

## INDUSTRY-ACADEMIA COLLABORATION: MEETING UNDERGRADUATE ENGINEERS' EMPLOYMENT NEEDS

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### Abstract

**Purpose of the study:** The aim of this study is to investigate undergraduate engineers' perceptions on the industrial collaboration program.

**Methodology:** This study used both quantitative and qualitative methods of analysis. Based on purposive sampling, 150 undergraduate engineers were selected and were required to complete a questionnaire and participate in focus group interviews. Numerical data obtained using the questionnaire were tabulated based on frequencies and percentages. Thematic analysis was performed to identify patterns that emerged from the focus group interview transcripts.

**Main findings:** Study findings indicate a positive trend in students' perceptions on the benefits of the program besides indicating a gap in their ability and competency. Thematic analysis based on the focus group interviews reveal three emerging themes which indicate that the respondents found the program to have boosted their confidence, besides being useful and meaningful.

**Applications of this study:** This study contributes to the design of English for Specific Purposes (ESP) curriculum, specifically for engineers. ESP curriculum design as well as teaching and learning should include industry leaders' intervention.

**Novelty/Originality of this study:** This study will be the entry point for employer engagement in teaching and learning as well as in ESP curriculum development for engineers in the context of a technical university.

**Keywords:** Industry-Academia, Collaboration, Undergraduate Engineers, Job Interviews, Employment Needs

### INTRODUCTION

The challenging and shifting macro-economic trends in today's business environment have resulted in labor markets that are competitive and diverse; thereby, causing an increase in graduate unemployment. Concurrent with this move, employers seek graduates who have the ability to work flexibly and intelligently in the global, multi-disciplinary marketplace. Graduates' lack of readiness for the workplace has indeed become a global phenomenon today. Succinctly, [Lowden et al. \(2011\)](#) stressed on the need for the graduates of today to demonstrate a broad range of employability skills which include communication, team-work, critical thinking, problem-solving, leadership and managerial abilities. A graduate employability survey conducted by TalentCorp in collaboration with the World Bank posits on industry's demand for 'talent' in the undergraduates. In contrary, most undergraduates of today lack the required talent. The mismatch of skills among the undergraduates remain to be one of the top business challenges today ([Malaysian Economic Monitor, 2014](#)).

As in the engineering context, the [American Society for Engineering Education \(2012\)](#) developed a list of desired attributes that engineers need to be equipped so as to enable them to work in a global context. Out of the 20 attributes that were developed, two attributes include the ability to communicate in a variety of ways, methods and media, and the ability to communicate effectively to both technical and non-technical audience; thereby, emphasizing the importance of effective communication skills.

Yet another noteworthy observation made by the employers is that one of the reasons for graduates' failure to secure employment is their lack of confidence in communicating and marketing themselves during the formal interview. There is ample evidence suggesting that recruitment of graduates today is increasingly more complex and critical in comparison to the past. This is because the selection procedures are based on graduates who are perfectly 'work ready' and who are 'best fit' for the workplace. Moreover, [Basri et al. \(2012\)](#) asserted that graduate unemployment is due to the fact that the graduates lack the capability of securing a job. All the above-mentioned issues pose the formidable challenges faced by

the undergraduates. Various researches have stressed on the urgency for the higher learning institutions to bridge the gap between academia and work by engaging with the industry (Pillai, 2009). Hence, this current profound divide between the world of academia and the workplace and the issues related to industry-academia collaboration has led to this research.

## LITERATURE REVIEW

TalentCorp has taken the initiative to collaborate with the Ministry of Higher Education (MOHE) on the Industry-Academia Collaboration (IAC). This initiative has brought leading employers from industries to work with Malaysian universities with the aim of bridging the gap between the graduates and the demands of the industries (Malaysian Economic Monitor, 2014). Job interviews which assess the competence and suitability of candidates' responses is a strategic conversation between an interviewer and an interviewee. Besides, it is an important genre that is widely used in workplace settings (Jiang, 2013). On a positive note, Jiang (2013) envisages that job interviews assist employers to evaluate and judge potential employees in terms of professional skills, communicative abilities, language proficiency, work experiences, team-working and leadership abilities. On the other hand, the interviewee is said to be mandated with the role of persuading the employer that he or she has the skills, background and the ability to do the job as well as comfortably fit into the working environment.

Ironically, securing a job through an interview has been considered a hurdle and the most grueling process (Nancy, 1994). According to Omar et al. (2012), a high rate of graduate unemployment in the Malaysian context is due to the presence of a high number of graduates who lack the required skills to acquire jobs. Wading into the literature, it has been proven that graduates fail to impress the employers at the interview stage and a quarter do not know how to create a good impression (LearnDirect, 2012). Wilkins and Stevens (2001) stress that graduates most often do not have the job-seeking skills required to gain entry into the profession that they yearn for. A study by Atkinson and Pennington (2012) reports the reasons for the unemployment of graduates. In this study, more than half of the unemployed graduates revealed that they find it difficult to answer competency-based interview questions. Besides, the employers who were interviewed revealed some of the common reasons for rejecting the job applicants. These include using poor or inappropriate techniques for answering questions during job interviews, being too quiet or too dominant in group interviews, low confidence and inability to project themselves in an interview. Hence, this study advocates on the importance of identifying potential mechanisms to improve graduates' interaction with employers.

Coll and Lay (2001) stress on the importance of providing job interview practice to undergraduates at the university level. This is because Coll and Lay (2001) believe that this kind of exposure enables the undergraduates to gain an understanding on the types of questions that they would encounter as well as enable them to practice articulating suitable answers to job interview questions. Elicker (2012) voices his concern on the necessity for the undergraduates of today to have well-honed interview skills as it can make a difference between winning and losing job opportunities.

Higher Learning Institutions (HLIs) play an important role in addressing this issue. They are armed with a mandate to equip undergraduates with interview winning skills and strategies. This is due to the fact that performing well in a job interview is one of the most important steps in securing a job. In lieu of this, HLIs play a significant role in reducing the skills gap through improvements in curriculum and teaching methods. Along these lines, Singh and Charan (2008), postulate that reports issued by employers have put HLIs under intense pressure of equipping undergraduates with the 'key', employable or generic skills and thus it is crucial and timely to have working relationships with industries. It is apparent that this would enable them to meet the requirements and needs of the employers. Baharun and Ebi (2009) too intrinsically pontificate on the issue of 'marketable' graduates to help HLIs gain a competitive advantage and thus they purport on the importance of HLIs to develop partnerships with industries. Stressing on the importance of university-industry collaboration, which would enable both academia and industry to realize benefits that each can offer.

Industry-academia collaboration has been a key emphasis in the world's Higher Education policy in recent years (Jensen, 2011) and providing industries with a meaningful role in assessment and training is crucial (Chamadia & Shahid, 2018). At present, the subject of industry-academia collaboration is increasingly scrutinized and is highlighted by governments and scholars globally. According to Dasgupta (2017), universities need to collaborate with industries and tailor their courses such that they are aligned to the requirements of the industry. Abbas et al. (2018) stress on collaboration as a source of knowledge generation and the key role played by the government in supporting the agenda. Researchers keep stressing on the significance of industry collaboration in academia in terms of short term measures such as industry visits and long term measures that include upskilling of lecturers and updating the existing curriculum on (Malaysian

[Economic Monitor, 2014](#)) education and training ([Guimon, 2013](#)), developing skills, and enhancing knowledge exchange ([Ankrah & Al-Tabbaa, 2015](#)). This involves a range of arrangements such as temporary personnel exchanges ([Vega, 2017](#)) and the benefits that could be investigated by considering the nature of interactions and the results obtained ([Bellucci & Pennacchio, 2016](#)).

In the Malaysian context, the Malaysian Budget in 2015 ruled out on the necessity for public-private partnership via programs such as IAC. With the allocation by TalentCorp, universities, government entities and industries were encouraged to collaborate on the development of curriculum for HLIs ([TalentCorp Malaysia, 2016](#)). The [Malaysian Education Blueprint \(2015-2025\)](#) stresses on the importance of integrating and working collaboratively with industries. According to the blueprint, partnering between HLIs and industry will help to solve the most pressing challenges and develop cutting edge solutions. Thus, HLIs are encouraged to leverage on industries' readiness to participate in curriculum design and program delivery. When industries and universities work in tandem to push the frontiers of knowledge, they become a powerful engine for innovation and economic growth ([Edmondson, 2012](#)). Such partnerships help modernize curricula and foster the exchange of ideas; thereby, developing individuals with skills and competencies that are needed in line with new innovation that transforms markets and industries ([Edmondson, 2012](#)).

Inspired by a distillation of the literature as stated above, an Industrial Collaboration Program (ICP) was held by the Department of Languages, Centre for Languages and Human Development of Universiti Teknikal Malaysia Melaka with the aim of equipping the third-year undergraduates who are takers of the course on English for Professional Communication with skills and strategies to win interviews as well as to secure employment. In this context, industrial collaboration is used to refer to the university's collaboration with the industry whereby five employers from an industry in Melaka were invited to the campus to expose students to job-seeking strategies. The employers conducted mock interview sessions, discussed on interview selection criteria, how to portray a professional image as well as good communication skills and confidence. Besides, the students were also exposed to tips on writing cover letters and resumes thus enabling them to understand the real world relevance of their learning from the course on English for Professional Communication.

IAC is also high on the agenda in Australian higher education. In the Australian context, there is a huge emphasis on increasing industry's engagement in higher learning via the introduction of Work Integrated Learning (WIL) which focuses on improving the undergraduates' transition from university to the workplace as well as the productivity outcomes for employers ([Ferns et al., 2016](#)). Systematic and proactive measures have been taken to broaden the above-mentioned initiatives in Australian universities, especially in Science, Technology, Engineering and Mathematics (STEM) disciplines ([Edwards & McMillan, 2015](#)).

In Australia, a study was undertaken by four publicly-funded Western Australian universities in partnership with the Chamber of Commerce and Industry of Western Australia, thus focusing on the work placement of undergraduates. Findings of the study revealed that several issues such as concerns about students' performance and the capacity of mentors affected the undergraduates' engagement in WIL. Therefore, the study suggests that measures need to be taken to alleviate the barriers and challenges so as to enhance the sustained growth of the WIL experience ([Jackson et al., 2017](#)). A study by Gintelle (2015) espouse on students' opinion about course delivery by both industry professionals and academics as a more desirable way in course delivery. The English for Professional Communication subject which is also known by the code BLHW 3403 is a compulsory subject that is offered to the third and fourth year undergraduates to develop their oral communication as well as to enhance their level of English literacy which will be beneficial to their professional careers. They are equipped with the workplace communication skills. A needs analysis study conducted by [Indra Devi and Teh Zanariah \(2011\)](#) resulted in the design of this course based on the course takers' professional communication needs.

Based on the needs analysis, it is evident that the undergraduates require instruction in oral skills, primarily interpersonal communication and professional conversations in order to be able to communicate competently in workplace settings. Besides, 76.1% of the respondents in the needs analysis study revealed that responding and participating in job interviews was very important to them. This characterized their instrumental motivation to secure a good job in future. Consistent with this, [Brown \(2000\)](#) and [Redfield et al. \(2009\)](#) also indicated that second language learners, especially technical students, exhibit high instrumental motivation. Since, motivation is an important variable in second language acquisition, the learners' needs for exposure to job interviews were taken seriously, thus culminating in several endeavors such as the industrial collaboration project.

The study was aimed to obtain feedback from the undergraduates about the industrial collaboration program as well as to enable them to share their ideas on what they had learnt from the employers. The industrial collaboration program was held to expose the undergraduates to real-life interviews conducted by the employer as well as to learn some skills and strategies in relation to participating in interviews, writing cover letters and resumes.

## METHODOLOGY

A total of 1650 undergraduates from the Faculty of Electronics and Computer Engineering, Electrical Engineering, Mechanical Engineering, Manufacturing Engineering as well as undergraduates from the Faculty of Information and Communication Technology participated in the 5-day program which was held in several sessions. A total of thirty-two undergraduates participated as interviewees and they were interviewed by five employers from the industry.

From the net total of 1650 undergraduates, a total of 150 students from the Faculty of Electronics and Computer Engineering were required to complete a questionnaire after the program. Purposive sampling was used to select the samples whereby all of them had registered for the English for Professional Communication course. The respondents were in the third year of their studies. They had completed two levels of English Language courses in their previous semester and had acquired a certain level of proficiency (intermediate - upper intermediate) required for carrying out tasks and activities in the English for Professional classroom.

The questionnaire that they were required to complete investigated on their perceptions regarding the industrial collaboration program. The numerical data in the questionnaire were tabulated based on frequency and percentages. Three focus group interviews, with eight members in each group, were held with some of the respondents to retrieve information on the important tips that they had learnt from the employers as well as to obtain their feedback about the program. Interview data were transcribed and then analyzed for emerging themes. Thematic analysis was used as a method to identify meaningful patterns across the focus group interview transcripts. Patterns were identified through data familiarization and data coding until themes were developed.

## FINDINGS AND DISCUSSION

Analysis of data based on questionnaires indicated positive trends in students' perceptions on the benefits of the program. While 56.7% of the participants stated that their knowledge pertaining to attending interviews before attending the program was high and the percentage increased to 87.3% after attending the program. As for confidence level, 86.0% of the respondents had stated that their confidence had been high after attending the program as compared to 58.0% before attending the program. Besides, 88% of the respondents had stated that exposure to employer engagement in their course has been a positive, rich, motivational and meaningful experience and 74% of the respondents have the perception that employer engagement in classroom teaching and learning improves the quality of their learning experience. Another highlight of the finding is that 70.6% of the respondents have found a gap in their ability and competency in succeeding in a job interview in comparison to what is demanded by the employer. On the other hand, 79.7% of the respondents are of the opinion that the program was generally good.

The findings from the focus group interview indicate that the industrial collaboration program has been an eye opener to them as they had learnt lots of strategies in relation to writing resumes and winning interviews. Thematic analysis based on the focus group interview revealed three emerging themes. The first theme indicates that the respondents find the program to have boosted their confidence. They mentioned that they had learnt strategies and techniques in answering tricky questions as well as ways to avoid nervousness. Besides, they mentioned that the grooming and dressing tips had been useful and that they were more confident to face an interview. The second emerging theme includes usefulness of the program. The respondents expressed that they have been made aware of interviewers' expectations, the kind of answers that should be provided, the need to speak clearly, how to be a unique interviewee and how to avoid unreasonable, extraordinary or fake kind of answers. Generally, to them the program was found to be useful as they had a feeling that they were in a real interview-like scenario. The third emerging theme is 'meaningful'. They mentioned that the examples given by the employers have been very meaningful to them and that it had been a very valuable and meaningful experience. They hoped that more of such programs are held in future and that more employers from industries are invited. According to them, the sessions had been more interesting than the lectures and tutorials that they had in class.

Overall, the above findings provided clear evidence that the employer feedback had allowed the undergraduates to learn the necessary skills and strategies that are important in winning a job interview. In the focus-group interviews, all the

students provided positive feedback and requested for similar programs in future. The feedback that they had received from the employers were critical to improve their future performance in an interview situation. It would also help to build their communication skills in an interview setting. These findings concur with [O'Sullivan and Cochrane \(2009\)](#) who highlighted that employer collaboration in undergraduate projects provide students with great opportunities to be involved in rich, challenging and meaningful educational experiences. In line with this study, [Kaushal \(2016\)](#) too stresses on the fact that the four years of studies and degree acquisition is not a passport for employment and hence suggests that academia fill in the missing gaps by inviting stakeholders from the industry to prepare students with job readiness. The study bridges the gap by stressing on the importance of industry-academia collaboration where success stories and first-hand information shared directly by the employers have been very meaningful to the undergraduates.

## CONCLUSION

Employers' collaboration in classroom instruction is indeed very significant as experience sharing with industry enables the undergraduates to understand the requirements of the industry. This kind of experiential learning enhances their knowledge about winning job interviews, break down barriers between students and employers and enhance their networking with the employers. Employers' involvement in classroom activity also enriches the curriculum as it brings the curriculum to live besides improving students' motivation and retention. Despite the above-mentioned positive implications, several issues and challenges may impact the industry-academia agenda. This could be in terms of commitment, cooperation and rapid responsiveness among the stakeholders involved in the agenda. [Klosters \(2014\)](#) resonates on the stronger ownership and involvement required from the industries in terms of cooperation and handling of skills mismatches among the undergraduates. In such circumstances, the government can play a prominent role by leveraging the collaboration via the provision of incentives to industries which actively engage with universities.

Academia needs to move towards the quadruple helix of academia, industry, government and local communities and it is a fact that it cannot operate in isolation but needs to work together in partnership with the aforementioned entities ([Abdullah, 2014](#)). In conclusion, this study finds IAC in classroom activities as a comprehensive strategy and best practice as it promotes subject learning and has the potential to secure employment as well as develop soft skills. Hence, this study recommends that HLIs take the necessary measures to address the gap in the undergraduates' job seeking skills by collaborating with industries so as to meet undergraduates' employment needs.

## LIMITATION AND STUDY FORWARD

This study is limited to undergraduate engineers in a technical university in Melaka. Future studies should involve other fields of studies in the ESP domain and held at an extensive level that includes collaboration with employers across borders via real-time communication.

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