritized by the ECE workforce, which affects the relevance of graduates upon entering the job market.

Despite efforts to refine curricula, a substantial competency gap remains between the abilities of ECE master's graduates and the expectations of stakeholders in the ECE sector, including service providers, partner organizations, and program managers (Corral-Granados et al., 2024). Academic reports emphasize that graduates still require strengthening in areas such as the implementation of learning assessments, the management of educational services, and the development of meaningful and participatory learning interactions (Karaoulas, 2025; Laksono et al., 2023). This phenomenon has sparked critical discourse on the capacity of higher education institutions to provide learning experiences that ensure comprehensive graduate readiness, particularly in the ECE context, which demands a blend of pedagogical and managerial competencies, and also digital competencies (Otundo, 2025; Wiltshire, 2024).

Competition in the professional ECE labor market continues to intensify, requiring graduates of ECE master's programs to assume broader and more complex roles. Graduate qualifications are no longer limited to teaching skills but increasingly encompass capacities as curriculum developers, educational leaders, practitioner-researchers, and innovators capable of responding to emerging challenges in ECE services. The ECCE Teacher Competency Framework developed by UNESCO (2018) (Rismayanti et al., 2025) for the Southeast Asian region underscores that early childhood educators must possess holistic competencies spanning knowledge, skills, and dispositions to ensure optimal child development (Wiltshire, 2024). However, research reports indicate that ECE master's graduates in Indonesia still require strengthening in strategic competencies such as educational leadership, innovation, and community partnerships, and thus have not yet fully met international professional standards (Wicaksono et al., 2023). Such competency gaps may reduce the efficiency of ECE services and hinder graduates' contributions to improving national education quality.

In addition, the ECE professional landscape continues to transform. The workforce increasingly demands educators who are not only pedagogically skilled but also capable of developing adaptive curricula, integrating educational technologies, implementing performance-based institutional management, and conducting service evaluations grounded in research to ensure sustainable quality (Arif & Mir, 2023; Valle-Flórez et al., 2024). Amid these developments, higher education institutions have not fully succeeded in aligning their curricula and student learning experiences with the evolving needs of the ECE industry, resulting in some graduates encountering obstacles in meeting the expectations of stakeholders such as government bodies, service providers, and communities (Halimah et al., 2022; Hyseni Duraku et al., 2022).

Therefore, mapping workforce needs against the competencies of ECE master's graduates is a strategic step to ensure alignment among graduate profiles, learning outcomes, and the actual demands of the labor market (Halimah et al., 2022). Such evaluation not only highlights areas in need of improvement but also provides an evidence-based foundation for policy decisions concerning which curriculum components should be maintained, enhanced, or reconstructed.

These efforts are expected to strengthen the relevance of ECE master's programs in the context of global competition and ensure the quality of graduates capable of contributing to the development of ECE services at both national and international levels.

2.0 RESEARCH METHOD

2.1 Research Approach

The study examining the alignment between the competencies of Early Childhood Education (ECE) master's graduates and labor market needs was designed to generate objective and measurable information regarding the actual demands of stakeholders for professionally qualified ECE personnel at the master's level. Therefore, this research employed a descriptive quantitative approach through a survey to broadly map user perceptions of graduates and identify numerical trends within the data. In addition, to obtain strategic recommendations concerning the direction of graduate profile development, whether it should be maintained, enhanced, adjusted, or reconstructed, a qualitative approach was incorporated through in-depth interviews with experts and practitioners affiliated with the Indonesian ECE Association.

This mixed-methods approach aligns with Creswell and Plano Clark (Creswell, 2012), who assert that integrating quantitative and qualitative data can enhance the accuracy of decision-making in educational research. All analyses of graduate competencies refer to the CIPP evaluation framework developed by Stufflebeam, which includes the dimensions of context, input, process, and product, to assess the effectiveness of the study program comprehensively from upstream to downstream (Stufflebeam, 2003).

2.2 Evaluation Model

The implementation of a tracer study for graduates of the Master's Program in Early Childhood Education (ECE) requires a methodological approach capable of capturing the various dimensions of graduate relevance comprehensively. Therefore, this study employs a program evaluation design oriented toward assessing the effectiveness of higher education delivery. The evaluative framework adopted refers to the CIPP Model (Context, Input, Process, Product), which is widely recognized as one of the most comprehensive evaluation models for assessing needs and program quality in education.

Through context analysis, this study identifies the demands and emerging trends in the need for professional personnel in the ECE sector. In the input dimension, the focus is directed toward examining the readiness of supporting resources, including students' initial competencies and the curriculum implemented. The process evaluation reviews the implementation of learning activities in generating relevant academic and practical experiences. Meanwhile, the product dimension is assessed through graduates' performance in the workforce as an indicator of learning outcomes.

This systematic approach enables researchers to obtain a holistic understanding of the extent to which the competencies of graduates of the ECE Master's Program align with current professional requirements in the field.

2.3 Research Methods and Participants

The integration of quantitative and qualitative methods in a tracer study is considered essential for generating findings that are both empirically robust and contextually rich. On the quantitative side, survey questionnaires were distributed to graduates of the ECE Master’s Program who have entered the professional field, as well as to users of the graduates, including early childhood education institutions and other related organizations. This approach enables the collection of large-scale and standardized data on the extent to which graduates’ competencies meet the demands of professional practice. Statistical analyses of these findings provide a mapping of patterns, competency trends, and curriculum areas that require further strengthening.

Meanwhile, the qualitative approach was employed to uncover aspects that cannot be reduced to numerical data. Through in-depth interviews with experts, employers, academics, and alumni, the researchers were able to capture narratives that explain the underlying causes of gaps between learning outcomes and labor market expectations. This approach also allows researchers to understand the dynamics of stakeholder perceptions regarding relevance, challenges in competency implementation, and opportunities for graduates’ professional development.

By combining these two approaches, the tracer study not only answers what is happening based on quantitative data but also explains why and how these conditions occur based on qualitative insights. This is in line with Creswell and Plano Clark’s (Creswell, 2012) assertion that the use of mixed methods enhances validity, complements interpretation, and provides a more meaningful basis for recommendations in educational research.

2.4 Data Collection Techniques

To obtain a representative understanding of workforce needs, this tracer study involved multiple data sources directly related to the competencies of graduates from the ECE Master’s Program, including alumni from various institutions and graduation cohorts, external stakeholders such as early childhood education centers and policymakers, as well as educators and academic program administrators. The involvement of multiple informants is a key strategy for assessing the application of graduate competencies in the field while simultaneously evaluating the contributions of the curriculum and learning processes in preparing professional ECE personnel. By employing an approach that prioritizes triangulation and reliability of perspectives, the findings are expected to provide an accurate mapping of competency needs and offer a basis for developing an ECE master’s program that is more aligned with the demands of early childhood education practice.

Data were collected using the following techniques and instruments:

Table of Research Instruments

Stage	Technique	Instrument	Data Focus
Quantitative	Survey	Closed-ended Likert-scale questionnaire	Users’ perceptions of graduates’ competencies

Stage	Technique	Instrument	Data Focus
Qualitative	Focus Group Discussion (FGD)	Open-ended interview guide	Expert perspectives on competency gaps and field needs

2.5 Data Analysis

Data analysis in this tracer study was conducted using a gap analysis approach to identify discrepancies between the competencies acquired by graduates of the ECE Master’s Program and the competencies required in the workforce. This approach not only presents the level of alignment quantitatively but also reveals specific competency dimensions that require further strengthening, such as pedagogy, leadership, instructional innovation, and research skills. Respondents were selected representatively from various graduation cohorts and diverse workplace settings, enabling the findings to be generalized as an overview of professional ECE needs at both national and regional levels. Through this sampling strategy, the study’s findings are able to provide evidence-based recommendations for curriculum enhancement and program strengthening so that graduate preparation becomes more adaptive to the evolving demands of the ECE labor market.

Quantitative data analysis was conducted using descriptive statistics, including means, percentages, and qualification categories, which were presented in tables or graphs to map data trends. Meanwhile, qualitative data analysis employed thematic analysis through coding procedures, which included data reduction, thematic categorization, and the interpretation of meanings and relationships among themes. Source and methodological triangulation were also applied to enhance data credibility by incorporating survey techniques, interviews, and document analysis, as well as multiple data sources, including alumni, employers, and experts.

3.0 RESULTS AND DISCUSSION

This section presents the research findings on the profile and competency alignment of Master’s in Early Childhood Education (PAUD) graduates with labor market needs, which are subsequently interpreted through theoretical analysis and previous studies to inform policy implications and program development.

3.1 CONTEXT

3.1.1 Labor Market Demand for Master’s in Early Childhood Education Graduates

The absorption rate of graduates from the Master’s Program in Early Childhood Education (PAUD) in the workforce indicates that the competencies they possess are highly relevant to current professional demands. The tracer study data show that the majority of graduates from the Master’s Program in PAUD, Faculty of Education, UNY, have secured full-time employment, reaching approximately 81%, including 2% who are self-employed. Meanwhile, around 6% of graduates are still in the transition phase toward entering the workforce, and approximately 11% have chosen to pursue further studies. None of the graduates are unemployed, as illustrated below.

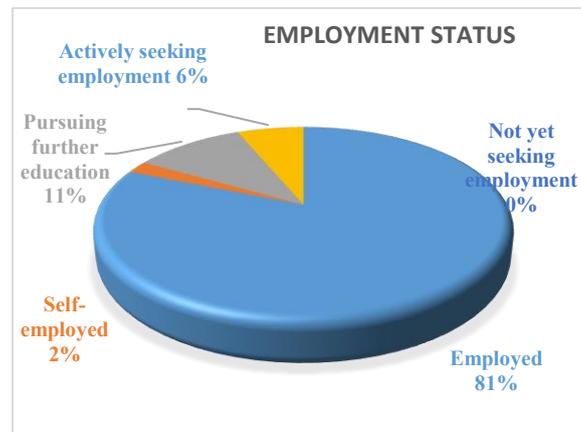


Figure of the employment status

These findings indicate a high demand for early childhood education professionals with postgraduate qualifications and demonstrate the significant contribution of the master’s program in preparing competent human resources for the ECED sector (OECD, 2021 in (Brief & Policy, 2022); UNESCO, 2022 in (Goal, 2022). Accordingly, the strong labor market demand for graduates of Master’s programs in Early Childhood Education serves as a crucial foundation for higher education institutions to continually strengthen curriculum relevance and the development of graduate competencies.

The job waiting period of graduates also indicates a high level of employability, with most alumni of the Early Childhood Education Master’s Program at FIP UNY securing employment within ≤ 6 months. These data further reinforce that the graduates possess competencies that are highly relevant to current professional demands, as an outcome of the Master’s Program in Early Childhood Education UNY, whose curriculum is designed with a labor-market orientation. This curriculum integrates field-based practical experience, soft-skill development, and collaboration with institutions that employ graduates, ensuring that graduates are well-prepared and responsive to the needs of early childhood education institutions (Cheng et al., 2025; Kim et al., 2024; Pearson & Siraj, 2025; Thi & Ha, 2025).



Figure of employment waiting periode ≤ 6 months

The data analysis shows that among the 45 graduates of the Early Childhood Education Master’s Program at the Faculty of Education, Yogyakarta State University, 36 individuals (80%) secured employment within a maximum of six months after graduation. Conversely,

only 9 respondents (20%) required more than six months before entering the workforce. These findings indicate a correlation between the job-seeking waiting period and the income level or salary received by the graduates.

3.2 INPUT

The input component in the evaluation of program quality encompasses all initial resources that contribute to the success of the educational process, including academic services and learning facilities as the foundation for determining the program's strategies and capacity to effectively achieve its learning objectives.

3.2.1 Academic Services

Within the dimension of academic services, attention is directed toward the quality of teaching processes, academic advising provided by lecturers, and administrative support delivered by educational staff and program administrators. Responsive and professional services are essential factors in ensuring academic quality and student success. Furthermore, the quality of academic services directly contributes to student satisfaction, which in turn influences learning motivation, academic engagement, and graduates' perceptions of the program's relevance and usefulness.

Therefore, students' perceptions of the academic services provided by the program serve as an important indicator within the evaluation process. The survey data related to this aspect are presented in the following diagram to provide an empirical overview of the quality of academic services experienced by students.

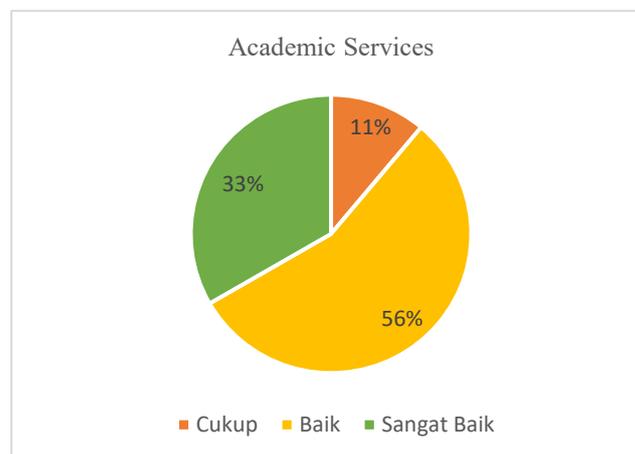


Figure of academic services

Alumni evaluations show that most respondents expressed positive appreciation for the academic services in the Master's Program in Early Childhood Education, with 56% rating them as good and 33% as excellent. Thus, more than two-thirds of the alumni reported satisfaction with the teaching, academic advising, and administrative support they received. However, 11% rated the services as fair, indicating the need for improvements in certain aspects such as service responsiveness, access to information, and other academic facilitation.

These findings align with previous studies demonstrating a strong relationship between the quality of academic services and student satisfaction, where the SERVQUAL dimensions (reliability, responsiveness, assurance, empathy, and tangibles) are commonly used to identify service gaps and improvement priorities (Fatmawati & Murfi, 2025). Moreover, the results reinforce that enhancing academic service quality, including administrative response time, accessibility of information, and IT-based academic support, directly contributes to student loyalty and learning outcomes. Therefore, improvements in these areas have a dual impact on both student satisfaction and institutional reputation (Bahadur et al., 2024).

From a quality assurance perspective, the finding that 11% of respondents provided a “fair” rating indicates the need for a systematic continuous quality improvement mechanism, such as periodic service audits, standardized service procedures across faculty and administrative staff, and the utilization of alumni feedback as a basis for intervention. This condition is consistent with international QA policies and guidelines that encourage the harmonization of academic service practices and the use of evaluative data for ongoing improvement (Yung et al., 2025).

3.3 PROCESS

The process component in program evaluation refers to the implementation of learning activities and the application of instructional methods throughout the course of study.

3.3.1 Learning Implementation

In examining the implementation of learning, the assessment focuses on alumni experiences during their coursework in the Master’s Program in Early Childhood Education. Findings related to alumni perceptions of the quality of learning implementation are presented in detail in the following section through survey-based data.

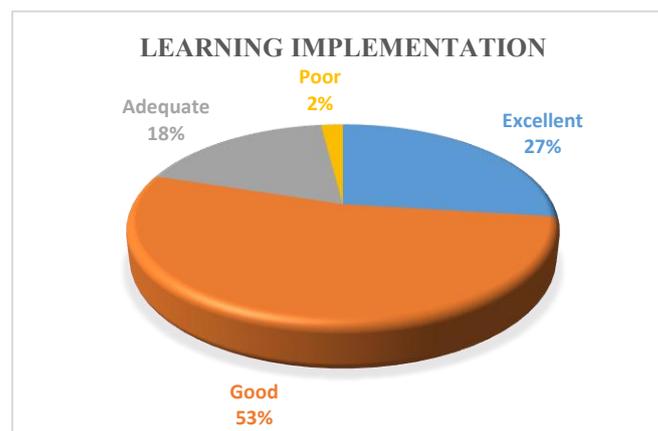


Figure of learning implementation

The alumni evaluation indicates that approximately 80% of respondents (53% good and 27% excellent) were satisfied with the implementation of learning in the Master’s Program in Early Childhood Education, suggesting that the teaching–learning process was effective, well-structured, and aligned with student needs. However, 18% rated it as fair and 2% as poor, indicating that certain aspects, such as instructional methods, variety of learning strategies, use

of technology, or field practice experiences, may not yet be fully optimized. Thus, although the overall quality of learning implementation can be categorized as satisfactory, continuous improvement efforts are still needed to enhance service quality so that future alumni assessments may shift toward the excellent category.

3.3.2 Instructional Methods

In the aspect of instructional methods, the implementation of the Master's Program in Early Childhood Education curriculum at FIP UNY is carried out through the use of diverse instructional approaches tailored to the characteristics of each course and the competency needs of the students.

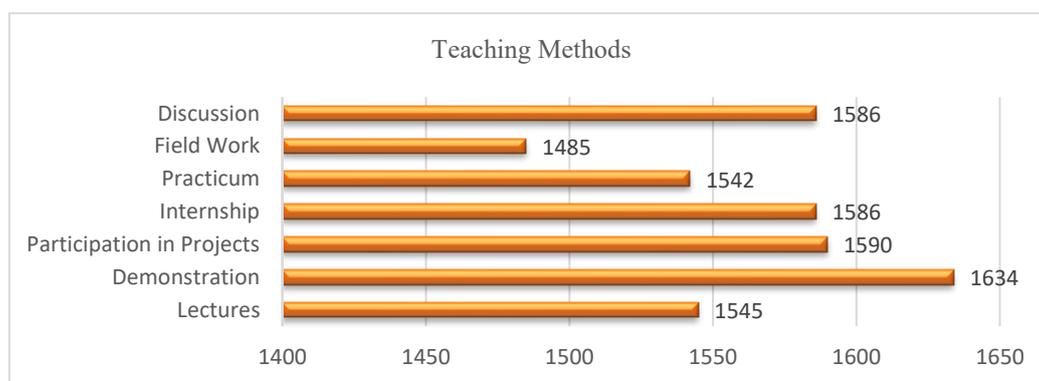


Figure of teaching methods

The research findings indicate that students experienced various forms of learning with a relatively balanced distribution. Demonstration emerged as the method with the highest score (14.90%), followed by project-based learning (14.52%) and internships (14.49%), underscoring the strong influence of hands-on learning experiences. Meanwhile, discussions (14.45%), lectures (14.07%), and practicums (14.05%) contributed almost equally as foundational approaches for strengthening theoretical understanding and academic interaction. Fieldwork received the lowest score (13.52%); however, the difference was not substantial compared to the other learning methods.

The research findings, which indicate a high level of student engagement in practical activities such as demonstrations, projects, and internships, reinforce the relevance of experience-based and flexible learning models such as blended learning, a modern approach that integrates face-to-face interaction with technology in response to the demands of education in the digital era. Meta-analyses in science education have shown that blended learning significantly enhances learning outcomes, engagement, motivation, and learner autonomy (Gupta, 2023; Munnawarah, 2025). Other quantitative studies at the higher-education level have likewise found that the implementation of blended learning improves the effectiveness of student learning, particularly in terms of material comprehension and active participation (Labibah, 2024). Accordingly, the present findings, revealing that practice-oriented methods received high scores while discussions, lectures, and laboratory work also contributed substantially, are consistent with contemporary literature emphasizing that the combination of authentic practice and academic interaction is highly effective. Furthermore, blended learning not only

strengthens cognitive aspects but also expands opportunities for students to manage their learning independently, a crucial element in the context of higher education.

3.4 PRODUCT

The product evaluated in this study refers to the level of user satisfaction with the graduates, assessed from the perspective of the competencies they possess.

3.4.1 Alumni and Graduate User Satisfaction

Through the responses of the users, it becomes evident how they evaluate alumni satisfaction and identify the competencies that serve as strengths as well as those that require further improvement among the graduates of the Early Childhood Education Master's Program, Faculty of Education, Yogyakarta State University, as presented below.

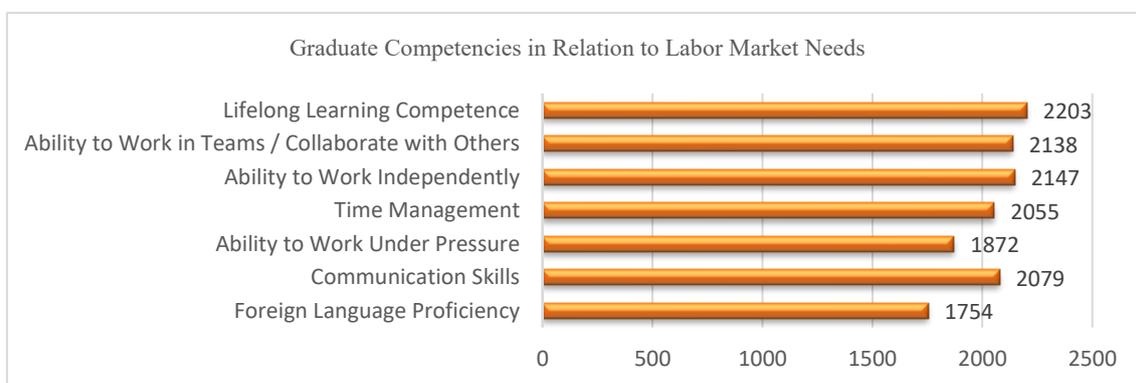


Figure of graduate competencies in relation to labor market needs

The histogram data indicate that graduates' ability to develop themselves, particularly their readiness for lifelong learning, is the competency most appreciated by users, whereas English proficiency and resilience under pressure are rated relatively low. These findings align with international studies emphasizing the critical role of English-language skills in enhancing employability and professional effectiveness. For instance, (Hiew et al., 2021) found that English proficiency constitutes part of the transversal skills required for graduates to adapt to modern workplace demands, while Maksan and Sukri (2025) demonstrated that non-language majors with stronger English competencies tend to be more competitive in recruitment processes and job performance. Additionally, a systematic review by (Khoiriyah et al., 2025) shows that English proficiency serves as a strategic asset that enhances collaboration and productivity within multinational work environments.

When linked to the CIPP evaluation model, graduates' weaknesses in foreign-language skills suggest that the process aspect of education, including learning strategies, assignments, and the integration of international literature, has not yet optimally supported the attainment of the expected global competencies as the final product. Therefore, the findings underscore the need for a more systematic strengthening of the learning process, such as integrating academic English training, increasing exposure to international literature, and designing assignments that require the use of English, so that the gap between educational outputs and the demands of the global labor market can be minimized.

4.0 CONCLUSIONS

The findings of this study reveal results across all components of the CIPP model. In the context aspect, it is evident that the demands of the labor market require graduates to possess global and adaptive competencies. In the input aspect, it is identified that learning support, including facilities and curriculum design, has provided experiences that strengthen disciplinary knowledge, yet remains limited in facilitating foreign-language proficiency and workplace resilience. In terms of process, the implementation of learning needs to integrate academic activities based on international literature, critical discussion, and simulations of workplace situations that require endurance and resilience. Meanwhile, in the product aspect, graduates are regarded as strong in their ability to develop themselves and engage in lifelong learning, but they continue to show weaknesses in English proficiency and in working under pressure.

4.1 Acknowledgments

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