



MOI UNIVERSITY

ISO 9001:2015 Certified Institution

INDUSTRIAL ATTACHMENT SURVEY REPORT

2021

BY

IAN KIBET LEBOO

YUNUS MOHAMED MIRE

ERICK ODHIAMBO

ETHEKON EKAI ALEXANDER

PAUL WEKESA

FOREWORD

This survey is done by students for the students to give the academic and industrial supervisors a raw feel of the efficacy of the industrial attachment from the eyes of students. The industrial attachment is meant to make the students have a more practical feel of the content they learn in class. It is also meant to prompt them to see how professionals in their respective fields solve problems in the world in the lenses of the knowledge acquired in class. Besides, it is meant to polish their social interactions with people in their fields of professionalism now that effective communication is a key catalyst to successful organizational operations. This survey has assessed the experiences of the /18 students of the School of Sciences and Aerospace Studies of Moi University to determine the effectiveness of the industrial attachment in their courses. It gives the school management a collective baseline to gauge whether the industrial attachment meets the set curriculum objectives. In the light of the findings, there are practical recommendations meant to make the experience better and more worthy for the students.

Priscilla Njaguri

/18 Acturial Science Student

Moi University

ABSTRACT

Industrial attachment is a program that allows students to gain industry-based skills while they are yet to graduate. Tertiary institutions organize these programs at the end of third year or fourth year studies. In this study, a survey was designed to investigate the experience of the students of /18 students of the school of sciences and Aerospace Sciences of Moi University. These students undertook their industrial attachment in 2021. The population was clustered by the 7 majors offered at the campus. A sample size of 164 was selected randomly and allocated using probability proportional to size. A questionnaire with 14 questions was sent to the students via google forms. The data collected was analyzed quantitatively by use of summary statistics and visualizations in R and Tableau. The overall response rate was 52%. No imputations were made for missing data but rather, they were all dropped. 53% of the students reported to have experienced difficulty in securing an industrial attachment. Covid-19 was the greatest hinderance when it came to securing attachment while the time allocated for industrial attachment in 2021 was also detrimental for the students. 85.88% of the students were able to apply the knowledge they gained from classwork at the organizations they were attached while 97.53% of the students reported to have gained skills in relation of their majors. Financial challenges were the main challenges faced by students during their industrial attachment in 2021. The study recommended restructure of the school calendar to ensure that students are ready for industrial attachments by January, May or September as it align with most organizations' schedules. Future studies should seek to investigate the various associations between parameters.

ACKNOWLEDGEMENTS

Works in this survey were accomplished thanks to the efforts of the following individuals; Mr. Charles Mutai, Senior lecturer at the department of Mathematics Physics and Computing whose technical expertise were crucial in sampling and data analysis. Class representatives of the /18 cohorts of the School of Sciences and Aerospace Studies including; Erick Odhiambo (Applied Statistics), Steve Panyako (Actuarial Science), Kinama (Computer Science), Malika (Biochemistry) and Edwin (Microbiology).

Robert Kiage a consultant who works with various non-governmental organizations to install and manage monitoring and evaluation systems. His insights were significant in the drafting of the survey questionnaire.

Further acknowledgements to Priscilla Njaguri for her editorial to the final report and Nelson Vundi for his review on the final documentation of the report.

TABLE OF CONTENTS

FOREWORD	i
ABSTRACT	ii
ACKNOWLEDGEMENTS	iii
LIST OF FIGURES	v
LIST OF TABLES	vi
LIST OF ABBREVIATIONS	vii
INTRODUCTION	1
Justification of the Survey	1
Objectives	1
Assumptions in the Survey	2
Challenges	2
Data Ethical Concerns	2
SURVEY ORGANIZATION	3
The Population	3
The Sample	3
Data Collection Techniques	4
Data Analysis	4
RESULTS AND DISCUSSION	5
Sample Distribution	5
The Attachment Program	5
Students Views on the Overall Attachment Experience	8
Overall Attachment Experience	8
Securing the attachment	8
Skills Gained with Respect to Course	9
Challenges Experienced	10
CONCLUSION	11
RECCOMENDATIONS	12
REFERENCES	13
APPENDIX	l

LIST OF FIGURES

Figure 1: Sample Distribution by Course and Sex.....	5
Figure 2: Students who underwent attachment filled by course	6
Figure 3: Assessment within stipulated time	6
Figure 4: Duration, Classwork Application and Ratio for the /18 Students who Underwent their Industrial Attachment.	7
Figure 5: Difficulty in Securing Attachment	8
Figure 6: Attachment experience among the students.....	9
Figure 7: Challenges experienced by the students	10

LIST OF TABLES

Table 1: Student Population for /18 Cohort 3
Table 2: Sample Allocation per Cluster 4

LIST OF ABBREVIATIONS

ACS- Actuarial Science

AST- Applied Statistics with Computing

BCM- Biochemistry

BSE- Bachelor of Science with Education

BSC- Bachelor of Science

COM- Computer Science

MIC- Microbiology

INTRODUCTION

Industrial attachment is a program devised to equip students with relevant skills and knowledge about potential employers in the future. Muthoni, D., Gunga, S., Mutahi, I., & Origa, J. (2018) explained industrial attachment as being a key imperative for instructors who train in technical disciplines program is undertaken at the end of the third year of students' academic studies.

Numerous studies have echoed the significance of industrial attachment in the increase in efficiency of knowledge transfer. (Bansal et al, 2010) defined industrial attachment as one of the essential requirements of any learning institution. Industrial Attachment has become an important element of training as employers continue to demand for fully trained students because it is a platform to assimilate theory into practice (Matamande et al, 2013).

University departments organize these programs mostly after the third year though some undertake the program after completion of the four years academic studies. In Moi university, the program is undertaken at the end of the third year of students' academic studies. Students are attached to several industries based on their majors. The process involves students identifying industries in locations they feel they can best operate from but the university sometimes restricts to certain regions depending on the availability of lecturers as well as other factors such as security. The school only offers a recommendation and insurance cover. Apart from students pursuing educational courses; i.e., Bachelor of Science with Education, Bachelor of Arts in Education or Bachelor of Education, students from other programs primarily secure their attachments all by themselves.

The university recommends at least a 12-week period for the industrial attachment. Assessment is done after the 8th week.

Significance of the program has been echoed by many and will in no doubt drop in the coming years. The program is so significant in Moi university that it carries as much as 10 credits.

This study was carried out to investigate the overall experience of the program with the target group being /18 students of the School of Sciences and Aerospace Sciences. A cross sectional survey was designed to collect the views from the students who were divided into 6 clusters as per their courses. The survey was undertaken between September 2021 and November 2021.

Justification of the Survey.

As mention earlier, the program is really significant and carries a lot of credits. The survey sought to find out ways in which the program can be improved ensuring it continues to serve its purpose.

The survey also sought to form a platform on which future studies can be made.

Objectives

1. To investigate the number of students who went for industrial attachment during the stipulated time.
2. To investigate the average number of weeks that students undertake their attachment.
3. To identify some of the challenges that students undergo during their attachment.

Assumptions in the Survey

1. Each member of the survey of the population underwent industrial attachment
2. Every member of the population could be reached when needed.
3. The respondent rate could be at least 60%.

Challenges

Part of the sampling frame took a lot time to obtain.

Data Ethical Concerns

Participants were informed of the process to obtain consent for any data they would have shared. No personal data was collected. All data collected from the survey was used only for academic purposes.

SURVEY ORGANIZATION

The Population

The population consisted of 407 individuals. These are /18 students of the School of Science and Aerospace Science. The population is then divided into 7 groups; programs offered within the faculty. These are:

Table 1: Student Population for /18 Cohort

Course	Initials	Size
Actuarial Science	ACS	28
Applied Statistics with Computing	AST	58
Bachelor of Science	BSC	124
Bachelor of Science with Education	BSE	123
Biochemistry	BCM	22
Computer Science	COM	26
Microbiology	MIC	26
		407

The population was homogeneous within the group and therefore stratified and cluster sampling were good techniques to be used. However, we settled on cluster sampling due to the following reasons;

1. There was no reliable sampling frame of all individuals in the population.
2. Of the available sample frame, some of the members could not be reached.

Of the 7 initial clusters, 6 of them had a good list available and accessible. For this reason, we decided to drop the BSC cluster from the population and recalculated the sample size from a new population of 244 individuals. Another reason the BSC group was dropped was because most of the students in this cohort did not undergo industrial attachment and would have skewed the data.

The Sample

The sample size for the survey was computed using the Cochran's Formula.

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where:

n₀ is the sample size

Z is the Z-Score value for the desired confidence level; 95%

p is the proportion of the population of the desired traits set at 0.5

q is 1-p

e is the error level set at 5%

Adjustments for small population sizes is made using the formula below

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

The desired sample size was derived as follows;

$$n_0 = \frac{0.95^2 * 0.5 * 0.5}{0.05^2} = 384.16 \approx 385$$

Adjusting for small population size

$$n = \frac{385}{1 + \frac{(385 - 1)}{283}} = 163.35 \approx 164$$

The samples were allocated to the clusters using proportional allocation as shown in table 2 below.

Table 2: Sample Allocation per Cluster

Course	Initials	Size	Proportion	Sample Size
Actuarial Science	ACS	28	0.0989	16
Applied Statistics with Computing	AST	58	0.2049	34
Bachelor of Science with Education	BSE	123	0.4346	71
Biochemistry	BCM	22	0.0777	13
Computer Science	COM	26	0.09187	15
Microbiology	MIC	26	0.09187	15
		283		164

The final sample per cluster was generated randomly using Ms. Excel where each individual was assigned a unique key. Random numbers of the given sample size were generated within the cluster size and samples whose keys matched the random numbers were selected.

Data Collection Techniques

Data collection was done by use of a questionnaire. The questionnaire consisted of 11 questions that took approximately 5-10 mins to be filled. The questionnaire was created on Google forms and therefore data collected needed less coding thus saved a lot of time.

Data Analysis

Data analysis was majorly exploratory data analysis. Visualizations and summary statistics were generated using R and Tableau. No imputations were made for the missing data, rather they were all dropped irrespective of the question.

RESULTS AND DISCUSSION

Sample Distribution

86 respondents participated in the survey. This was a 52% response rate. 28 were female while 58 were male. AST had the highest response rate with 30 which was 88.23% of the sample units generated for that cluster while BSE cluster had the lowest response rate with 17 (23.94%). The distribution is shown in figure 1 below

Sample Distribution

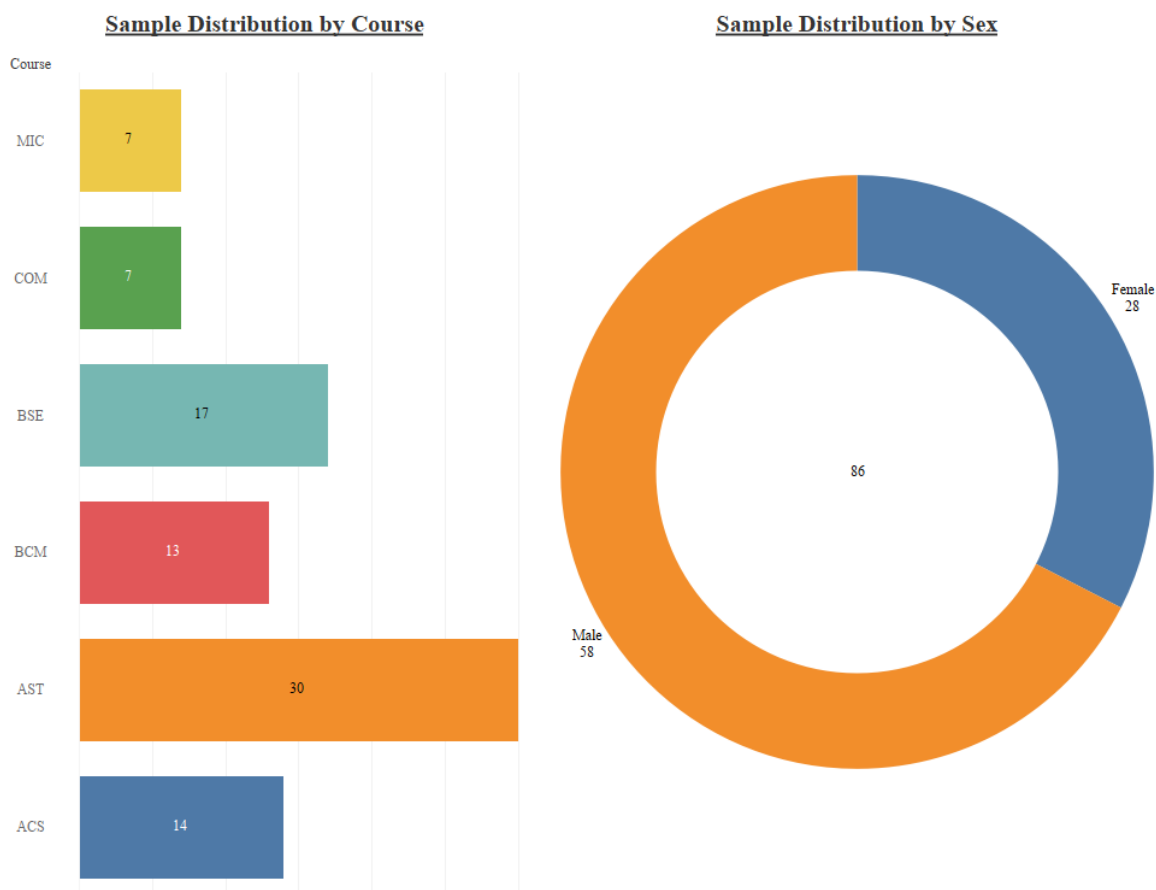


Figure 1: Sample Distribution by Course and Sex

The Attachment Program

95.4% of the students underwent their attachment within the stipulated time. This is a positive result since it indicates that majority of the students did not have to pay additional for insurance. The school undertakes an insurance cover for all students who undergo attachment within the stipulated period. However, if a student fails to undergo industrial attachment within that period, he or she has to take a personal cover as required by the organization.

Of all the clusters, only Biochemistry reported students not undergoing attachment within the stipulated time with 4 students as shown in figure 2.

83.2% of the students had at least 3 months of industrial attachment experience.

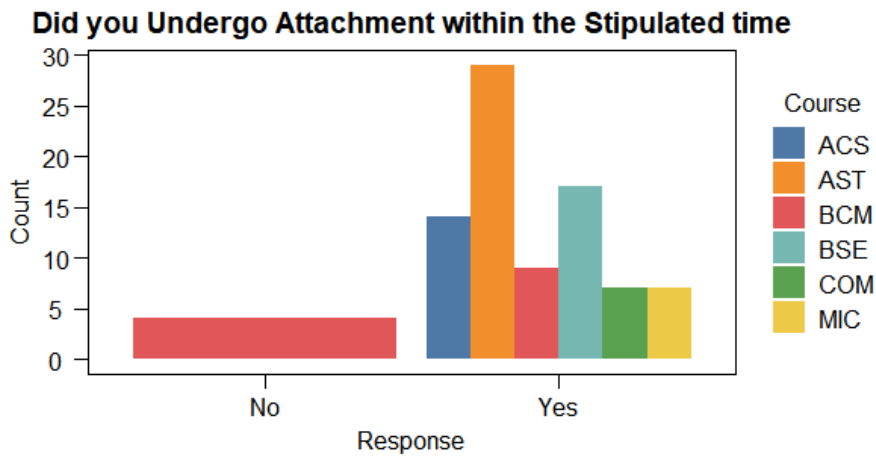


Figure 2: Students who underwent attachment filled by course

85 students offered responses on their assessment time by the school-based supervisor. The recommended time for assessment is at week 8. However, on some occasions some adjustments are made to cater for students who have shorter attachment periods. 75.29% of the students reported to have been assessed on time. Some of the reasons stated for late assessment were Covid-19 and fixed timelines of the university supervisors. AST, ACS and BCM cohorts had students who were not assessed within the stipulated time as shown in figure 3 below.

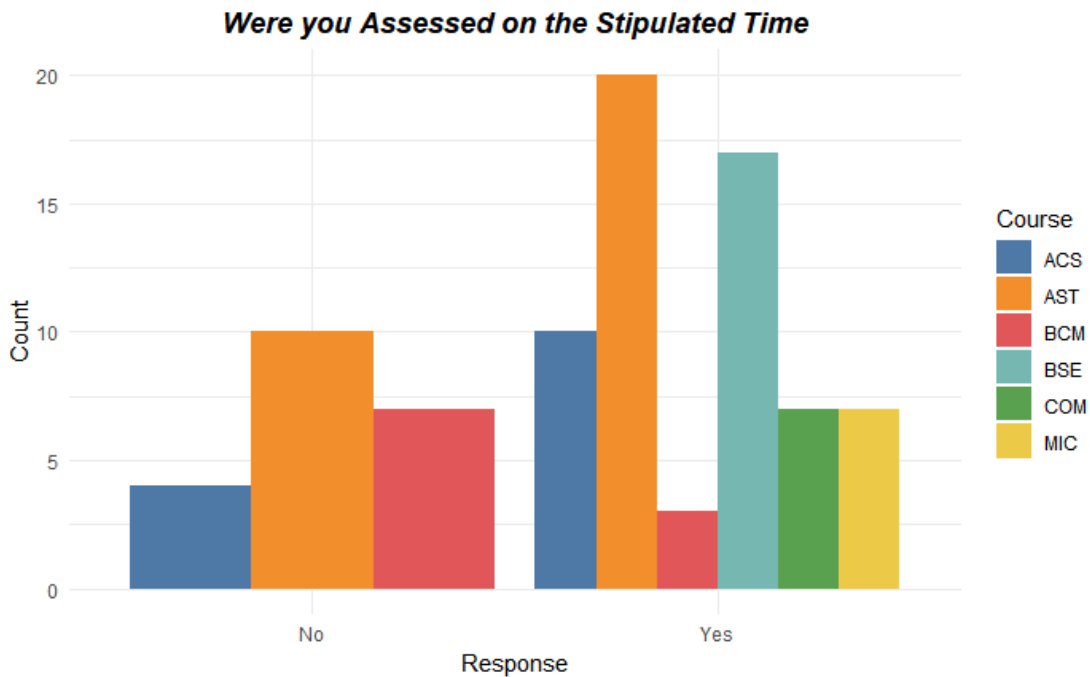


Figure 3: Assessment within stipulated time

On application of classwork in the industrial attachment, 85.88% of the students reported to have been able to apply most of what they learnt in class. This implies that the students who find industrial attachment places within their academic niche is above the 85th percentile. It further means that the respective departments in the school of Sciences and Aerospace Sciences have done a good job in designing their curriculums in line with what is required in the job market.

Figure 4 below shows summary visualizations for the overall program for the /18 cohort.

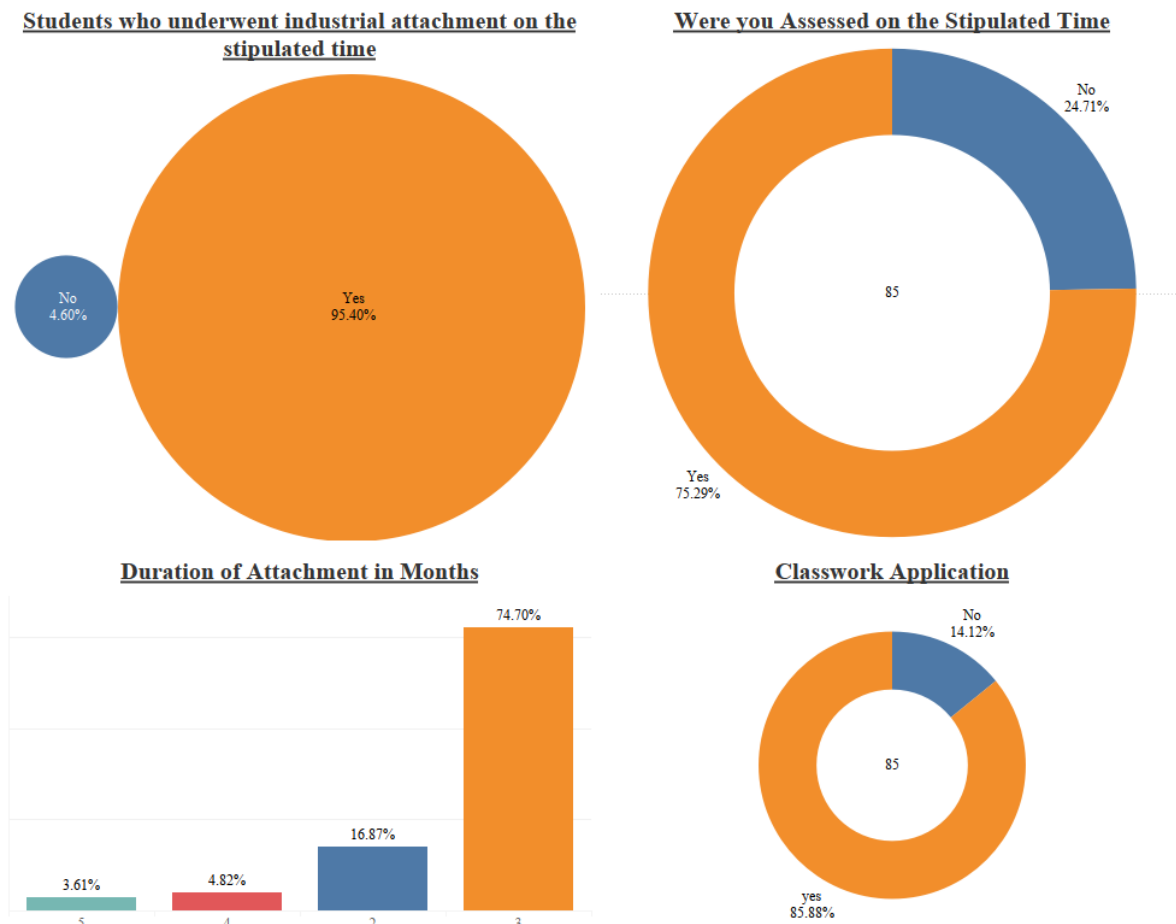


Figure 4: Duration, Classwork Application and Ratio for the /18 Students who Underwent their Industrial Attachment.

Students Views on the Overall Attachment Experience

Overall Attachment Experience

43 students had a good experience, 14 had a fair experience and 27 had an excellent attachment experience.

Securing the attachment

20 students found it difficult to secure an industrial attachment. 24 found it very difficult. Only 1 respondent found it easy and was from the BSE cluster as shown in figure 5 below.

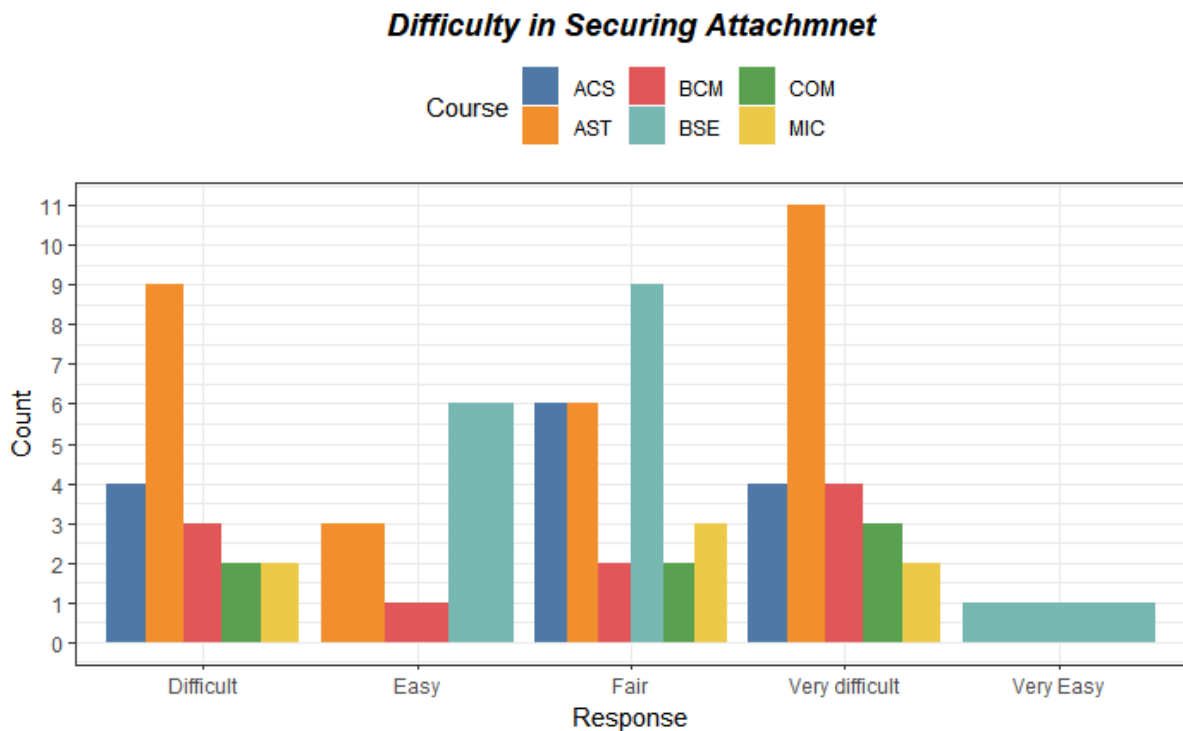


Figure 5: Difficulty in Securing Attachment

BSE students usually have their attachments as teaching practice where they get placed into secondary schools by the university. On average, the students do not have to toil to secure attachment as figure 5 above. BSE cluster are distributed between the levels fair, easy and very easy.

Some of the reasons that caused the majority (58.66%) to find it difficult to secure an attachment were;

- Covid-19. With the pandemic at the its 3rd wave, most companies were having their staff work from home while other were cutting down their human resource and therefore was difficult to accommodate students.
- The period that was prescribed. Most attachment opportunities are open in January, May or September yet the school sent students on attachment on the end of June

Skills Gained with Respect to Course

On the level of skills gained with respect to what the students gained during their attachment experience, 97.53% of the students reported to have gained skills in relation of what they study. 22 found it totally related, 31 found it somehow related, 26 found it average and 4 gained minimal skills.

Some of the skills gained by the students were; professionalism, communication skills, public relations, customer service, computer skills, leadership, presentation and management skills.

AST, ACS and COM cohorts on the majority gained skills on data analysis. COM students gained skills on data recovery and networking while ACS students majorly gained skills in financial management and insurance.

BCM and MIC students gained skills in laboratory test procedures and industrial procedures. BSE students reported to have gained skills in curriculum development and behavioural psychology.

Figure 6 below summarizes the overall attachment experience for all the students.

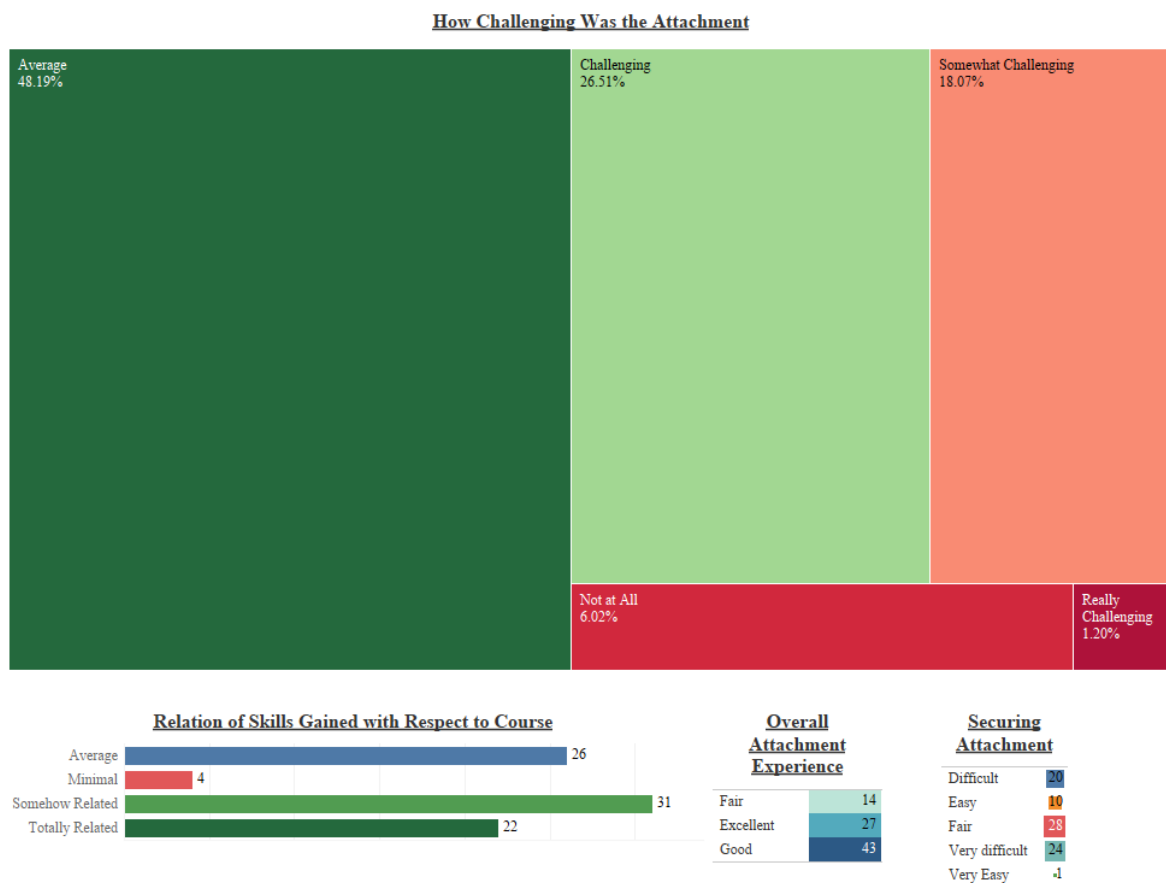


Figure 6: Attachment experience among the students.

Challenges Experienced

1.20% of the students reported to have a really challenging experience, 18.07% found it somewhat challenging, 26.51% found it challenging, 48.19% had an average experience while 6.02% did not find it challenging at all.

Of the challenges and problems experienced by students, **finance and Covid-19** were the most prevalent. Industrial Attachees rarely receive stipends to help them manage their experience yet most of them get attached in completely new environments. Covid-19 made it difficult for most students to secure an attachment and even when they got one, working from home limited the level of skills one could get. Accommodation and transport problems were also prevalent among most students.

Perhaps the most peculiar challenge was **Ingratitude**. Some students reported that they were being unappreciated yet they were tasked with huge workloads. Additionally, students reported to be mistreated by staffs and especially BSE students who were being disregarded by TSC employed teachers. Some students reported to be homesick since they were far from family and friends. BSE students further reported cases of indiscipline among high school students to the extent of them being bullied due to their inexperience.

Organizational protocols were seemed as a challenge among some students more so for ACS, COM and AST cohorts. These protocols restricted the staff handing over access to equipment and workloads to students.

Weather and environmental conditions of some locations were too severe for some students. Some students reported that they were in work environments that did not align with their passions or even their academic majors and therefore struggled to adapt. Gender discrimination was also reported as a challenge among some students.

Figure 7 below is a word cloud illustrating some of the challenges the students faced



Figure 7: Challenges experienced by the students

CONCLUSION

The survey was a huge success and though major timelines were not met; the objectives were realised.

Industrial attachment remains to be undoubtedly significant when it comes to skills transfer to students. The survey studied the overall experience among the 18 students of the school of Sciences and Aerospace Studies to investigate their overall experience of the program.

A random sample of students drawn from this cohort were handed a questionnaire to fill and their views were collected and analysed. Majority reported to have found it difficult in securing an attachment due to Covid-19 and the time period prescribed by the university which clearly differed to what the industry stipulates. Assessment by the university supervisors were done to all students though 24% reported that they were not assessed on time.

Among the positive feedbacks was that majority of the students (85%) were able to apply their classwork during their industrial attachment with 97% of the students reported to have gained skills that were related to their majors.

Financial constraints and Covid-19 were the most prevent challenges that the students faced during their industrial attachment.

RECCOMENDATIONS

These recommendations were collected from the students on the university could improve the program. These views are not ordinal in nature and all carry significant effect.

1. The school restructure semester dates in a such a way that it allows students to undertake industrial attachments in January, May or September.
2. The school should update their list of organizations in which they recommend students to apply for industrial attachment where they will be most relevant.
3. Assessments should be done regularly not only physical but continuous systematic check-ins.
4. The school should diversify the curriculum to add significant units to the syllabus such that students are well equipped for the industrial attachment. AST and ACS students recommended additional data analysis courses.
5. Since BSE students can only go for their attachments on first and second terms of the high school calendar, the school should consider post attachment so as to not inconvenience the other cohorts. It is unfair that the other groups are made to wait longer so as to just be at par with the BSE group.
6. Marks should be uploaded on time so as to allow timely and up to date generation of transcripts.
7. More teaching practice for the BSE group.
8. Increased emphasis on laboratory practical for BCM and MIC to widen their scope on the available standard operating procedures, equipment handling and even biosafety levels 2 and 3.
9. Follow up once students return for 4.1.
10. The school should arrange for ACS students to be attached at headquarters of insurance companies where they can maximize their learning experience.
11. AST students advocated for projects and practical sessions for units such as sampling, design of experiments and regression.

REFERENCES

Muthoni, D., Gunga, S., Mutahi, I., & Origa, J. (2018). Influence of Industrial Attachment on the Competence of Instructors and Students in Enabling Creative Innovations for Industrialisation in Kenya. *Msingi Journal*, 1(1), 72-103. <https://doi.org/10.33886/mj.v1i1.56>

Bansal, V. K., Grover, S. and Ashok, K. (2010). Feedback on students industrial training for enhancing engineering education quality: a survey-based analysis, *International Journal of Engineering Science and Technology*, 2 (9), 4807- 4816.

Matamande, W., Nyikahadzoi, L., Taderera, E. and Mandimika, E. (2013). An investigation of the effectiveness of work-related learning: A case of the industrial attachment program offered by the faculty of commerce, University of Zimbabwe. *Journal of Instructional Pedagogies*, 12

Kiplagat, H., Wanjiku, J., & Karei, R. (2018, August 28). Navigating the Maze: Finding Placement for Industrial Attachment. *African Journal of Education, Science and Technology*, 1(3), pp 106-110. Retrieved from <https://ajest.info/index.php/ajest/article/view/198>

APPENDIX

Questionnaire

Hello, you have been chosen to participate in this survey. This survey is being conducted by students of Applied Statistics with Computing in conjunction with the School of Science and Aerospace Studies. The survey seeks to examine the general experience of the industrial attachment and brief the school with necessary ways on how to improve the program. Please respond truthfully and fill as many questions as possible. The survey takes a maximum of 5 mins and no personal information will be shared or used without your consent.

1. What is your Course?

ACS

AST

BCM

MIC

BSE

BSC

COM

2. Sex

Male

Female

3. Did you go for your attachment within the stipulated time?

Yes

No

4. How long (in months) was your attachment period?

2

3

4

5

5. Were you assessed on the stipulated time?

Yes

No

6. How would you describe the attachment experience?
(Please select a number between 1 and 5. 1 representing Poor while 5 representing Excellent)
- 1 – Very Poor
- 2 - Poor
- 3 - Fair
- 4 - Good
- 5 – Excellent
7. How would you describe the skills gained in relation to your course/industry?
(Please select a number between 1 and 5. 1 representing None while 5 representing Totally Related)
- 1 – Not Related
- 2 - Minimal
- 3 – Average
- 4 – Somehow Related
- 5 – Totally Related
8. Did you apply the knowledge that was taught in class in your industrial attachment?
 Yes
 No
9. Describe skills /experiences gained during your industrial attachment?
10. How difficult was it to find industrial attachment?
(Please select a number between 1 and 5. 1 representing Very Difficult while 5 representing Very Easy)
- 1 – Very Difficult
- 2 - Difficult
- 3 – Fair
- 4 – Easy
- 5 – Very Easy
11. How challenging was the attachment?
(Please select a number between 1 and 5. 1 representing Not at All while 5 representing Very Challenging)
- 1 – Not at All
- 2 – Somewhat Challenging
- 3 – Average
- 4 – Challenging
- 5 – Really Challenging

12. Do you believe the attachment programme was effective?

Yes
No

13. Describe some of the challenges faced during the attachment period?

14. Suggest/Recommend on how we can improve the programme?