The Influence of Technical Skills, Internship Opportunities and Institutional Support on The Readiness of Students of Polytechnic Malaysia Tuanku Syed Sirajuddin to Work in The Renewable Energy Sector

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Abstract

This study is design to analyze the influence of technical skills, internship opportunities, and institutional support on the readiness of students of Polytechnic Malaysia Tuanku Syed Sirajuddin to work, especially in the renewable energy sector. Due to the growing demand for skilled lobour in renewable energy,higher education institutitions are required to equip student with strong technical competencies,adequate internship exposure,and sufficient institutional support.The study plants to distribute 140 quetionaires to students from rewable -energy related program.. Data will be analiyzed using SPSS through descriptive analysis,validity testing,reliability testing,and regressionprocedures once collection is completed.The expected findings will highlight the significan role of technical skills,internship opportunities,and institutional support in strengthening student readiness for renewable energy workforce.

Keywords— *Technical Skills; Internship Opportunities; Institutional Support; Student Readiness; Renewable Energy; SPSS.*

I. INTRODUCTION

A. Background

The global transition toward renewable energy has increased the demand for skilled human capital, especially in countries prioritizing sustainability and environmental protection.

This study is still in the planning phase; therefore, this paper presents a conceptual framework and proposed solutions based on a systematic literature review rather than empirical findings. Educational institutions must adapt learning systems to meet new industrial competencies, including technical and practical skills essential for renewable energy operations. At Polytechnic Malaysia Tuanku Syed Sirajuddin, preparing students for employment in this field is critical due to rapid technological changes and industry expectations.

Technical skills form the foundation of employability and significantly influence how well graduates adapt to the renewable energy sector. Strong technical capabilities, supported by practical application, enhance student readiness and enable them to meet real-world demands. Internships play an essential role by connecting classroom learning with actual industry environments, providing students with relevant experience and professional readiness.

Institutional support—including facilities, learning resources, mentoring, and career guidance—has been found to further influence student motivation, engagement, and readiness for work. Students who perceive strong institutional support demonstrate greater confidence in handling complex tasks and transitioning into the workforce.

Despite these positive developments, gaps remain between higher education outcomes and industry expectations. This study aims to investigate how technical skills, internships, and institutional support collectively influence student readiness. By integrating multiple readiness components, this study provides a foundation for improving renewable energy workforce prepara.

However, most previous studies on work readiness and employability have focused on general disciplines and traditional sectors, without specifically addressing renewable energy–related programs in Malaysian polytechnics. There is still a lack of empirical and conceptual work that integrates technical skills, internship opportunities, and institutional support into a unified framework for renewable energy workforce readiness. This gap highlights the need for a study that conceptually models how these three factors jointly contribute to students' readiness to work in the renewable energy sector

This paper contributes at both theoretical and practical levels. At the theoretical level, it proposes an integrated conceptual framework that links technical skills, internship opportunities, and institutional support to students' work readiness in the renewable energy sector, thereby extending existing employability and workforce readiness literature to a more specific and high-demand field. At the practical

level, the framework can guide polytechnic administrators, curriculum designers, and industry partners in developing more targeted interventions such as curriculum enhancement, structured internships, and institutional support programs to better prepare students for careers in renewable energy.

B. Problems

Based on the background and urgency of this research, "The Influence of Technical Skills, Internship Opportunities, and Institutional Support on the Readiness of Polytechnic Malaysia Tuanku Syed Sirajuddin Students to Work in the Renewable Energy Sector," the research problem can be formulated as follows:

1. How do technical skills influence student readiness for renewable energy employment ?
2. To what extent do internship opportunities enhance readiness to handle industry challenges ?
3. What role does institutional support play in shaping student readiness ?
4. Is there a synergistic effect among technical skills, internship exposure, and institutional support ?
5. How do students perceive the importance of these readiness components ?

C. The Proposed Solution

Based on the literature review, the study context, and the intended objectives of examining work readiness in the renewable energy sector, the following proposed solutions are presented as part of the research plan. These solutions do not represent empirical findings but serve as conceptual recommendations to strengthen student:

1. Enchance tecnical Skills-Based Curriculum
   A curriculum should increasingly that focuses more on the practical competencesies required skills needed in the renewable energy sector. This could include relevant technical training and the application of the latest technologies in learning.
2. Structured Internship Programs:
   Increasing collaboration with industry partners shoud be strengthened to ensure the availability of well designed high quality intership program that provide meaningful practical exposure.
3. Intensive Institutional Support:
   Increasing institutional support, including learning facilities such as laboratories equipped with the latest equipment and career guidance programs. Providing access to seminars, workshops, and mentoring sessions from professionals in the renewable energy sector.
4. Soft Skills Training:
   Providing training in the development of soft skills, such as communication, teamwork, and leadership, should be important in preparing students for the workforce.
5. Continuous Monitoring and Evaluation:
   Implement a monitoring and evaluation system to assess the effectiveness of existing training and internship programs. Adapt programs based on feedback from students, alumni, and employers to ensure relevance and effectiveness.
6. Renewable Energy Awareness Campaign:
   Organize campaigns to raise awareness about the importance of the renewable energy sector and its career opportunities. This can be done through social activities, seminars, or collaborations with environmental organizations.
7. Facilitate Alumni Engagement:
   Activate alumni who have successfully worked in the renewable energy sector to share their experiences and provide support to current students, thereby creating a strong professional network.

II. RESEARCH METHODOLOGY

This study uses quantitative methods with a descriptive design to analyze the influence of technical skills, internship opportunities, and institutional support on the readiness of Polytechnic Malaysia Tuanku Syed Sirajuddin students to work in the renewable energy sector. The following are details of the methods used:

1. Population and Sample:
   a. Population: The population in this study consists of all active students at Polytechnic Malaysia Tuanku Syed Sirajuddin enrolled in study programs related to renewable energy
   b. Sample: This study plan to distribute 140 quesionnaires to student enrolled in renewable energy related programs.The actual number of responses will be reported after data collection completed.
2. Data Collection:
   a. Questionnaire: Data will be collected using a questionnaire consisting of several sections:
   b. Technical Skills: Measures students' knowledge and practical skills relevant to the renewable energy sector.
   c. Internship Opportunities: Assesses students' experience and number of internship opportunities.
   d. Institutional Support: Measures students' perceptions of the support provided by the institution, such as learning facilities, mentoring, and training programs.

e. Job Readiness: Measures the level of student readiness to enter the workforce in the renewable energy sector.

3. Data Analysis:
   The data obtained will be analyzed using SPSS (Statistical Package for the Social Sciences) software. The analysis includes:
   a. Descriptive Statistics: To describe the sample characteristics and data distribution.
   b. Validity and Reliability Testing: To ensure that the research instrument adequately measures the variables.
   c. Multiple Linear Regression Analysis: To test the simultaneous influence of technical skills, internship opportunities, and institutional support on student readiness. This will provide information on the contribution of each variable to the dependent variable (job readiness).
4. Hypothesis Testing:
   The research hypothesis will be tested using a predetermined significance level (usually $\alpha = 0.05$). The results of the analysis will indicate whether there is a significant influence of the independent variables on the dependent variable.
5. Interpretation of Results:
   The results of the analysis will be interpreted to provide conclusions regarding the relationship between technical skills, internship opportunities, and institutional support on student job readiness. These findings will be discussed in the context of implications for educational policy and program development at the Polytechnic.

III. RESULTS AND DISCUSSION

A. Result

Since data collection has not yet been conducted, this section will present results after completion of the planned distribution of 140 questionnaires
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Expected outcomes include:

– Technical skills influence readiness .The first expected finding is that technical skills will significantly influence students' readiness for work. Students who possess strong knowledge of renewable-energy systems such as solar panel mechanisms, energy storage systems, and troubleshooting skills are expected to develop higher confidence when entering the workforce

– Internship opportunities enhance readiness

Second, internship opportunities are expected to enhance readiness substantially. Internships expose students to real industrial workflows, operational procedures, and safety standards, which are essential components of renewable-energy careers

– Institutional support influences readiness

Third, institutional support including laboratory facilities, mentoring, career guidance, and structured learning resources is expected to strengthen students' motivation, engagement, and confidence in facing workplace challenges

Fourth, the three variables technical skills, internship opportunities, and institutional support—are expected to interact synergistically, collectively contributing to stronger work readiness among students.

These expected results indicate that renewable-energy workforce preparation can be improved through an integrated approach combining technical competence, practical exposure, and institutional support

B. Discussion

After data collection is completed, findings will be interpreted and compared with prior studies on technical skills, internships, institutional support, and work readiness in renewable energy sectors

The expected findings of this study align with prior research showing that work readiness is shaped by a combination of technical abilities, practical experience, and institutional support. Technical skills serve as the foundation of employability in the renewable-energy sector, which is characterized by rapid technological advancements.

Internships play a crucial role in bridging theoretical knowledge with real-world practice. Through internships, students gain familiarity with industry standards, problem-solving processes, and workplace discipline. Previous studies also highlight that hands-on exposure accelerates students' adaptation to professional environments.

Institutional support represents another important factor. Universities and polytechnics that provide adequate laboratories, structured training programs, and career development services tend to produce students with better preparedness and stronger confidence levels.

When combined, these three factors form an integrated readiness model that prepares students for the complexities of the renewable-energy workforce.

IV. CONCLUSION

Based on the theoretical review and expected outcomes, this study concludes that:

1. Technical skills are expected to influence students' readiness for renewable-energy employment.
2. Internship opportunities are anticipated to contribute significantly to work readiness.

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3. Institutional support is expected to strengthen students' confidence, motivation, and preparedness.
4. All three variables are expected to act **synergistically** in shaping students' overall readiness for the renewable-energy workforce.

These findings may guide educational institutions in improving their curriculum, strengthening industry partnerships, and enhancing support systems to produce graduates who are competitive in the renewable-energy sector.

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