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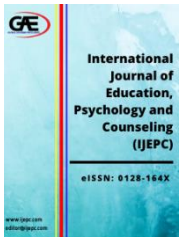

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STUDENT'S PERCEPTION ON UMS SCIENCE FOUNDATION PROGRAMME IN DEVELOPING THEIR KNOWLEDGE AND SKILLS FOR ENGINEERING COURSES

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Abstract:

Since its accreditation by MQA in 2018, the UMS Foundation in Science Program, through PPST has continuously produced high quality standards for students furthering their studies in UMS. Clinging to its accredited program means that quality assurance of foundation's teaching and learning will be maintained and monitored. Herein, this study reports the feedback given by the foundation program's alumni whose continue in undergraduate study of UMS Engineering. The objective is to investigate the students' perception on knowledge and skills they obtained throughout the foundation year in relation to their courses study. A questionnaire with open ended question was constructed through a google form and designed in accordance with the MQA program review and monitoring guideline with 4 Likert scale (1- strongly disagree, 2- disagree, 3-agree and 4-strongly agree). Among 35 student's replies, almost everyone answered high percentage of number 3 and 4, indicating an agreement towards knowledge and skills aspects. 100% student agree that the foundation program give them new knowledge and strengthen the basic theories in their engineering courses. Meanwhile, 94% believed that the foundation courses strengthen the personal skills, contribute to the achievement in engineering course and assist them to apply the skills obtained in foundation for lifelong learning. In open-ended questions, two themes of answers: (i) strength; (ii) hopes and expectations were organized, which highly in line with the students' feedback in the Likert scale scores. This is in accordance with the student agreement that Foundation in Science Programme

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of UMS does provide basic knowledge and skills that relevant to the Engineering course in UMS. Further suggestions received and changes to the programme in the new academic year will be continuously monitored and reviewed for academic quality assurance.

Keywords:

Engineering, Foundation Course, Knowledge, PPST, Student Perception

Introduction

The Science Foundation Programme of Universiti Malaysia Sabah (UMS) aims to produce students with solid fundamental knowledge in science and become the feeder for science-based undergraduate programs in UMS. This programme was conducted through Preparatory Centre for Science and Technology (PPST), UMS since 2010 and offered for about a year with two semesters to be completed (Preparatory Centre for Science and Technology, 2022). Entry requirement are passes in SPM/SPMV/O-level with minimum 5 credits including Malay and pass History subjects and at least graded C for Biology, Physics, Chemistry and Additional mathematics (PPST Entry Requirements, 2015). Within the period, students are to complete 18 subjects with general and core courses. The core subjects involve Mathematics, Physics, Biology and Chemistry while the general courses are Introduction to Information Technology, Analytical Thinking, Ethics in Science and English. The English subject particularly is to prepare student for Malaysian University English Test (MUET). The curriculum structure of Science Foundation Program was designated to has the qualification and skill in science that meets the requirement of degree courses provided by the faculties in UMS (PPST Profile, 2015). In 2018, the UMS Foundation in Science Program was accredited by Malaysian Qualifications Agency (MQA) (MQA/FA10897) (Malaysian Qualifications Register UMS, 2022).

Accreditation is a status or achievement and a formal recognition that a certificate, diploma or degree programme has attained the quality standards and criteria set by MQA and is in compliance with the Malaysian Quality Framework (MQF) (Malaysian Qualifications Register Accreditation, 2022). MQA has made a commitment that the programmes it has accredited are quality-assured to all parties involved in higher education, including students, parents, and employers. MQA accreditation status gives a lot of benefits. In addition to serving as a standard for quality programmes, it has the following advantages: students may apply for loans from funding organisations like the National Higher Education Fund (PTPTN); they may continue their education at institutions of higher learning and receive credit transfers; they may be considered for employment in the public sector; and, subject to certain restrictions, institutions may franchise their accredited programmes to other institutions (Malaysian Qualifications Register Accreditation, 2022). Aside those advantages, being accredited program also means that the quality assurance of teaching and learning of Science Foundation Program of UMS will continuously be maintained and monitored.

From here, the quality improvement can be achieved through feedback from stakeholder of the program such as the alumni. The ex-student of UMS Science foundation program will further their undergraduate studies in various science-based courses and continue applied the knowledge and skills gained during foundation period. Thus, it is important having response from alumni on the program for continual quality improvement (Malaysian Qualifications Agency, 2014). Study by Yograj et al. (2021) on perceptions of stakeholders regarding the

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foundation course on medical education shows that two thirds of the stakeholders (students, faculty members and administrative staff) rated their program as satisfying. The study also found out that most of the objectives of the program have been achieved in the form of short-term outcomes such as satisfied, interested in studying medicine and aware of their responsibility as a doctor. Another study on improving programme quality stated that feedback from student was a valuable tool to be adopted in the new academic year (Bardi & Muresan, 2012).

In this study, feedback from alumni of foundation in science programme from UMS Engineering students were selected. Therefore, the objective is to investigate the student perceptions on knowledge and skill they had obtained during foundation year in relation to the Engineering Degree courses in UMS.

Methodology

A questionnaire (quantitative) with open ended question (qualitative) was constructed through a google form and distributed to as many as possible UMS foundation in science alumni that continue study in UMS Engineering program. The questions were designed in accordance with the MQA program review and monitoring guideline (Malaysian Qualifications Agency, 2014) with 4 Likert scale (1- strongly disagree, 2- disagree, 3-agree and 4-strongly agree) and analysed using descriptive analysis. The questions were divided to knowledge (Q1-Q4) and skills (Q5-Q8) and the Cronbach's Alpha is 0.896 and 0.901 respectively. The open-ended question was asked at the end of the form in term of the program strengths, weaknesses, and suggestions.

Findings and Discussions

A total of 35 former UMS science foundation students that continue degree study in Engineering courses were voluntarily participated. Students' perception on knowledge (Q1-Q4) and skills (Q5-Q8) obtained during foundation study was depicted in Table 1. In most given questions with Likert scale answer choices (Q1-Q8), students have answered high percentage of number 3 and 4, indicating an agreement towards knowledge and skills aspects in the questions.

Table 1: Response From UMS Foundation In Science Alumni On The Knowledge And Skills

Statement	1	2	3	4	Mean	Std
Q1 - The courses give new knowledge	0%	0%	43%	57%	3.57	0.50
Q2 - The courses strengthen the basic theories in major field	0%	0%	46%	54%	3.54	0.51
Q3 - The courses improve the knowledge in major field	0%	3%	43%	54%	3.51	0.56
Q4- The courses improve the quality of learning in major field	0%	6%	37%	57%	3.51	0.61

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Q5- The courses give relevant and needed skills	0%	11%	37%	51%	3.40	0.69
Q6- The courses strengthen the personal skills in major field	0%	6%	43%	51%	3.46	0.61
Q7- The skills contribute to the achievement in major field	0%	6%	43%	51%	3.46	0.61
Q8- Apply the skills for lifelong learning	0%	6%	40%	54%	3.49	0.61

Figure 1 and 2 summarised the students' perception on the knowledge and skill respectively during the foundation year. The percentage of agree is the sum of item 3 and 4 of the Likert scale and disagree is from the additional percentage of Likert 1 and 2.

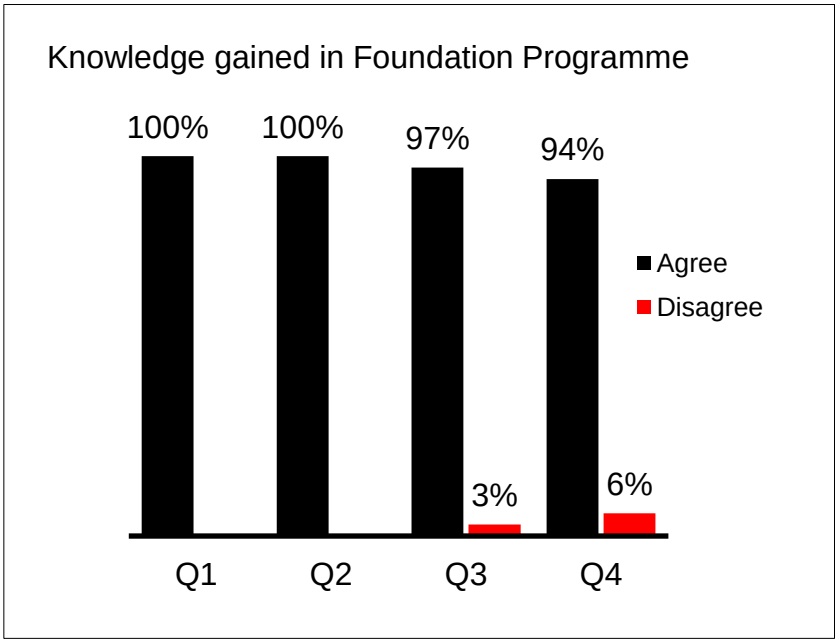

Figure 1: Students' Perception on The Knowledge

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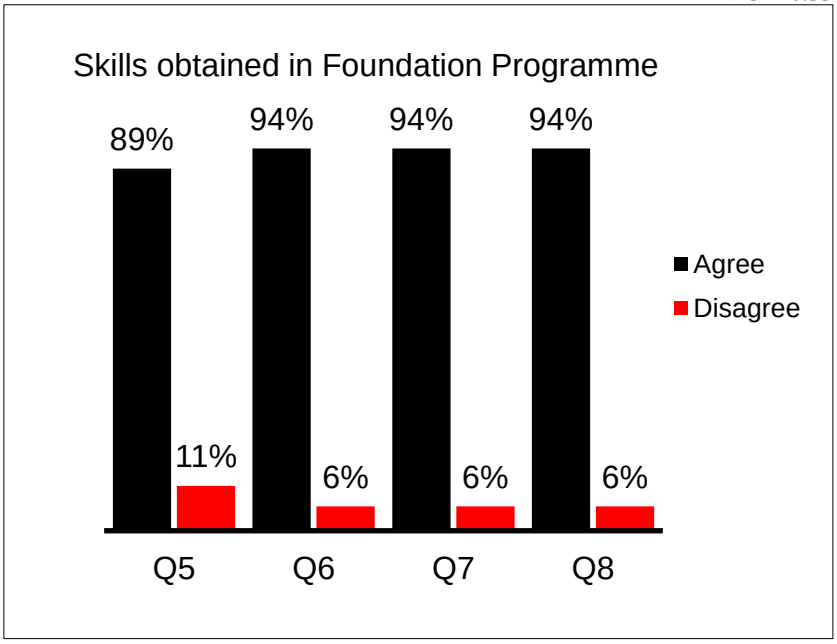

Figure 2: Students' Perception on The Skills

From Figure 1, the former UMS science foundation student 100% agreed that the programme give them new knowledge and strengthen the basic theories in their courses. In addition, the alumni agreed that UMS Foundation in Science has improve their knowledge and quality of learning for their degree course with 97% and 94% respectively. Meanwhile in Figure 2, 89% student agree that the UMS science foundation programme give relevant and needed skills for engineering courses. Meanwhile, 94% believed that the foundation courses strengthen the personal skills, contribute to the achievement in engineering course and assist them to apply the skills obtained in foundation for lifelong learning. Enhancement of knowledge and skills among student that participating foundation courses also has been presented elsewhere (Ooms et al., 2012; Gangwar et al., 2022; Bhatnagar & Oberoi, 2022). Major findings reported that student felt that the foundation programme was useful for their degree studies (Mittal et al., 2013).

Open-Ended Question

Most of the agreement from the alumni of the UMS Science foundation program for knowledge and skills are in line with their response for the open-ended questions. The findings from program strengths, weaknesses and suggestions were divided into theme and organised into categories as in Table 2.

Table 2: Theme and Categories

Theme	Categories
strengths	1. Train student to adapt undergraduate studies 2. Strengthen fundamental knowledge 3. Advance of the course in foundation program 4. Knowledgeable and supportive educator
hopes and expectations	1. Courses and Career prospects

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2. Teaching and learning facilities
3. Varieties of learning experience

Theme: Strengths

The alumni mentioned repeatedly the teaching and learning practices during UMS foundation programme similar to the undergraduate system that does help them to naturally adapt their freshman year particularly in conducting lab, preparing the lab report as well as the presentation. In the same time, the programme strengthen their basic knowledge on science stream subject for Biology, Physics, Chemistry and Mathematics that benefit them in degree course that they continue in. This is in line with the mission and vision of PPST that to become the epicentre of learning for undergraduate programme and be excel on teaching and learning method that combining both practical and theoretical in foundation towards established sustainable science and technology development (Preparatory Centre for Science and Technology, 2022). Feedback from strength theme also supports the questionnaire response in Figure 1 and 2.

Train Student To Adapt Undergraduate Studies

(S1) *Provide knowledge on how to make assignments, PBL reports that similar to degree.*

(S6) *Teaches Discipline/Lifestyle of an undergrad*

(S22) *Based on my experience, it is easier for me to write a report writing as the basic I have during Foundation helps me a lot especially with the content of the report. I like it when the tutor and lecturer show us what is our mistake in writing and what can we do to improve our report writing. The PBL session helps the student to apply their theory with real situation. This session also helps us to be confident and stand with your answer by providing our own relevant thought. Student will be able to think creatively which helps student during their degree stage. Most of the student from foundation of science in UMS excel in their presentation during Degree because they are confident and are not afraid to argue with the lecturer.*

(S35) *Introduced on how to make reports and increase knowledge on it*

Strengthen Fundamental Knowledge

(S5) *It was great. The courses give skills & knowledge for my recent course.*

(S23) *I learnt so much within 1 years and all the lecturers are supportive. The course during the asasi is helpful including all the elective subject such as pengajian Malaysia .*

(S28) *Broad area of study especially in science field. All basic knowledge which was required during degree study were taught properly during foundation.*

*(*S29) *Basic knowledge for every science courses*

(S30) *Good basic on reports*

Advance Of The Course In Foundation Program

(S2) *Very advance that some of the subjects in degree level are already been studied during foundation*

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(S10) *Provide environment alike degree program so student can become more familiar with how the study environment will be.*

(S12) *Suitable for admission to the degree programme*

In line with knowledge and skills obtained, the role of teacher should not be neglected. A crucial quality that promoted learning to be effective in the classroom was the enthusiasm of the lecturers (Keelson, 2011). The foundation students were basically a school leaver, and their age are mostly 18 years old. When entering university, this is a transition phase for them adjusting study life and adult livelihood where they should be guided to be an independent learner. In PPST, blended learning approach were being practiced for science foundation program (Matawali et al., 2019; Eldy et al., 2019; Din et al., 2020) which combines face-to-face instruction and self-directed learning as well as encouraging e-learning platform (Che Hussin et al., 2021; Juhan et al., 2021). From here, interaction in classroom activity that involve active learning quite an important aspect between student and educator. According to Bardi & Muresan (2014), encouraging interaction among participants is indeed the brilliant way to organize classroom activity. Students and tutors are participants in the learning process, and both can learn from one another.

Knowledgeable And Supportive Educator

(S8) *Very direct courses and subjects, strong background of educator line up, made us the successful human now.*

(S9) *Commitment and bond of lecturer with students*

(S20) *Superb lecturers (Brilliant, caring, kind, funny)*

(S22) *The way lecturer conduct lecture and tutor are more and less the same with degree's lecturer which make us easy to adapt with the learning session during Degree.*

(S23) *I learnt so much within 1 years and all the lecturers are supportive.*

(S26) *Excellent lecturers, lecture notes given were informative and straight to the point, tutorial classes and lab sessions according to syllabus*

Theme: Hopes And Expectations

In this theme, more than half of the respondent answer no/none for the weakness and the weakness are somehow used as the suggestions. Thus, this hopes and expectations theme is come from the weakness and suggestion part of the questionnaire. For courses and career prospects category, the UMS Engineering alumni of Science foundation programme suggest more interactive career exposure and hands-on. In PPST, students were exposed to course choices to be chosen after foundation years during the final semester. A series of talk from faculties were given and selected site visit were conducted. Some undergraduate programme even offers one-on-one talk on their course to UMS foundation student to elucidate more on their course and for promotion purpose. During the talk series, some programme inviting their student which was former UMS foundation student to share their experience in that course.

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Courses and Career Prospects

(S6) *Most students in Foundation courses, at most, may have a vague idea of what are the job scope and responsibilities of someone working as an Engineer, a Chemist, or a Doctor etc. I believe Foundation course is the best time to truly expose and show students of what work life would be like as accordance to field they choose to pursue after Foundation. Perhaps instead of holding a "Career Carnival" or like something of that matter, we should orchestrate a proper, and informative, "site visit" or short 3-day program to show what different types of field do in work life. Maybe its best to start this by grouping the students according to the Faculty they are interested in.*

(S22) *Make a sharing session with the alumni from different course. So, students will able to ask anything about the courses they are interested. This is because, alumni knows better what happen and the relation between foundation and their courses.*

Another important aspect to be addressed in this category is offering programming subject. Particularly from Electrical and Electronic Engineering course, the alumni mentioned several times the importance to have basic knowledge on this matter. In line with suggestion from respondent (S3) on the subject UT0012: Introduction to Information Technology that suggested to be revised, basic programming could be recommended to be included through that subject.

(S3) *ICT course can be improved*

(S10) *Program such Electrical and Electronic require knowledge such as programming so maybe can teach some of the basic during asasi or foundation*

(S29) Hope there will be some programming subject in the future because there a few courses need to learn programming especially engineering course

(S33)*Offer computer science/programming/coding/basic electronics/robotics based subjects to allow easier transition of Asasi students to computer focused degree programs.*

The following categories that belong in this theme is on facilities and the learning experience. This matter may somehow should be addressed as poor technical learning facilities may inhibit students' learning (Mittal et al., 2013).

Teaching and Learning Facilities

(S11) *LCD / Learning facilities need to be repaired*

(S27) *Upgrade/Improve facilities during foundation class season (Sem 1 & Sem 2) when undergraduates are on semester break*

Varieties of Learning Experience

(S24) *For me, one of the weaknesses of the courses offered is that the way of learning is the same at every time, ie lecture, tutorial and lab. In my opinion, students will understand a subject better when there are activities related to the subject such as competitions or campaigns. This is because, in order to succeed in a competition, the student must have enough knowledge to be evaluated by the lecturers.*

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(S27) *Diversify learning activities.*

(S32) *This is just my opinion, some lecturers are very passive in their teaching styles. So, often the vibe they give is absorbed by students, might affect the student's enthusiasm to learn and relate to the new topic. Besides that, PPST should consider giving talks or maybe courses related to current issues so that students are also exposed to what is happening outside (example: politics, discrimination, racism, poverty, currency, sex education etc.). Things that are never taught in school. Had too much of Moral Education and History since primary and high school.*

Conclusion

This study draws attention to the need for students to create prominent identities as a core element of their professional learning. Through questionnaires, majority of 35 Engineering course students agreed that the Foundation in Science Programme in UMS has provided them relevant knowledge and skills to pursue their degree. The interdisciplinary aspect, the methodological approach, the thematic relevance to student needs and the friendly atmosphere were particularly praised. Further suggestions received and changes to the programme in the new academic year will be continuously monitored and reviewed for academic quality assurance.

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References

Bardi, M., & Muresan, L. (2012). Student perceptions of programme quality – a tool for improvement. *Quality Assurance Review for Higher Education, 4*(1), 14-22.

Bhatnagar, K. R., & Oberoi, A. (2022). Students' perceptions on newly designed foundation course at MBBS entry level: A mixed-method study. *Industrial psychiatry journal*, *31*(1), 141–150. https://doi.org/10.4103/ipj.ipj_67_20

Che Hussin, C.H., Juhan, N., Lasaraiya, S., & Nasrullah, A. A. (2021). Special issue: foundation program education post-covid-19: issues and opportunities students' perspectives in studying mathematics subject through e-learning tools at foundation education level. *Journal of Information System and Technology Management*, *6*(23), 108–117. https://doi.org/10.35631/ JISTM.623009

Din, W.A., Saikim, F.H., Swanto, S., Latip, N.A., Ismail, I.H., & Rasit, M.R. (2020). Students' perspectives on the effectiveness of problem-based learning with inverted classroom assistance in improving understanding of foundations courses. *Akademika, 90(2), 63-78, https://doi.org/10.17576/akad-2020-90IK2-06.*

Eldy, E. F., Chang, J. H. W., Butai, S. N., Basri, N. F., Awang, H., Din, W. A., & Arshad, S. E. (2019). Inverted classroom improves pre-university students understanding on basic topic of physics: the preliminary study. *Journal of Technology and Science Education JOTSE*, *3*, 2019–2028. https://doi.org/10.3926/jotse.599

Gangwar, V., Singh, M., & Lumbani, A. (2022). Student's perception of utility and application of skills taught during the foundation course at a medical college in central Uttar Pradesh, India. *Journal of Family Medicine and Primary Care*, *11*(5), 1929. https://doi.org/10.4103/JFMPC. JFMPC_1740_21

International Journal of Education, Psychology and Counseling
IJEPC
EISSN : 0128-164X
Volume 7 Issue 48 (December 2022) PP. 469-478
DOI 10.35631/IJEPC.748035

Juhan, N., Che Hussin, C.H., Abdul Rajak, M.A., & Bakri, S.N.S. (2021). Video-based learning on statistical topics among foundation students in Universiti Malaysia Sabah: an in-depth analysis of satisfaction. *Journal of Information System and Technology Management*, *6*(23), 118–127. https://doi.org/10.35631/JISTM.623010

Malaysian Qualifications Agency (MQA), (2014). Guidelines to Good Practices: Monitoring, Reviewing and Continually Improving Institutional Quality (GGP: MR-CIIQ). https://www2.mqa.gov.my/qad/garispanduan/MR%20CIIQ%20BI.pdf

Malaysian Qualifications Register Accreditation, (2022). https://www2.mqa.gov.my/mqr/

Malaysian Qualifications Register UMS, (2022). https://www2.mqa. gov.my/mqr/english/ eiptaKPListAA_print.cfm?IDAkrIPTS=250

Matawali, A., Bakri, S. N. S., Jumat, N. R., Ismail, I. H., Arshad, S. E., & Din, W. A. (2019). The preliminary study on inverted problem-based learning in biology among science foundation students. *International Journal of Evaluation and Research in Education*, *8*(4), 713–718. https://doi.org/10.11591/IJERE.V8I4.20294

Mittal, R., Mahajan, R., & Mittal, N. (2013). Foundation programme: A student's perspective. *International Journal of Applied & Basic Medical Research*, *3*(1), 52–54. https://doi.org/10.4103/2229-516X.112241

Ooms, A., Burke, L. M., Marks-Maran, D. J., Webb, M., & Cooper, D. (2012). Students' perceptions of foundation degrees. *36*(3), 403–421. https://doi.org/10.1080/0309877X.2011.632821

PPST Entry Requirements, (2015). https://www.ums.edu.my/ppstv2/en/academic/entry-requirements

PPST Profile, (2015). https://www.ums.edu.my/ppstv2/en/about-us/profile

Preparatory Centre for Science and Technology, (2022). https://www.ums.edu. my/ppstv2/files /FINAL-PPST_Book-Double_Spread_Dark_ Blue_compressed.pdf

Yograj, S., Gupta, R. K., Bhat, A. N., Badyal, D. K., Arora, A., & Arora, A. (2021). Perceptions of stakeholders regarding the foundation course. *Indian Journal of Physiology and Pharmacology*, *64*(Suppl 1), S51–S58. https://doi.org/10.25259/IJPP_271_2020