Detecting and Preventing Plagiarism in Final Year Projects Report: The Role of The Electrical Engineering Department at POLIMAS

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Abstract: Plagiarism in final year projects poses a serious challenge in technical education, particularly in diploma-level Electrical Engineering (EE) courses. Faculty members play a crucial role in detecting and preventing plagiarism through structured academic policies, technological tools, and pedagogical approaches. This paper explores the methods used by POLIMAS's Electrical Engineering Department to ensure originality in final year project reports carried out by the final year students in three (3) programs: Diploma in Electrical Engineering (DET), Diploma in Electrical & Electronic Engineering (DEE), and Diploma in Electronic Engineering (Communication) (DEP). This paper discusses various common types of plagiarism among EE students, analyzes the effectiveness of plagiarism detection tools employed to assess plagiarism trends, as well as explores the challenges of enforcing academic integrity. Findings indicate that inadequate awareness, time constraints, and ease of access to online resources contribute to plagiarism. By utilizing detection software tools, variations in similarity percentages can be identified. For those exceeding the similarity threshold percentage, revisions are required. The challenges faced by the EE Department in enforcing academic integrity are that students use AI-based tools to generate seemingly original content, making detection difficult. Furthermore, most of the students are unaware of proper citation practices, as well as the lack of enforcement of plagiarism policies introduced against plagiarism. The study recommends enhancing the academic writing practice workshop to strengthen academic integrity in POLIMAS's EE Department. Additionally, institutional interventions should be implemented as a key factor in preventing plagiarism among EE students.

Keywords: *Plagiarism, Plagiarism Detection, Plagiarism Prevention, Project Report*

1.0 INTRODUCTION

The Electrical Engineering (EE) Department at the Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS) strives to deliver effective technical education and training for students specializing in electrical and electronic engineering. The department offers diploma programs comprising Diploma in Electrical Engineering (DET), Diploma in Electrical & Electronic Engineering (DEE) and Diploma in Electronic Engineering (Communication) (DEP). Upon completion of the diploma programs, the program of study will provide students with theoretical knowledge and practical hands-on skills for a variety of careers. In each diploma program for the Electrical Engineering (EE) department, the Final Year Project (FYP) is an integral part designed to assess students' abilities to apply their technical knowledge and problem-solving skills in real world engineering situations. The FYP is the final project that combines the theoretical concepts covered during the diploma program with practical hands-on experience.

Although 'plagiarism' is defined differently, in an academic, legal, or professional context, it is usually defined as the act of using a person's ideas, words, or work (or some

combination of these) without proper attribution (Adavala, 2023; Bhuyar & Deshmukh, 2023). Plagiarism often can detract from the learning experience, demean original research, and be a threat the acceptable quality of educational institutions. Ethically, plagiarism is a dishonest act and a violation of standards of professionalism and scholarship; professionally, it can harm reputations and leads to liability in the criminal sense; academically, it limits critical thought, originality, and proper knowledge. A specific concern within higher education, notably in technical areas like Electrical Engineering (EE), is the integrity of the research, reporting, and projects done by students. Plagiarism threatens academic integrity, but it also threatens the integrity of the reports.

Understanding the significance of innovation and problem-solving in the final year projects of Electrical Engineering (EE), it is essential to have originality in academic excellence, profession competency, and commitment to the integrity of research. Aside from ethical considerations, plagiarism in final year projects directly hinders student learning and devalues the technical qualifications they achieve. Therefore, plagiarism checking is critical to ensure the integrity of academic standards, to protect intellectual property, and to ensure the ethical standards of writing. Plagiarism checking confirms scope of originality in academic work and research by maintaining the integrity of academic honesty, which otherwise may risk penalties and possible legal consequences. Certain professions, as well as creative writing, rely on plagiarism checking to protect the rights of authorship and to maintain an author’s integrity and credibility (or their reputation). Also, plagiarism checking informs search engine optimization (SEO), as duplicate content is penalized by search engines, and can affect a content producer's walking and visibility online. By recognizing originality and independent thinking in academic writing and submissions, plagiarism checking can assist in maintaining the quality of written content across all domains, while maintaining the originality of the writing itself.

Additionally, faculty members must take proactive measures in monitoring and preventing plagiarism using supervision, assessment redesign, and technology. As a result, this paper analyses the role of department in relation to upholding academic integrity of final year projects by determining common forms of plagiarism in the EE Department of POLIMAS and suggesting improvements for more efficient detection and prevention. For that reason, the goal of this study is to determine the common forms of plagiarism in Electrical Engineering (EE) diploma final year projects, evaluate the effectiveness of current anti-plagiarism processes at a

technical college, and suggest pragmatic solutions for faculty to reduce plagiarism in EE assignments.

2.0 LITERATURE REVIEW

Plagiarism in engineering education is a major concern, as a result of increased access to websites and portals exposing project reports and AI-enabled content (Karnalim et. al., 2024). Khaled & Al-Tamimi (2021) identify two primary types of plagiarism: (1) verbatim/literal plagiarism, defined as copying word-for-word from another source with no intervention on the part of the plagiarizer, and (2) intelligent plagiarism, defined as taking the content of other work and transforming or modifying it in a variety of ways that make it less clear where the authorship originated from. Intelligent plagiarism can take the following forms: rewording the idea, translating it into a different language, or manipulating the text while it retains its intended meaning (Khaled & Al-Tamimi, 2021). Furthermore, previous statements about plagiarism research (see Adavala, 2023; Halak & El-Hajjar, 2019; Kulkarni et. al., 2021; Soni G.K., 2018) outline that plagiarism has many faces, including copy and paste plagiarism, contract cheating, data plagiarism, accidental or inadvertent plagiarism, manual text modification plagiarism (i.e., using software to change the text), patchwork or mosaic plagiarism, paraphrase plagiarism, self-plagiarism, automated text generation, source-based plagiarism, and collusion among students. All of these plagiarisms are problematic and complicate the integrity of academic work.

Copy-paste plagiarism is taking and copying text, sections of code, and other content verbatim and not citing the sources, while contract cheating is when someone else completes an assignment. Data plagiarism happens when datasets are used without proper acknowledgment. Accidental plagiarism occurs when, unknowingly, when similar ideas and presented without the sources' citation. Manual text modification is when altering a piece of text from a URL or source, and trying to bypass detection by the plagiarism software. Patchwork plagiarism is when you have copied and are placing it together, combined with your own originality, but it is very difficult to detect. Paraphrasing plagiarism is when you have essentially rewritten the source without acknowledgement and citation. Self-plagiarizing occurs when you reuse your previous work with acknowledgement and citation. Automated text generation from AI tools and rewrite it with AI tools that avoid detection of plagiarism. Source-based plagiarism occurs when citation practices are misleading or inaccurate, while student collusion is when a student copies another student. These types of plagiarism are

relevant in highlighting that there still needs to be institutional academic policies addressing the issue in the academic environment, and, through educational/instructional design, there is a better awareness to help maintain integrity.

Prior research indicates a number of reasons for plagiarism with one of them involve not understanding citation and referencing practices (Ganesh Kumar, 2018). Some learners may not fully be aware and/or do not recognize the difference in paraphrasing and quoting directly which can lead to unintentional plagiarism. This is similarly exhibited in the research conducted by Khaled & Al-Tamimi (2021), where the authors found that university, school, and higher education sector instances of paraphrasing was used 75% of the time and those depicting repetitive researched incidents was 71%, instances of secondary source plagiarism were 69%, instances of Duplication were 63%, and instances of verbatim copying was 59%. Additionally, students are under so much pressure to meet specific academic deadlines, that they often take short-cuts, which includes sometimes copying and pasting content seemingly out of convenience or work overload situations to not give credit to the work. There is also limited access to original resources, such as books, journals, research papers, which entail further impact of these issues and multiple adaptations, forcing students into using the easiest available online materials. Not only that but to further the problem, examine how widespread the internet is to enable the quick access to volumes of information, we can see how tempting this habit of copying and pasting material and not giving credit can become for students in terms of reaching that final task for completion (Siddhpura, Arti & Siddhpura, Milind, 2021). Additionally, the lack of faculty instruction on proper ethical research conduct results in students lacking the abilities to cite sources, organize their work, and stop plagiarism. Based on research findings from Berrezueta Guzman et al. (2023) students that have not learned plagiarism controls will likely commit plagiarism.

Plagiarism certainly presents an important threat to academic integrity in relation to the values of honesty, originality, and growth of intellectual character. Engaging in such dishonesty limits the students' chances to develop important skills connected to critical thinking, inquiry and writing. Additionally, students' dishonesty will reduce their academic performance and limit their pathway to a robust future. The implications of academic dishonesty also extend to educational institutions, as a high frequency of plagiarism acts can create detrimental effects on institutional reputation and decrease value for their degree, while also minimizing public trust. Finally, plagiarism threatens consequences not only to students, which could involve

academic penalties like failure or suspension, but would also impact faculty's fate for not requiring appropriate citation. In a broader scope, plagiarism adversely influences the overall quality of academic research, impedes innovation in the field and limited knowledge development. Plagiarism prevents the original meanings of the ideas and information of others from assisting creativity and opportunities for substantial positive contributions to the academic community and society.

Earlier research indicates an effective approach to combating plagiarism requires a comprehensive strategy that integrates technological tools, institutional policies, academic oversight, and educational initiatives (Adavala, 2023; Fauzi, Iqbal, & Haryanti, 2021; Halak, & El-Hajjar, 2019; Jiffriya, Jahan, & Ragel, 2021; Kulkarni, Govilkar, & Amin, 2021; Mansoor & Al-Tamimi, 2022). When it comes to institutions, explicit academic integrity codes and policies establish standards for ethical behavior and consequences for academic dishonesty. One way to combat unoriginal content is that faculty members should promote academic integrity through explicit guidelines, designing assignments that foster original thought, and employing detection tools like Turnitin, Grammarly and MOSS for code submissions. Khaled & Al-Tamimi (2021) noted that there are 13 of the most frequently mentioned plagiarism detection software between 1994 and 2020, and they evaluated each for scope, size of the database, and allowed file formats. The sequencing of detection began with MOSS (Measure of Software Similarity) in 1994, followed up by iThenticate in 1996, JPlag in 1997, and the Glatt Plagiarism Screening Program (GPSP) in 1999. Then Turnitin emerged in 2000, and the software software that came after it – Plagiarism Checker (2006), Plagiarism Scanner (2008), PlagTracker (2011), PlagScan (2015); Exactus Like was released in 2016, alongside Grammarly (which was then further developed in 2018); the most recent software being DupliChecker launched in 2020. The use of these plagiarism detection software is certainly is helpful in terms of identifying unoriginal content and promoting accountability.

Moreover, research has shown that various methods can help detect different types of plagiarism and we must describe well-established, specialized detection methods that are suitable for the type of content we are evaluating. (Chandere, Satish, & Lakshminarayanan, 2021). As mentioned by Jiffriya, Jahan & Ragel, (2021), there are two primary types of plagiarism detection tool specifically in the academic field: 1) source code plagiarism detection, and 2) natural language plagiarism detection. For natural language plagiarism detection, it can be categorized based on the mode of used, mode of service (free or paid

version), language detection (monolingual or cross-lingual) and type of service (web based or standalone). A few examples of them such as Turnitin is widely used in academic settings, focusing on a vast academic database to check for similarities in student submissions. Grammarly Plagiarism Checker is designed for online content, scanning web pages, articles, and other digital resources for copied text**.** iThenticate is commonly used for research publications, providing a thorough check against a wide array of scholarly papers, journals, and articles to ensure the originality of academic research. Copyscape specializes in detecting plagiarism in web content, making it ideal for checking the uniqueness of articles, blog posts, and online copy. These tools offer targeted solutions to ensure content integrity across various domains. However, our study focuses on analysis of the previous research, existing plagiarism detection tools, features of popular plagiarism detection tools, and their challenges in plagiarism detection.

3.0 METHODOLOGY

This methodology focused solely on quantitative document analysis of Turnitin similarity reports. This approach ensured objectivity, consistency, and ease of replication while aligning with the research aim to improve plagiarism awareness through technological intervention. Although the study lacked survey-based perception data, the robustness of standardized Turnitin scores provided a valid foundation for meaningful interpretation and reflection.

3.1 Research Design

This study adopts a qualitative action research approach, aimed at improving students' awareness and control over plagiarism by systematically integrating Turnitin into the academic writing process for Final Year Projects (FYPs). The research was conducted within the Department of Electrical Engineering (JKE) at Politeknik Sultan Abdul Halim Mu’adzam Shah (POLIMAS), focusing on DET50102-Project 2 students.

Action research was selected due to its relevance and adaptability in contemporary educational settings, where educators act as both change agents and reflective practitioners. This approach allows for continuous improvement through iterative cycles of planning, action, observation, and reflection (Mertler, 2020). In this study, the researcher who also serves as the

course lecturer undertook a dual role as both implementer and observer of the intervention, thereby ensuring contextual alignment with the classroom dynamics and student responses.

3.2 Participants

The participants consisted of 144 final-year students enrolled in the DET50102 – Project 2 course, comprising three different diploma programmes offered at Politeknik Sultan Abdul Halim Mu'adzam Shah. These included 86 students from the Diploma in Electrical Engineering (DET), 45 students from the Diploma in Electrical and Electronic Engineering (DEE), and 13 students from the Diploma in Electronic Engineering (Communication) (DEP). All students were required to submit their Final Year Project (FYP) reports through Turnitin as part of the formal academic assessment process. This group was purposefully selected due to the report-based nature of their coursework, in which issues related to plagiarism and academic integrity are highly relevant and present significant risks if left unaddressed.

3.3 Data Collection Instrument

The primary and sole instrument used in this study was the Turnitin Similarity Report, a document automatically generated upon the submission of each student's FYP report to the Turnitin platform. These reports quantify the level of textual similarity between a student's submission and existing online sources, databases, and previously submitted work. This approach positions Turnitin not just as a detection tool but as a source of measurable and standardized data for academic integrity assessment (Morris, 2022).

3.4 Data Collection Procedure

The research procedure followed a structured sequence aligned with the action research cycle. Students were guided through Turnitin usage from initial submission to feedback-based revision. The step-by-step process involved instructor support, similarity report analysis, and opportunities for resubmission. This procedure is illustrated in Figure 1, which summaries the entire workflow of Turnitin implementation during the Final Year Project (FYP) submission.

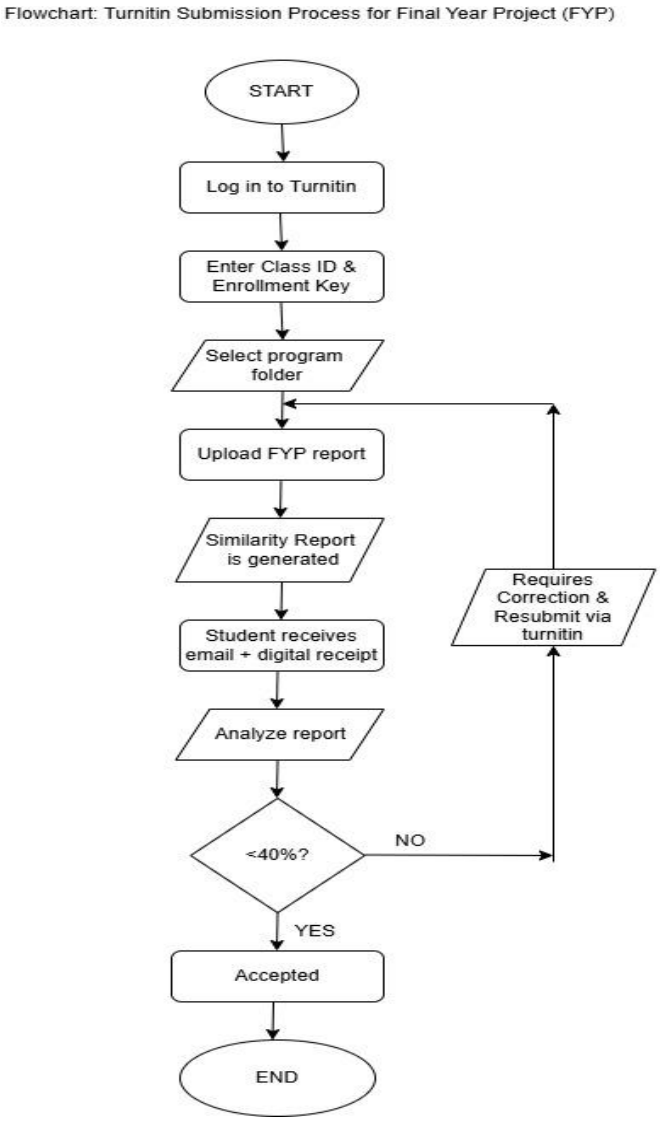

Figure 1. *Turnitin Submission Workflow for Final Year Project (FYP)*

As shown in Figure 1, students submitted their reports to Turnitin, reviewed the generated similarity reports, and resubmitted them if necessary. The lecturer monitored these steps and provided guidance throughout, ensuring compliance with the plagiarism policy (<40% similarity threshold).

3.5 Data Analysis

A descriptive analysis was conducted using frequency and percentage distribution to categorize the similarity scores. Patterns were observed to identify trends and the proportion of

students demonstrating high, moderate, or low levels of academic originality. The findings were interpreted to assess whether the integration of Turnitin had a significant role in reducing plagiarism. While no formal surveys or interviews were conducted, informal lecturer observations were used to complement the numerical data. These observations noted student behaviors such as repeated submissions, engagement with Turnitin feedback, and overall attitudes toward the plagiarism-checking process.

3.6 Ethical Considerations

All student data were handled with strict confidentiality. Similarity reports were anonymized, and the study received departmental approval prior to implementation. Students were informed of the purpose of using Turnitin and its role in supporting academic integrity.

4.0 DATA ANALYSIS AND FINDINGS

This section presents and discusses the data collected from the Turnitin similarity reports of 144 final-year students across three diploma programmes at Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS): Diploma in Electrical Engineering (DET), Diploma in Electrical & Electronic Engineering (DEE), and Diploma in Electronic Engineering (Communication) (DEP). The findings are categorized into three key areas: distribution of similarity scores, impact of resubmission, and comparative analysis across programmes.

4.1 Distribution of Turnitin Similarity Scores (First Submission)

The Turnitin similarity scores for first submissions revealed encouraging trends in academic integrity across all three programmes. Table 1 summarizes the similarity score categories across all three programmes for the first submission.

Table 1

Similarity Score Distribution (1st Submission)

Programme	No. of Students	<20% (High Originality)	20–39% (Moderate)	≥40% (Requires Revision)
DET	86	64 (74.4%)	21 (24.4%)	1 (1.2%)
DEE	45	34 (75.6%)	10 (22.2%)	1 (2.2%)
DEP	13	10 (76.9%)	3 (23.1%)	0 (0%)

Total	**144**	**108 (75.0%)**	**34 (23.6%)**	**2 (1.4%)**

The 144 final-year students involved, a significant majority, 108 students or 75%, achieved scores below 20%, indicating a high level of originality in their written work. Only two students (1.4%) exceeded the institutional similarity threshold of 40%, reflecting a minimal incidence of potential plagiarism. This trend was consistent across programmes, with DET and DEE each recording only one case of high similarity, while DEP reported zero cases. These findings suggest that students across disciplines are not only aware of the academic integrity policies but are also able to apply proper paraphrasing, citation, and referencing skills in their Final Year Project (FYP) submissions.

The data also points to the positive impact of early integration of Turnitin as a pedagogical tool, rather than solely as a detection mechanism. Most students within the <20% similarity category DET (74.4%), DEE (75.6%), and DEP (76.9%) indicates that plagiarism prevention strategies embedded in coursework may be yielding results. Particularly in DEP, the absence of high-similarity cases underscores the potential effectiveness of smaller cohort engagement or more targeted writing support. These findings align with recent literature advocating for formative use of plagiarism detection systems to foster a culture of academic honesty and self-regulated learning (Lo, 2020; Morris, 2022).

Figure 1 shows the pie chart representing the originality level across the cohort, showing that two-thirds of students produced highly original work on their first attempt.

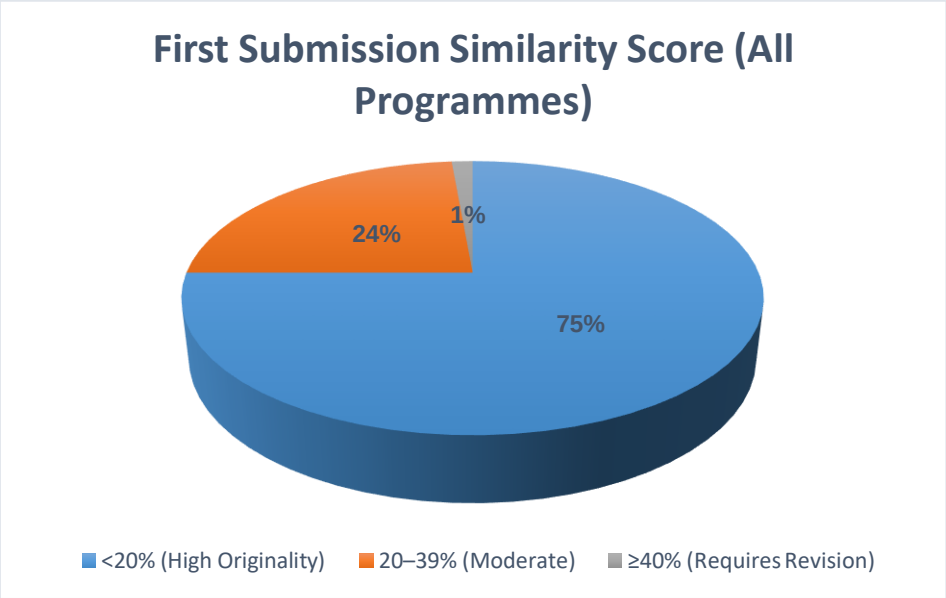

Figure 1: *First Submission Similarity Score (All Programmes)*

The pie chart visually illustrates the distribution of Turnitin similarity scores for the first submission of Final Year Project (FYP) reports across all three diploma programmes. It clearly shows that most students, 75%, achieved a similarity score of below 20%, represented by the dark blue segment. This category reflects high levels of originality and compliance with academic integrity standards.

The orange segment represents 23.6% of students who scored between 20% and 39%, indicating a moderate level of similarity that is still within the institution's acceptable range. Meanwhile, the small green slice just 1.4% indicates those who exceeded the 40% threshold and were required to revise and resubmit their reports. The chart reinforces that most students produced original work on their first attempt, and that plagiarism was minimal at the point of initial submission.

4.2 Turnitin Resubmission Outcomes

Two students who initially scored ≥40% was resubmitted to their reports, and both of them improved their similarity scores, reducing them below the threshold. Additionally, several students with scores in the 20–39% range voluntarily resubmitted to reduce the percentage of plagiarism similarity as shown in Figure 2.

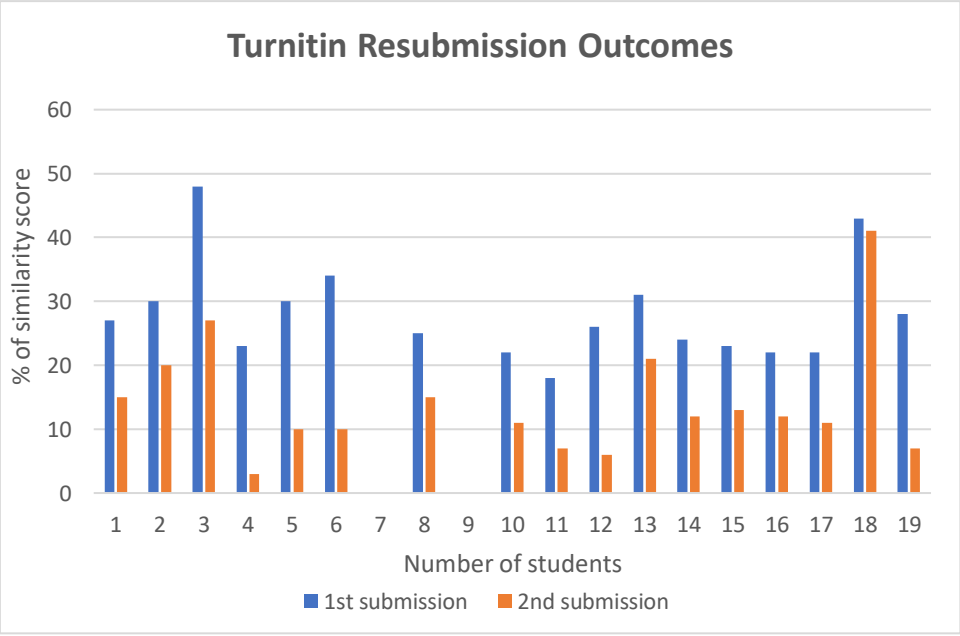

Figure 2: *Turnitin Resubmission Outcomes (All Programmes)*

The analysis of Turnitin resubmission outcomes highlights two distinct groups of students: those who were required to revise their work due to high similarity scores, and those who voluntarily resubmitted for further improvement. Only two students (1.4% of the total cohort) recorded similarity scores above the institutional threshold of 40% on their first submission. Both students showed marked improvement after resubmitting their reports—one reduced the similarity score to the minimum acceptable limit of 40%, while the other managed to bring it below the threshold. These results demonstrate that Turnitin effectively flags high-risk cases and, more importantly, that structured resubmission procedures encourage students to take corrective action through improved citation and paraphrasing strategies.

In addition to the required resubmissions, seventeen other students voluntarily chose to revise and resubmit their reports despite having acceptable similarity scores (below 40%) in the first submission. These students displayed substantial reductions in their similarity percentages, with several dropping from the 20–30% range to under 10%. This pattern suggests a high level of engagement with the feedback provided by Turnitin, and a commitment to producing original academic work. The willingness to revise beyond compliance indicates the emergence of a proactive academic culture where students take responsibility for the integrity of their writing, aligning with current best practices that advocate the formative use of plagiarism detection tools (Lo, 2020; Morris, 2022).

4.3 Qualitative Reflections and Pedagogical Insights

Although this study did not use formal survey instruments, informal reflections from lecturers yielded useful qualitative information about student behaviours and attitudes during the Turnitin submission process. It was reported that students were generally positive towards the similarity reports produced by Turnitin, treating these not as punitive actions, but as feedback. Many students started to identify recurring issues with formal conventions such as format for citations, over-quoting and inadequate paraphrasing. This increased comprehension of the norms of academic writing illustrates a development in their comprehension of academic integrity, even without the addition of formally structured interventions.

More notably, lecturers were surprised to witness that several students engaged in revising their work even if they had a similarity score that was acceptable. This behaviour

demonstrates a meaningful shift in student mindset, from complacency to active engagement with academic requirements. This supports the assertion by Lo (2020) and Morris (2022) that plagiarism detection tools such as Turnitin can have the most value as a learning tool in teaching and learning engagements rather than simply as a gatekeeping measure. As Morris (2022) stated: "As students are allowed to revise based on feedback, they engage more meaningfully with it, rather than being penalised". The experience in this study supports this stance, demonstrating how academic integrity can be cultivated through iterative feedback and pedagogical support.

4.4 Summary of Key Findings

Results from this study provide strong evidence of Turnitin's value as a formative educational tool and its ability to support academic integrity and engage students with academic writing practices. The 75% of students who had similarity scores below 20% indicated an initial commitment to academic integrity and foundational expertise in relation to citation and originality. The 100% improvement rate of students who did resubmit on average, whether it was the result of high similarity threshold or by choice of own volition, is demonstrable evidence of the platform's usefulness in improving academic writing through developmental learning.

The amount of voluntary resubmission from students who were already well below the similarity thresholds indicates a greater level of engagement. This behaviour illustrates how students see Turnitin not merely as a tool for policing their work but also as a support tool that allows them to take ownership of their own learning. This engagement with feedback shows a movement away from submission based on compliance to a self-regulation arrangement of learning and performance improvement.

These findings are consistent with previous studies conducted by Bretag et al. (2019) and Khan et al. (2021), confirming that plagiarism detection tools in educational environments can do much more than just deter plagiarism. In a culture of academic development, tools such as Turnitin may act as a driver of ethical scholarly practices, in line with the view that instilling academic integrity is better built into practices through education than punishment. Overall, this study shows how anti-plagiarism software can be transformative, as long as it is treated intentionally, as part of a thoughtful, pedagogically designed strategy that includes feedback, reflection, and student agency in learning.

5.0 DISCUSSION AND CONCLUSION

The data collected from this study provides substantial evidence that the use of plagiarism detection software, with particular reference to Turnitin, is fundamental in establishing academic integrity and influencing students' engagement with academic writing at the diploma level in Electrical Engineering (EE) education. Unfortunately, POLIMAS is still faced with instances of plagiarism in final year projects, and in this setting, Turnitin acted as a detection, and an educational resource to promote ethical academic conduct and reflective student learning.

By analysing the data, it was revealed that 75% of students scored below the 20% similarity threshold on their first submission, which showed that students had an initial understanding of correct citation and originality. Additionally, the 100% improvement rate for students that submitted their assignments again (either because of feedback, or they just figured it was worth a try), to highlight the effectiveness of tools like Turnitin in facilitating students' iterative learning and academic self-regulatory behaviour. Importantly, even students who had met the institutional similarity threshold willingly re-did their work and this demonstrates a student-led attitude towards academic engagement with their own personal or academic development. This behaviour demonstrates that if we position Turnitin and the learning that it encourages, as formative rather than punitive impacts, it can facilitate students making choices and taking ownership of their learning.

While these outcomes are encouraging, the study also demonstrated that continuing challenges like a lack of understanding of citations, ease of access to online materials, time constraints, and greater access to AI-generated text also lead to plagiarism in EE students and make detection significantly more difficult, as well as indicating the limitations of purely relying on technology. In this time, the role of faculty is even more urgent. Educators can not only show students how to use the detection tools effectively, but they can also support the understanding of the ethical dimension of academic work. In order to ensure the plagiarism can be prevented effectively, the Department of Electrical Engineering at POLIMAS must continue to combine the use of technological tools, education, and policy enforcement so that students graduate not only with technical skills, but also a clear ethical standard.

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