

First Year Students' Perceptions of their Computer-Related Skills: A Preliminary Study

Lazim Abdullah¹, Wan Abd Aziz Wan Mohd Amin², Noor Rohana Mansor³, Noor Maizura Mohamad Noor⁴,
Nur Amirah Amirudin⁵

^{1,2,3,4&5}Centre of Quality and Academic Development, University Malaysia Terengganu, Kuala Terengganu, Malaysia
lazim_m@umt.edu.my, ziza@umt.edu.my, nor_rohana@umt.edu.my, maizura@umt.edu.my, amirah@umt.edu.my

Abstract- In today's technology savvy society, students are required to be proficient in computer skills to compete in today's global job market. Students at public university are expected to attain some competency levels of computer-related skills. However the computer skill acquisition at university education is much depends on the existing skills that the students accumulated throughout years of pre-university and secondary education. It is nearly impossible to students to be self competent in their tertiary education and subsequently workplace without considering their computer skills background. Thus the objective of this paper is to describe first year students' perceptions toward their computer related proficiency skills. This research was conducted in a newly established public university at the East Coast of Peninsular Malaysia. This study explores a group of 851 first year students' perceived level of mastery of their computer skills. An instrument was developed to capture students' perceptions of their computer proficiency. The assessment tool evaluated students' knowledge in six computer application skills – word processing, spreadsheet, databases, multimedia, desktop publishing and Internet– with three levels of competence – 'not at all', 'somewhat competent' and 'very competent'. The finding of this study shows that more than fifty percent students perceived all the computer related skills except internet at 'somewhat competent'. There were more than ten percent students admitted that they do not possess any knowledge or skills in the application of spreadsheet, word processing and databases. Interestingly, more than sixty percent students perceived their level of competence in internet application at 'very competent'. The results suggest that the curriculum may embed indirect computer related skills to students. It is hoped that courses may realigned to concentrate on the substantial skill deficiency in word processing and spreadsheet skills while still allowing the students to demonstrate their level of competence in other skills. These findings have important implications for higher institution with a similar profile for possibly enhancement of the computer related skills.

Keywords- Computer literacy, Higher education, Computer proficiency, Computer skills assessment, perceived computer skills

I. INTRODUCTION

Recent technology especially computer related technology has changed rapidly and continues to change way of life, carry out business and interact socially. New and improved technology appears almost daily. Most jobs require personnel to have some level of interaction and expertise with computer related technology. These technologies are intricately woven into businesses, healthcare industry, manufacturing industry, banking and food industry. At the same time employers demand graduates who are prepared to leverage technology in a scalable fashion to advance the firms' strategies and operations. Computers are often seen as the gateway to membership in the global information society and a requirement for the workforce of the future [1]. Since computing continues to have a significant impact on the world, an understanding of computer technology and its uses is important for all members of our society to be effective consumers and producers in the 21st century and beyond [2]. Today's organizations demand that workers have a basic level of computer literacy due to their dependency on computers to operate better, faster, and cheaper. Therefore, it is likely that in almost all areas of employment, computer will be a basic tool that is essential

for shouldering job responsibilities.

Mismatch of computer skills and employer expectation indeed a global phenomenon and not exclusively for developed nations. In Malaysia graduate are expected to acquire some extent of skills in computer related skills as these skills have become the essential skills in pursuing the fully-developed nation status by the year 2020. The importance of computer related skills was emphasized by the Malaysian Government which connoted that computer technology is an enabler for Malaysia to achieve the National Vision, which is to attain the status of a developed country by the year 2020 [3], [4]. Preparing students for employment and beyond requires that the current and emerging needs of industry be assessed in an effort to ensure that graduates are equipped with toolkits to be productive [5]. In order to respond to the demand for technologically savvy graduates, technology-enriched pedagogy, founded on technology-equipped facilities and new curricula is required to keep pace and hopefully ahead of industry.

Besides curricula, issue of computer skills among undergraduates is still becomes a topic of discussion. Keengwe [6] found that students lack computer skill in

various computer applications that are necessary to support and enhance their learning experience. In Carter and Boyle [7], the authors discussed the effects of student and faculty expectations along with curricular issues in achieving success. Educators are facing tremendous challenges in identifying, developing, and designing curriculum that will prepare undergraduates in the next century [8], [9]. Ideally, institute of higher education requires students to embrace the essential knowledge and skills that all students need to be active, lifelong learners in a technology intensive environment. Despite widespread use of the internet today's college students do not have the necessary IT fluency skills [10], [11], [12]. The curriculum is designed to form the foundation for continuous learning and to be applicable to ever-changing innovations. Although there is no specific computer skills course requirement, students ideally must demonstrate proficiency in some basic computer application skills. The computer skills are equally important in Malaysian higher education setting. One of the important components in a composite soft skill for institute of higher learning in Malaysia is the requirement of students to develop lifelong learning and information management skills [13]. Computer skills indeed become one of essential tools in developing these skills. Unfortunately, some evidence shows that the nation's educational institutions are unable to meet the growing needs of the business community for outstanding technical professionals' [14]. At a time when salaries of technology professionals are skyrocketing and other perks are impressive, it comes as a surprise to many that more students are not flocking to computer science and information technology programs. One possible reason students may hesitate to enroll in computer science programs is their negative perceptions about technology careers. The results from [15] appear to support the idea that IT careers have an image problem, specifically, negative perceptions regarding how those in IT fields relate to people. Attitudes and perceptions toward specific careers have an enormous impact on the choices that high school students make, and in fact, attitudes sometimes play a greater role in career choice than classroom education, job opportunities, future career growth, and long-term earning potential [16]. There is a growing concern that students today are not prepared to live, learn, and work in a technology-rich society [17], [18]. Hence, the importance of shaping positive attitudes toward science and technology skills cannot be underscored. It seems that the role of educators at higher institution in identifying students' perceptions toward computer skills is very much relevant. Steps must be geared toward recognizing the need to increase the computer proficiency skills among undergraduates. In other words, inculcating and nurturing of computer skills must be partly shouldered by higher education institutions.

When a new semester begins, it is a typical scenario to witness thousands of first year students registered at institute of higher learning. They supposedly should have a basic perception about their computer proficiency skills. It

is assumed that every student entering institute of higher education has some basic computer proficiency skills. However Norzaiddi, et al [19] cautiously state that there were significantly different influences of the types of schools students enrolled in, their computer ownership and computer club memberships on their computer skills. Therefore cohort of first students that comes with different backgrounds may contribute to their computer skills at institute of higher learning. When their lives at institute of higher education begin, they are expected not only passing a required entrance examination prior to registration but also outfit with their prior computer experiences. Students are required to take courses with the assumption that they already possessed some extents of computer application skills. Additionally, many educators have a perception that students are becoming more computer literate especially with the current new millennium batches of students. Compeau, and Higgins [20] asserted that prior computer experience/performance and assessment has been shown to positively impact students' perception of their computer skills and usage. Institute of higher learning has an obligation to ensure veracity or accuracy of these perceptions in order to fine-tune the curriculum so that students are adequately prepared and challenged. The goals for courses are to familiarize incoming first year students with computer operating systems, fundamental and intermediate word processing commands, spreadsheet applications, presentation graphics, and database management. These skills are necessary to successfully matriculate throughout the university life, as well as to compete and secure future employment [6]. However, if the educators' perceptions are correct and, in fact, students are more computer literate, then educators must adjust the delivery of courses or programs accordingly or eliminate it all together. In order to provide a curriculum that addresses the issue of computer related skills, it is imperative to understand the student's perception of his or her computer application skills. The current study begins to analyze and assess the computer proficiency of students entering first year university curriculum. These evaluations are based on the students' perceptions of their current skill level. Specifically, the purpose of this research is to evaluate the first year student's perception of his or her computer application skills prior to embarking the required university courses.

II. METHODOLOGY

This study seeks to profile the computer skill competency level among first year students. This information is vital for institute of higher learning in developing a component of students' generic skill through some modifications in curriculum and teaching and learning process.

A. Participants

The sample for this study was first year undergraduate students enrolled in a small sized public university in the East coast of Peninsular Malaysia. These students were enrolled in various courses under their respective programs and departments. Students across four academic faculties were given the voluntary survey over their computer-based skills assessment. Out of 1, 384 newly

registered (first year) students enrolled these four faculties, 851 completed and returned their survey.

B. Instruments (Survey and Assessment)

The Perceived Computer Skills Survey utilized in this study is designed to capture students' perception of their computer application skills prior to starting their programs and courses. The survey consists of personal data section and six sections of computer related skills ranging from words processing skills to internet applications. Personal data section is designed to capture students' details such as faculty, program, and departments. The computer related skills sections consist of 29 items of computer experience is designed to capture students' perceptions on their competency with computer applications. The first section of computer related skills is designed with 8 items to capture skill of word processing. An example of the items under the section of word processing is 'I can cut, copy and paste document'. The second, third, fourth and fifth section is designed to tap students' perceptions about their skill in spreadsheet, databases, multimedia integration, and desktop publishing respectively. The last section of computer related skill is internet applications which consist of 5 items. This section is designed to capture students' skills in using search engine and surfing. All items allow students to rate their perceived computer proficiency using a 3-point Likert-scale evaluation where 1- indicates not at all, 2- somewhat competent and 3-very competent in six (6) computer applications areas: word processing, spreadsheet applications, database, multimedia, desktop publishing and internet applications.

C. Procedures

Students were given the survey on the first day of class, asked to complete the survey and hand it to the lecturer prior to the class ending. Students were informed that the survey was on voluntary basis and would not affect their performance or evaluation in the course.

III. RESULTS AND DISCUSSION

This research is interested in students perceive their skills over the six applications discussed previously and no intention to explore relationships between students background and computer skills. Results are presented in accordance with the skills and academic faculty.

The survey asked students to rate their skill level with various computer applications. Table I provides the results for the word processing skills in accordance with their faculty. Full name of the faculty are remained anonymous and abbreviated.

TABLE I
 SKILLS COMPETENCY RATINGS IN WORD PROCESSING AND SPREADSHEET

Faculty	Skill: Word Processing			Skill: Spreadsheet		
	NA	SC	VC	NA	SC	VC
FST	19 (17%)	138 (47%)	135 (46%)	47 (10%)	299 (64%)	122 (26%)
FPE	1 (1%)	99 (52%)	90 (47%)	50 (15%)	213 (66%)	63 (19%)
FASM	20 (8%)	149 (63%)	70 (29%)	23 (9%)	180 (73%)	45 (18%)
FMSM	13 (10%)	65 (50%)	52 (40%)	23 (12%)	119 (64%)	45 (24%)

* Note: Not At All (NA) Somewhat Competent (SC) Very Competent (VC)

The faculty of FPE recorded the highest percentage of 'very competent' in word processing skills but relatively low percentage in spreadsheet skill. The nature of programs which are more emphasis on writings such as languages and management may contribute to the finding. Contrastingly, the faculty of FST provided the highest percentage of 'very competent' in spreadsheet skills. This result probably due to the data management skills required at this faculty. The agriculture based faculty, FASM recorded the lowest percentages of 'very competent' in these two skills.

Table II presents the results of competency rating in the skills of database and multimedia.

TABLE II
 SKILLS COMPETENCY RATINGS IN DATA BASE AND MULTIMEDIA

Faculty	Skill: Database			Skill: Multimedia		
	NA	SC	VC	NA	SC	VC
FST	89 (20%)	312 (70%)	44 (10%)	0 (0%)	250 (57%)	192 (43%)
FPE	60 (19%)	229 (74%)	21 (7%)	0 (0%)	239 (72%)	95 (28%)
FASM	59 (22%)	181 (69%)	23 (9%)	1 (0%)	149 (60%)	102 (40%)
FMSM	41 (23%)	122 (68%)	16 (9%)	1 (1%)	115 (59%)	78 (40%)

* Note: Not At All (NA) Somewhat Competent (SC) Very Competent (VC)

More than sixty percent of first year students at the four faculties were rated themselves at 'somewhat competent' in database skills. It is indeed a good indicator that more than 40 percent of the students across faculties rated at 'very competent' in multimedia skills except faculty of FPE. Again students' background and nature of study discipline are believed to contribute to the findings.

Table III provides some clues on the how students perceived skills over desktop publishing and Internet applications.

TABLE III
 SKILLS COMPETENCY RATINGS IN DESKTOP PUBLISHING AND INTERNET

Faculty	Skill: Desktop Publishing			Skill: Internet		
	NA	SC	VC	NA	SC	VC
FST	24 (5%)	301 (69%)	115 (26%)	1 (0%)	131 (27%)	360 (73%)
FPE	43 (14%)	203 (67%)	58 (19%)	5 (1%)	146 (41%)	209 (58%)
FASM	21 (8%)	191 (72%)	52 (20%)	4 (1%)	87 (32%)	177 (67%)
FMSM	18 (10%)	108 (59%)	57 (31%)	4 (2%)	63 (31%)	136 (67%)

* Note: Not At All (NA) Somewhat Competent (SC) Very Competent (VC)

The majority of students (more than 50 percents) admitted that they were just ‘somewhat competent’ in desktop publishing skills. Almost sixty percent and above of students from all faculties rated themselves as a group of ‘very competent’ in internet skills. This was not a surprising result as many students have been exposed with internet at their homes or cybercafés prior to commencing study at the university.

The competencies levels are then analyze according to the skills for the whole first year students. This analysis enables us to see the strength of each skill in three different competency levels. This is shown in Table IV.

TABLE IV
 COMPETENCY LEVELS AND SKILLS

Skills	Not at all	Somewhat competent	Very competent
Word processing	53(6%)	451(53%)	347(41%)
Spreadsheet	149(12%)	811(65%)	286(23%)
Database	249(21%)	842(70%)	104(9%)
Multimedia	2 (0%)	753(62%)	467(38%)
Desktop publishing	106 (9%)	803(67%)	282 (24%)
Internet	14(1%)	427(32%)	882(67%)

It can be seen that more than ten percent of students acknowledged that they have no idea about spreadsheet and data base. More than fifty percent of students were complacent in the zone of ‘somewhat competent’ in all the surveyed skills except internet applications. The students probably lost in the enjoyment of surfing and browsing internet without realizing that the other computer related skills are equally important.

These results perhaps could provide preliminary evidence on how students perceived of their computer skills and how it might impact their studies at institute of higher learning. In discussing these findings, there were some studies conducted outside Malaysia to describe competency levels of computer skills among first year students or freshmen. Tesch, et al. [21] assessed a college freshmen at orientation week and demonstrated students proficiency of skills using the Microsoft Office. Out of 20 basic tasks for Microsoft Word, at least 80% of students

successfully completed 14 of them. Seven of the 29 tasks for Excel were completed by 80% of the students. Many were unable to delete selected cells, use formulas, such as absolute references, current date and time and relative cell references. At least 80% of students were successful at completing six of 15 PowerPoint tasks, including deleting and adding slides, running a slide show and editing contents. Finally, students were tested on their ability to use Microsoft XP and program management skills. Out of the 11 tasks, none were successfully completed by 80% or more of students. Ninety-eight percent missed the question pertaining to viewing contents of the Documents and Settings folder on the C: drive.

In other research, Wallace and Clariana [22] conducted a study of 140 incoming freshman business majors to determine their computer knowledge and skills to see if an introductory computer fundamentals course is necessary at the college. Two tests were given, one for computer concepts and the other for the software program Excel. The computer concepts pretest showed a mean of 57.6 and the Excel pretest showed a mean of 59.5. After the course, the computer concepts posttest showed a mean of 78 and the Excel test showed a mean of 82.4. These scores demonstrate that incoming students do not have a basic knowledge of computer concepts and programs, despite professors’ expectations.

A similar research was conducted by Hardy, et al. [23] at a university in United States. The research aims to screen students for a certain course. They may enjoy an exemption of a computer literacy course if they receive a score of 80% in mastery of various skills. However, after 164 students were assessed, it became clear that very few (three out of the 164) have the skills to test out of the course. The word processing assessment showed 20.7% of students having 80% or higher mastery, while a majority of students (51.2%) scored between 60% and 79% on their proficiency. The students’ proficiency on spreadsheet skills was poor, as 69.5% showed less than 60% mastery. They demonstrated an even poorer proficiency at database skills as 81.1% had less than 60% mastery of skills. In both spreadsheet and database skills, only 1.2% of students had an 80% proficiency. There was a slight improvement in computer concepts, as 1.5% of students had 80% mastery; however, 83.5% had less than 60% mastery. Overall the assessment demonstrated that 73.8% of students had less than 60% computer literacy, 25% scored between 60 and 79% on literacy and 1.2% scored the required 80% or higher to test out of the course.

All these studies indicate that while a large majority of students indicate that they own computers and have access to the Internet, but their skills that directly related to their courses at institute of higher education were rather disappointing. It was not a surprising finding as the recent trends of young generations are obsessed with social networking activities which totally depend on internet access. Therefore institutions of higher learning need to monitor the technology literacy levels of their students and design interventions to ensure that graduates have

competent knowledge and skills they will need to succeed in the workforce.

IV. CONCLUSIONS

The importance of achieving a degree of proficiency in computer applications as well as overall computer literacy have been recognized as essential factors in today's competitive job market. The use of computers in homes and schools has aided the perception that more students are computer literate than past generations. There is a potential reason in manifesting the students' perceived competency of computer application skills at university. The purpose of this study is to analyze students' overall perception of their computer skill proficiency (i.e., not at all, somewhat competent, very competent) in utilizing six different computer applications. To accomplish the objectives of this research an instrument is utilized to capture students' perceptions of their computer skills to measure their proficiency. In this study, analyzing is made according to four different faculties and overall achievement according to competency levels. The findings of this study indicate some differences in the student's perception of their skills between faculties.

There are many suggestions in a way computer skills can be improved among students. Computer literacy skills can be incorporated across the curriculum through developing lecturers' technology skill sets, train lecturers on how and when to effectively integrate technology and pedagogy, increase lecturer and administrator awareness about how their students differ in technology savvy and access to technology resources, and how to translate that into instruction. The authors also recommend that faculty level courses may begin to incorporate some of the basic or intellectual such as spreadsheet and word processing. Faculty also may allow the students to work collaboratively to incorporate technology into their assignments and other academic activities.

As a result of this study, the curriculum for programs should take consideration the students' competency level. Also, perhaps courses offered should modify their approaches to address the students' performance in deficiency in spreadsheet skills. Requirements of job market and students' knowledge, experience, and self-efficacy of computer applications are continually changing. Therefore, the continuous evaluation of students' perception and performance in basic computer skills is required in order to evaluate the computer applications course. The enhancement and realignment of this course is essential for educators to prepare students for today's global economy.

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