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PROJECT TITLE: An Analysis of Relevant Industrial Attachments in the School of Computing and Informatics at MUST

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ABSTRACT

This is a case study about the difficulties that students face with regard to industrial attachments-the most effective aspect of vocational education. This study is meant to identify system-related, institution-related, and personal barriers like skill mismatches, insufficient preparedness, little interaction with the industry, and personal barriers. The study employed a mixed methods approach of surveys, interviews, and academic records for data collection. Some of the key findings are that one of the major obstacles is that students lack practical and workplace adaptable skills; and that they do not access enough careers guidance services and industry partnerships. The study concludes that institutions must update curricula, integrate targeted mentorship, and strengthen industry collaborations to better prepare students for the workforce.

INTRODUCTION AND CONTEXT OF THE PROJECT

Industrial attachment is an imperative part of students' academic curriculum supplemented with hands-on experience. However, most students don't manage to find a relevant placement in their courses because of several other hindering conditions including lack of industry contacts; competition over very few such opportunities; and not being in line with what most industries require.

This case study attempts to analyse the core reasons for the trouble in achieving fitting industrial backing and proposes possible solutions to facilitate the institution-industry linkage.

OBJECTIVES AND GOALS

- Analyse historical causes under which students fail to get relevant industrial attachments.
- Assess the effectiveness of instituting support programs.
- Evaluate the extent to which academic programs meet industrial needs.
- Assess the preparedness and awareness of students to go through the application processes for attachments.
- Investigate the perceptions of industries about students attached to their organizations.
- Identify the communication gaps between institutions and industries.
- Generate good recommendations for increasing attachment results.
- Advocate the establishment of an equal and inclusive placement system for all attachments.
- Put emphasis on the importance of industrial attachment in preparation for working life.

Relevance of the project to the course or field of study.

This project is highly relevant to the Data Science field, where bridging the gap between theoretical learning and practical application is essential. Industrial attachment is a core component of most programs and, yet, students who take Data Science or any other technical science courses often face placement issues. For data science students, it seems most relevant in that applying some such skills as machine learning, data analysis, and statistical modelling to real-life situations is very important for any future in the student's own career. Thus, by identifying barriers to securing these attachments, this project is hence also contributing to better networking of data science and industries while providing improved academic support in data science, which also means better avenues for students from different backgrounds to have that much-needed hands-on experience.

PROBLEM STATEMENT

Though industrial attachment constitutes an important aspect of both the academic and professional life of students, many are failed by their inability to secure an attachment that is relevant to their field of study. This is as a result of many factors, such as ignorance on how to go about the application process, the engagement that industry has with academic institutions, and oversaturation in popular

fields. The matched or unmatched opportunities currently exist for students to acquire skills, expectancies of the industry, and a link between theory and application. This will create graduates without relevant experience and impact highly on employability and career readiness as well as fail to be able to respond to the dynamic demands of the industries they join.

WHY THE PROBLEM IS WORTH SOLVING

Better Job Opportunities for Students
Industrial attachments give students work experience, which eventually qualifies them for jobs after graduating. Without it, students may find it difficult to secure a position because lack of practical skills.

Helps Students Apply what they Learn
They get a chance to use their academic knowledge in practical situations at work. Without such experience, they might have problems grasping how to apply study knowledge.

Improves the School's Reputation
Schools facilitating their students in finding relevant industrial attachments are considered more effective thereby increasing the pull factor they have on potential students and employers. It demonstrates that these students are being prepared for the workforce.

Developed Important Links in Industry
Through these attachments, students can build relations with corporates which might end up resulting in job opportunities or internships. If this opportunity does not exist, then students will miss having acquaintances who may back their careers.

Avoids Career Confusion
From experience, students will understand better what kind of work they want. Exposure to the industry could land them in a profession not suited to their skills or interests.

Supports Growth in the Economy
In the right experience, students' better parts through the economy as they bring in new risking talent. Otherwise, there might not be enough skilled workers to sustain growth in industries.

Methodology

1. Research Design and Approach

This study applies a descriptive research design to explore the relevance of industrial attachments for students in the School of Computing and Informatics at Meru University of Science and Technology. The design is particularly appropriate for this topic, as it allows researchers to evaluate not only the distribution of attachment placements but also students' experiences, views, and challenges during their attachment periods.

The research employs a mixed-method approach, integrating both quantitative and qualitative techniques. Quantitative data was analyzed using a structured dataset, while qualitative insights were gathered from survey responses. Together, these methods ensured a holistic and comprehensive understanding of the factors that affect the relevance and effectiveness of industrial attachments.

2. Data Collection

Data was collected through two primary means:

Google Forms Questionnaires: A well-structured survey comprising both closed-ended and open-ended questions was distributed to students who had completed their industrial attachments. This helped capture their experiences, challenges, opinions, and suggestions concerning the attachment process. Key topics included tracking methods, relevance of the placement, communication with supervisors, and ideas for system improvement.

Excel Dataset: A detailed dataset was acquired, containing information about students from the School of Computing and Informatics, the companies where they were placed, and the geographical locations of these companies. This dataset provided context and deeper insight into the institutional environments where students completed their attachments.

3. Tools and Materials

The following tools and materials were used throughout the study:
Questionnaire: Designed using Google Forms with a combination of multiple-choice, checkbox, and short-answer formats.
Excel Dataset: Contained student registration numbers, academic programs, company names, and locations. The dataset was cleaned and enriched by adding a classification column for TECH and NO TECH companies based on relevance to computing fields.
Microsoft Excel: Used for data cleaning, categorization, tabular organization, and graphical analysis.
Excel functions included IF, COUNTIF, and COUNTIFS.
The dataset was transformed into a structured format to allow for efficient analysis.
Graphical Tools: A variety of charts were used to visually communicate key patterns:
Bar Graph: Compared courses (e.g., BBIT, BCSF) against counts of institution types (Government, NGO, Private).
Pie Charts: Illustrated overall distribution and percentage-based breakdown of institution types, and visualized subcategories such as NGO placements.

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5. Justification

The use of questionnaires was essential for capturing students' personal insights, concerns, and challenges during industrial attachment. This allowed the team to go beyond mere numbers and understand real-world experiences.
The dataset was crucial for examining the environments and institutions where attachments occurred. This helped establish correlations between company type, location, and attachment relevance.
Graphs and tables further enhanced the clarity and organization of findings, making it easier to interpret data and draw evidence-based conclusions.

6. Critical Thinking Strategies

Throughout the research process, critical thinking was actively applied:
Assumption Analysis: The initial belief that all attachments were relevant was disproven through categorization and survey feedback.
Evidence Evaluation: Data was cross-validated with student responses to uncover hidden challenges and support conclusions.
Alternative Exploration: Considered whether placement outcomes were affected by geography, personal effort, or institutional support.

Reflection and Insight: The team recognized gaps in tracking systems and recommended the implementation of a digital industrial attachment system to streamline placements and supervision.
This comprehensive methodology combined structured data analysis with lived student experiences, leading to deeper insights and actionable recommendations for improving industrial attachment processes.

PROBLEMS WE FACED AND HOW WE OVERCOME THEM

1.Access to Relevant Data

- Solution: Build trust with participants by emphasizing data confidentiality and the purpose of the research. Use multiple collection methods

2. Unwillingness to Participate

- Solution: Frame your project as beneficial to all parties involved.

3. Data Consistency Issues:

- Solution: Use structured questionnaires and ensure clear instructions. During analysis, focus on the most reliable data while noting gaps.

4. Bias in Responses:

- Solution: Keep questions neutral and avoid leading respondents.

5.Time Constraints:

Solution: Develop a clear timeline and prioritize critical tasks

6.**Ethical Considerations**: adhere to ethical guidelines for research, such as obtaining informed consent and anonymizing sensitive data

ANALYSIS AND RESULTS

- The data set acquired comprised of students with their school code number (CT201) and the companies they secured attachment.
  We grouped the data into tech and non-tech firms.
  The criteria used to group the companies as tech:
- **Computer Science and Computer Technology-** Tech startups, Software dev companies, Cybersecurity Firms, Research development labs, Telecommunications…
- **Information Technology and BBIT –** It consulting firms, Cloud and DevOps companies, ERP and business solutions, Corporate IT departments.
- **Data Science-** Big Data and analytics companies, E Commerce and FinTech, Healthcare
- **Information Science-** Library and Knowledge management (Archives), Law Firms, Corporate Communications
- **Computer Security and Forensics-** Government and Law enforcement (DCI), Financial Institutions (HQ)
- **Communication and Journalism-** News and broadcasting houses.

  The analysis indicates that out of the 1881 students who secured attachments, 1036 (55%) secured their attachment in non-tech firms, while 845 (45%) secured attachment in tech firms
  The majority 37% out of those who secured in **non-tech firms** were Computer Science students followed by Information Technology (25%) and Computer Security and Forensics (16%) …
  The majority 33% of those who secured in **tech firms** were BBIT followed by Information Science with 18%...

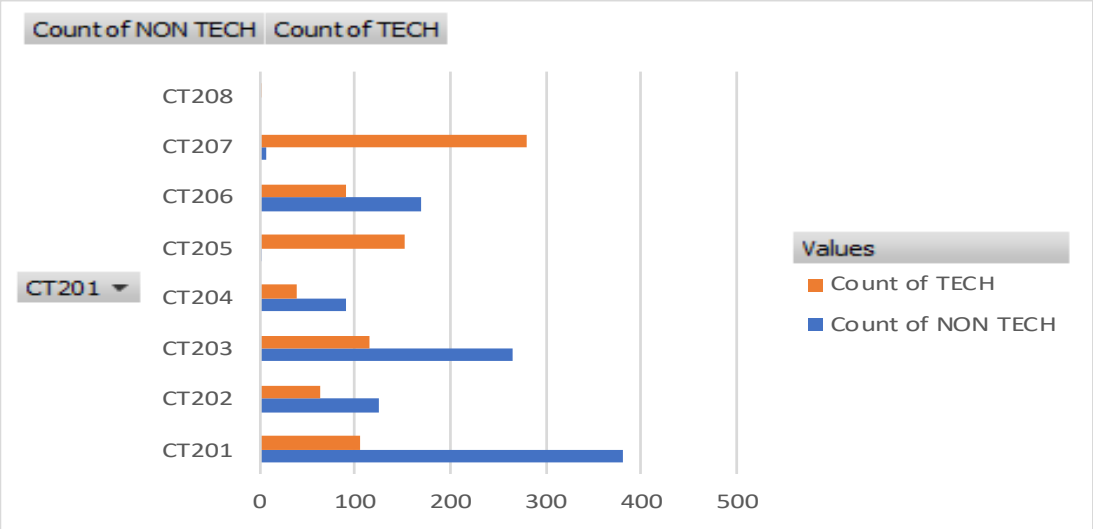
Results and Discussion

Based on the analysis we concluded that the students who secured their attachment in tech firms had:

- Increased learning opportunities.
- Vast networking community.
- Exposure to industrial tools.
- Soft skills development.
- Employability boost.

The tables that were used to come up with the conclusion are shown below;

COURSE	COUNT OF NON_TECH	Count of TECH	YES	NO
CT201(BCS)	381	106	1	4
CT202(BIT)	124	64	2	2
CT203(BCT)	265	114	1	3
CT204(BDS)	90	38	3	2
CT205(BIS)	1	151	3	0
CT206(BCSF)	168	91	2	0
CT207(BBIT)	7	280	5	1
CT208		1	1	0
GRAND TOTAL	1036	845	18	12



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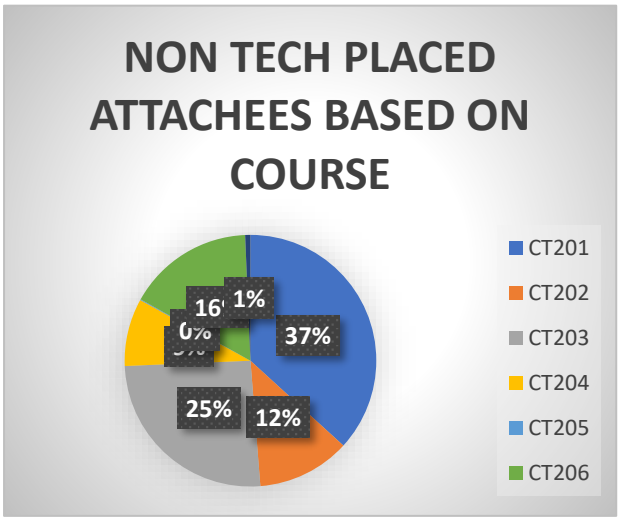

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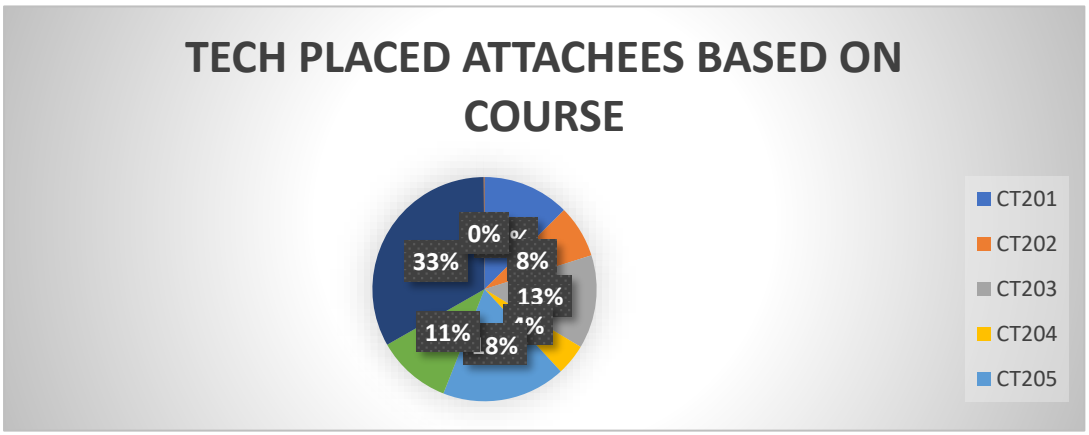
CT207(BBIT)	280	5	1
CT208	1	1	0
Grand Total	845	18	12



RECCOMENDATIONS

1.Enhance Career Services: Universities and colleges should strengthen their career services departments to actively assist students in finding placements. This includes organizing workshops on CV writing, interview preparation, and networking.

2.Build Industry Partnerships: Institutions can establish partnerships with companies to create dedicated attachment opportunities for students. This ensures a steady flow of placements and reduces competition.

3.Streamline Application Processes: Simplify the application process for students by providing clear guidelines and templates for resumes and cover letters. This helps students present themselves professionally.

4.Promote Awareness: Educate students about the importance of industrial attachments early in their academic journey. This includes highlighting the skills and experiences they can gain and how these contribute to their future careers.

5.Develop Mentorship Programs: Pair students with mentors in their field of study who can guide them through the process of securing attachments and navigating professional environments.

6.Leverage Technology: Create online platforms or apps where students can connect with companies offering attachment opportunities. These platforms can also provide resources like sample CVs and interview tips.

7.Advocate for Inclusivity: Ensure that attachment opportunities are accessible to all students, regardless of their background or field of study. This includes addressing biases in selection processes.

8. Digital system for tracking placements

9.Strong ties with the industries

10.Regular update of course content.

CONCLUSION

In conclusion, the case study highlights the struggles graduates face to secure industrial attachment. Some of the struggles they encounter include: Stiff competition , limited placement and for some the relevance of their work is ineffective .These issues not only hinder with the graduates progress of study and equipment of skills of their various fields but also the university-company collaboration to provide appropriate training. By identifying the communication gaps between institutions and industries and evaluating the extent to which academic programs meet industrial needs we will have empowered more university student to be at the top of their career fields and have molded them to greater professionals. Addressing these issues is not only a necessity but an investment to future developments and an improved technological field for upcoming students.