INCREASING STUDENTS' PASS RATE OF G.C.E. ADVANCED LEVEL ENGINEERING TECHNOLOGY STREAM AT THE C.W.W. KANNANGARA CENTRAL COLLEGE, MATUGAMA

E.M.N.D. Ekanayake[1*] and Samantha Rathnayake[2]

[1]C. W. W. Kannangara Central College, Sri Lanka [2]Postgraduate Institute of Management, University of Sri Jayewardenepura, Sri Lanka

Education is crucial for shaping Sri Lanka's society, with national-level examinations playing a significant role. Concerns have arisen over A/L (Advanced Level) examination pass rates, particularly in the engineering technology stream. The aim of this study was to increase students' pass rate in the A/L engineering technology stream in the selected school from 51.38% to 60.00% within a year under the proposed study framework comprising three components: process management, training and development, and a monitoring system. The methodology involved qualitative and quantitative approaches. Structured interviews with six engineering technology teachers provided insights to developing a questionnaire, which was distributed to 100 students who had taken the A/L engineering technology exam. Quantitative data was extracted from various sources to identify associated problems: incomplete practicals, absenteeism, and missed teaching hours. Root cause analysis using the Ishikawa diagram identified issues such as no coordination between the lab timetable and class time tables, unavailability of a fixed lab time table, the standard school examination process, training opportunities, inadequate supportive programmes for students, unavailability of internal supervision plans, and having no standards process for the analysis of students' marks. Proposed solutions included implementing Standard Operating Procedures (SOPs) and flow charts for better process management, conducting comprehensive training needs analysis, designing and evaluating training programs, and introducing checklists and Key Performance Indicators (KPIs) to enhance supervision. These measures aimed to systematically address the issues and improve educational outcomes at the school. The study aimed to increase the pass rate in the engineering technology stream by 18%, equating to 14 more students passing. Process management is expected to enhance both teacher and student skills. Training and development efforts aimed to boost student engagement, improve teacher satisfaction, and enhance teaching effectiveness. The monitoring system focused on increasing teacher participation, enhancing the teaching-learning process, and improving student performances. The study suggested that increasing pass rates is a significant indicator of the school's overall quality and effectiveness. Effective planning in the school's education development sector is essential for improving pass rates. This includes encouraging adherence to established processes and protocols, identifying staff training needs, and implementing regular observation and feedback mechanisms.

Keywords: Students' pass rate, Process management, Training and development, Monitoring system, Engineering Technology

[*]*Corresponding Author: danuekanayakearm@gmail.com*

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INTRODUCTION

Education plays a crucial role in shaping Sri Lanka's society and progress. According to the National Education Commission (2016), the primary goal of the educational system in Sri Lanka is to nurture individuals who can effectively apply their educational accomplishments, which is demonstrated through their skills and abilities, to positively impact the welfare of the nation and the overall quality of life for its people. The educational system comprises various phases such as early childhood education, primary and secondary education, and higher education, as outlined by the National Education Commission in 2022. It significantly influences academic accomplishments and outcomes in national exams. In the hierarchical framework of education in Sri Lanka, zonal and divisional bodies, along with individual schools, play integral roles in the multiple facets of school education. This includes tasks such as shaping curriculum, developing teaching approaches, conducting student assessments, and facilitating professional growth.

The school's responsibilities encompass curriculum delivery, academic guidance, facilitating effective teaching and learning, student assessment, and enhancing academic achievements. Primarily, student performance is evaluated based on their success rates in national level examinations, including the Grade Five Scholarship Exam, the General Certificate of Education Ordinary Level (O/L), and the General Certificate of Education Advanced Level (A/L). In Sri Lanka, the A/L examination offers six primary subject streams: arts, science, mathematics, commerce, engineering technology, and biotechnology. Nevertheless, there has been growing concern over the pass rates in the A/L examination in the country over time

The introduction of the A/L technology stream in Sri Lanka was a significant step to address the requirements of a changing global environment, particularly the pressing demand for proficient individuals in the engineering sector. This stream, comprising engineering technology and biotechnology, is currently the most sought-after among A/L students due to its relevance and potential. This research aims to address the issue of low pass rates in the A/L examination, specifically within the engineering technology stream. It proposes appropriate strategies to increase the pass rate of students, focusing on a selected school, the CWW Kannangara Central College in Matugama. The approach involves a field research study to enhance the pass rate.

THEORETICAL BACKGROUND TO THE PROBLEM

Students' Pass rate

The pass rate of students is a critical measure of their academic success and proficiency in examinations. Students' pass rate is a benchmark or criterion for measurement when evaluating a school's performance (Adhikari et al., 2022). The pass rate, which represents the percentage of students who attain a satisfactory level of performance on standardised tests, is frequently reported for each school (Papke, 2005). According to Wyse and Anderson (2020), the pass rate is an important indicator that measures the percentage of students who successfully pass high-stakes examinations.

Process Management

Process management plays a vital role in optimizing business operations and ensuring efficiency. Process management is recognized as an effective method for overseeing, regulating, and enhancing business operations (xu et al., 2018). Process management is crucial in education, providing a

structured method to enhance educational results by streamlining the flow of resources, information, and staff. Numerous research works underscore the significance of clearly defined instructional processes. According to guskey (2007), there is a focus on the necessity of explicit learning goals, efficient teaching methods, and continual formative evaluation to inform instructional choices.

Training and Development

Training and development play a crucial role in enhancing individual and organisational performance. Training and development are considered to be the process through which individuals gain a range of skills and knowledge to enhance their effectiveness in areas such as leadership, direction, organisation, and influencing of others, among others (Lacerenza et al., 2017). Through training, individuals acquire new knowledge and develop relevant skills that enable them to perform effectively. The benefits and impacts of training are multifaceted, encompassing improved employee performance, enhanced job satisfaction, and organisational growth. Many studies on training expenses and advantages highlight both the direct and indirect costs and benefits associated with the training initiatives conducted (Murray & Efendioglu, 2007).

Supervision System

The availability of a robust supervision system is essential to preserving the stability and effectiveness of an organisation. The supervision system is an approach to oversee and improve performance by reinforcing accountability, enhancing the importance of performance appraisal, and ensuring its effectiveness (Sun et al., 2021). Sahin et al. (2011) stated that the supervision process includes a range of actions that focus on enhancing the effectiveness of education and learning. These actions involve implementing programs and support systems, promoting self-control and guidance.

Objectives of the Study

The aim of this study was to increase students' pass rate in the A/L engineering technology stream at the Matugama CWW Kannangara Central College from 51.38% to 60.00% within a year, under the proposed study framework.

Methodology

The research methodology involved both qualitative and quantitative approaches. Qualitative data was gathered through structured interviews with six teachers selected from the engineering technology section. Based on the insights gathered from these interviews, a questionnaire was developed and distributed, via Google forms, to 100 students who had undertaken the A/L examination in the engineering technology stream. The aim was to pinpoint any related issues that align with the main problem statement. Participants who completed the questionnaire was selected through random selection. Quantitative data (from years 2018 to 2022) was gathered from various sources including school documents, laboratory record books, class registers, attendance logs, and the school's website. The Ishikawa diagram analysis was utilised for root cause analysis, to identify the root causes of the associated problems that were identified. According to available literature, the authors propose a study framework and solutions to address these root causes.

RESULTS AND DISCUSSION

Based on the responses obtained from the interviews, the associated problems contributing to the low pass rate of the A/L engineering technology stream were identified to be as follows: incompletion of recommended practical sessions, students' absenteeism, students missing teaching hours, a lack of exam practice, a heavy curriculum, and students obtaining low marks at the term tests. Additionally, student responses to the questionnaire revealed that the key problems are the incompletion of the recommended practical sessions, students' absenteeism and students missing teaching hours (Figure 1).

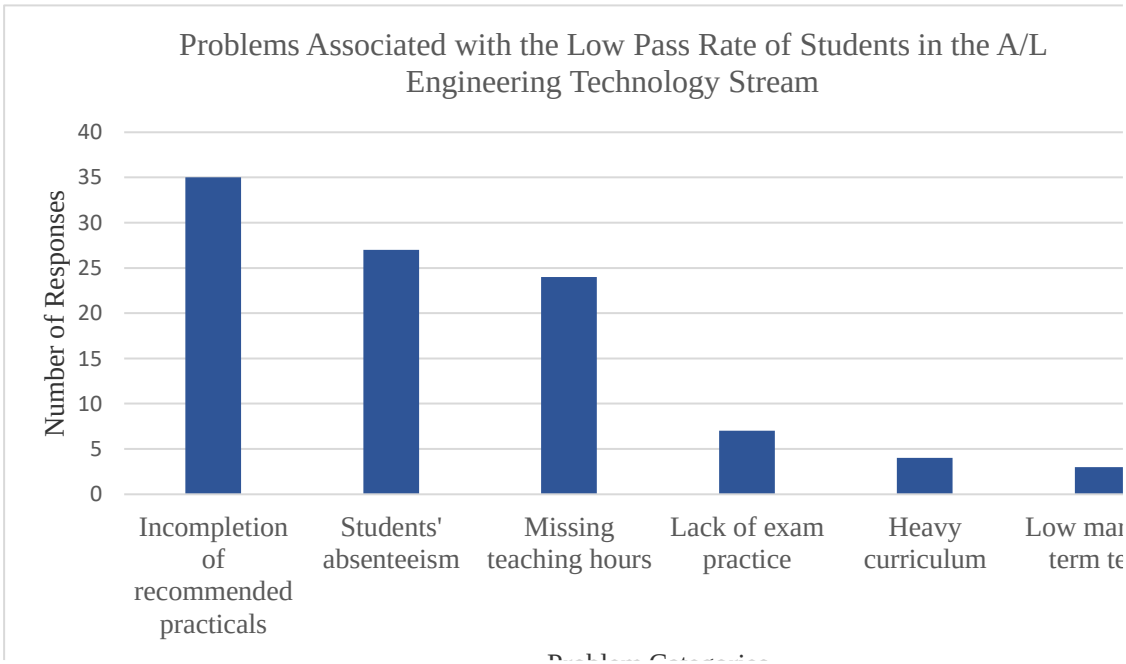

Figure 1: Problems Associated with the Low Pass Rate of Students in the A/L Engineering Technology Stream

Based on the quantitative data gathered from the years 2018 to 2022, focussing on the engineering technology stream, the average practical completion rate was 40.00%, the average student absenteeism rate was 32.17%, and the average missed teaching hours was 27.07%. The Ishikawa root cause analysis, which was conducted under the categories of process management, training and development, and the monitoring system, revealed seven root causes, which are the lack of coordination between the lab timetable and class timetable, unavailability of a fixed lab timetable, standard school examination process, availability of training opportunities, inadequate support programmes for students, unavailability of internal supervision plans, and lack of a standard process for the analysis of students' marks. To address these root causes, the authors suggested a study framework, given in Figure 2 below. The authors proposed introducing Standard Operating Procedures (SOPs) and flow charts under the process management component. Under the training and development component, the proposals included conducting a training needs analysis, developing a training design, and completing training evaluations. For the supervision system, the introduction of checklists and Key Performance Indicators (KPIs) was proposed.

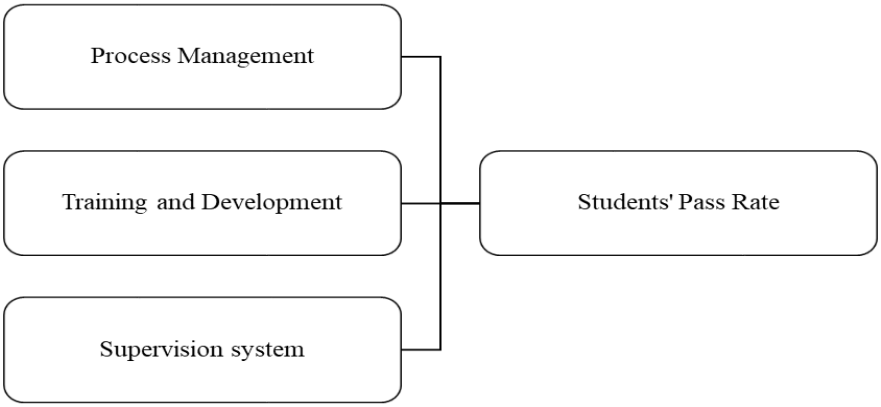

Figure 2: Study Framework

As described by Adhikari et al. (2022), students' pass rate is a benchmark or criterion for the measurement of a school's level of performance. This research aimed to increase the pass rate of students in the engineering technology stream from 51.38% to 60.00% within a year, representing an 18.00% increase. This increase in percentage equates to an additional 14 students successfully passing. Kusurkar et al. (2013) suggested that student-related factors have significant determinants of academic success among students. As suggested by Xu et al. (2018), process management is recognised to be an effective method for overseeing, regulating, and enhancing business operations. This research focussed on improving teacher participation, students' participation, and students' skills and competence. Setiasih et al. (2019) emphasised the importance of SOPs in the context of learning management, highlighting their significant advantages for teachers in efficiently performing tasks to accomplish educational objectives. As illustrated by Lacerenza et al. (2017), training and development is considered to be the process through which individuals gain a range of skills and knowledge to enhance their effectiveness in areas such as leadership, direction, organisation, and influencing of others. Gould et al. (2004) suggested that training needs analysis holds paramount importance within an organisation's overall training strategy for its staff or professional groups. Furthermore, a training layout that links learning directly to individual performances has demonstrated a strong correlation with increased transfer of learning among individuals. As described by Venter (2003), training and development remain crucial for enhancing teachers' efficiency and effectiveness. According to Sun et al. (2021), the supervision system is an approach to overseeing and improving performance by reinforcing accountability, enhancing the importance of performance appraisals, and ensuring its effectiveness. Sahin et al. (2011) suggested that studies within the education sector have found that supervisors offered suggestions for improvements in the system by emphasising recommendations for systematic restructuring and reorganising supervision services.

RECOMMENDATIONS

Enhancing students' pass rates holds immense importance for a school as it serves as a significant indicator of the overall quality and effectiveness of the school's operations. This research focused on addressing the issue of a low pass rate at the A/L exam in the engineering technology stream. To improve students' pass rate in the engineering technology stream, it is essential to have an effective planning of the education development sector in the school. Efficient process management is integral to maintaining a seamless and productive school environment, particularly in areas concerning teaching methodologies and student evaluation. To ensure efficient process management, encouraging adherence to established processes and protocols is important, as it promotes consistency and adherence to established procedures. It is crucial for educational institutions to prioritise effective training and development programmes for both students and staff to achieve higher performances. These programmes should be aligned with the overall goals of the school, ensuring that training initiatives directly contribute to desired outcomes, such as improved pass rates. Therefore, for the implementation of this research, it is crucial to identify the training requirements of the staff. Effective supervision at schools plays a crucial role in supporting teachers, enhancing student learning outcomes, and fostering a positive school environment. Regular observation and feedback mechanisms within a school environment form a foundation of effective professional development.

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