A STUDY OF COMPUTER SELF-EFFICACY UNDERGRADUATE STUDENTS FROM RURAL AREAS

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Abstract

Self-efficacy plays an important role in learning process. A number of ICT projects have been developed and introduced to fill the gap between the rural and urban area. This article presents a quantitative study on undergraduate students' perceived computer self-efficacy from rural area. A total of 128 first semester undergraduate students participated in the survey, employing a 27-item questionnaire measuring computer self-efficacy. The items were pilot-tested before being administered to the respondents. Results of the study show that computer self-efficacy level is high. In term of basic and advanced computer self-efficacy also high but still some of computer skills need to be look at. The outcome of the study indicates rural community has adopted the ICT as part of their lifestyle.

Keywords: Computer self-efficacy; undergraduate students; rural areas

1.0 INTRODUCTION

Self-efficacy plays an important part in a students' learning process [1]. Self-efficacy is defined as "people's judgment of their capabilities to organize and execute sequences of actions required to attain chosen types of performance. It is concerned not with the skills one has but with judgment of what one can do with whatever skills one possesses" [4]. The theory originates from Albert Bandura, a reconized Canadian psychologist [4].

Computer self-efficacy is adapted from the self-efficacy theory which is a student's perceived ability to use a computer. Miura [19] has suggested that self-efficacy is an important feature to achieve computing skills. Delcourt and Kinzie [14] defined computer self-efficacy as a measure of how confident the student is with their capability to understand, use, and apply computer knowledge and skills. The authors found that students who have high computer self-efficacy will feel competent in using diverse computer hardware and software. Conversely, low computer self-efficacy leads to the belief that student will meet struggles in using computers hardware and software.

ICT (Information and Communication Technologies) development has been emphasized by the Malaysian government in rural areas for a long time [12, 23, 24]. A number of ICT projects such as The National Information and Technology Agenda (NITA) [12], Rural Internet Center [23] and Village WiFi services [24] has been introduced to fill-up the ICT knowledge gap between rural and urban areas.

In Malaysia, there is a lot of researches on students' self-efficacy, for examples self-efficacy in learning English [2], self-efficacy in general learning [11], self-efficacy in learning Mathematics and English [3] and computer self-efficacy towards internet [12]. Second there is many research on ICT knowledge level of rural area communities [12, 20, 21, 22]. However, none of the studies focuses on undergraduate students' computer self-efficacy from rural area. Therefore, this present study focuses on students' self-efficacy in computer skills in higher institutions from rural areas. It is hoped that this study will add to the literature in this area.

2.0 LITERATURE REVIEW

2.1 ICT in Rural Area

Although there are numerous researches done in rural education, educators across the world have not come to an agreement as to the meaning of rural. Different researchers have a different definition about the rural concept. A definition given by Ibrahim Ngah [24] which suits well in this study is "rural as the area outside urban including settlements with a population less than 10,000 people, within the agriculture area, forest area or water bodies".

In Malaysia, a study done by Noor Sharifah et. al. [20], discovered that computer owned among rural community is generally limited. From 1,652 household surveys, the author found that only 18.6% owned a computer. Another researcher, Musa et. al. [21], supported this fact. The researcher stated that the main problem that caused low ICT usage is the ability to use ICT. Another researcher, Abu Samah et. al.[22], said that rural community were still lacking in ICT knowledge and skills particularly in computer usage. Figure 1, explains a number of reasons why rural communities have less awareness to use ICT [12].

From the stated reason (Figure 1), there is a solution. Since 1957 rural development evolution and transformation has started with equity development of the New Economy pre-policy.

From1994 to 2020, the second era of revolution focused on rural development to achieved balance development according to the State Vision Policy [12]. One of the policies is to make ICT lliteracy among the rural community. To achieve this objective, numerous efforts have been introduced by the Malaysian government which is:

1. **The National Information and Technology Agenda (NITA)** - launched by Tun Dr. Mahathir Mohamad former prime minister in 1996. NITA was introduce in order to promote and strengthen ICT awareness and usage particularly the rural community [12].
2. **Rural Internet Center** - also known as PID (Pusat Internet Desa). PID projects started by Ministry of Information Communication and Culture (MICC)in 2000. The project is responsible in filling the gap that occurs between the rural and urban community in term of ICT usage, skills and knowledge. Among the services offered were ICT training in computer applications, e-mail usage and website surfing [23].
3. **Rural Info Center** - known as MID (Medan Info Desa). This project was set-up through Infodesa by the Ministry of Rural and Regional Development (MRRD). The key objective is to expose ICT facilities and conduct basic ICT trainings to the rural community. Among the services offered are training on basic and advanced computer skills, computer and internet services, Infodesa portal, printing, website services, computer repair and information on villages nationwide [23].
4. **Village WiFi services** - known as Kampung Tanpa Wayar (KTW). Implemented by the MCMC under the National Broadband Initiative (NBI) and is funded through the Universal Service Provision (USP) fund which is implemented by the selected telecommunication service provider since 2007 [24].

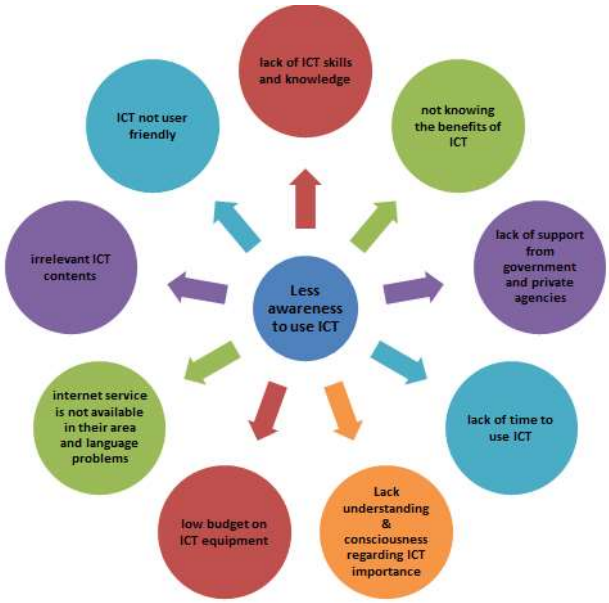

Figure 1 Reasons less awareness to use ICT by Rural Communities

2.2 Computer Self-Efficacy

Learning efficacy also called self-efficacy refers to what a student believes can do in a particular learning task. Self-efficacy theory beliefs on four sources of information which are choice of activities, level of effort expended, persistence in the face of difficulties and performance [4].

Students tend to have some self-efficacy beliefs. That is, they hold some opinions about their ability in relation to the specific learning domain. They also hold some outcome expectations (opinions they hold about the success or failure of specific actions). For example, a student might want to use computer to do some task with the view that: "I tend to find computer is difficult to operate (self-efficacy belief) so I am likely to need a lot of help to complete the task (outcome expectation)". These beliefs tend to act as a frame of reference that guide students' thinking, feelings and actions in a learning situation. Adapted from the self-efficacy theory, computer self-efficacy is an individual's ability to use a computer.

3.0 METHODOLOGY

The purpose of this study was to identify undergraduate students' computer self-efficacy from a rural environment. A quantitative survey approach was adapted for this research.

3.1 Instrument

A questionnaire was used to answer research questions. In many evaluations, a questionnaire aids as the main source of information which can be tabulated and discuss.

There are many instruments that have been developed to evaluate computer self-efficacy [5, 6, 13, 14, 15,16, 17]. To select an appropriate computer self-efficacy instrument, the researcher needs to identify what computer skills need to measured [18].

Murphy et. al. [5], developed a 32-item instrument for computer self-efficacy based on Banduras' work [4]. The instrument consist three features which are "beginning level computer skills", "advanced level computer skills" and "mainframe computer skills". The instrument was validated and the reported Cronbach's alpha for the three derived features was .97, .96, and .92.

Torkzadeh and Koufteros [6] recommended four features of 30-item adapted from Murphy et al. [5]. In the recommended instrument "file and software skills" was added. The instrument was validated with an oblique rotation and reported reliability for each as .94, .96, .90, .91 respectively.

In this study, both scales [5,6] have been adapted. The adapted instrument comprises 2 parts, demographic and 27-items to which discovering students' computer self-efficacy where each item is preceded by the phrase "I feel confident". This 27-items had two sub-categories, basic skills (13 items) and advanced skills (14 items). The strength of self-efficacy is measured by responses on a 5 point Likert type scale ranging from 1 (not confident at all) to 5 (absolutely confident). The score obtainable from the scale is in the range of the minimum 27 and the maximum of 135 points. The indication of student computer self-efficacy identifies as low, average and high. The range of student self-efficacy is shown in Table 1. High scores indicate respondents' high levels of self-efficacy in using computers and vice-versa.

Table 1 Students' Computer Self-Efficacy Level

Overall Self-Efficacy		
Low	**Average**	**High**
27-62	64 – 99	100 -135
Basic Skills		
Low	**Average**	**High**
13 - 29	30 - 47	48 - 65
Advanced Skills		
Low	**Average**	**High**
14 - 32	33 - 51	52 – 70

3.2 Instrument Validity and Reliability

A questionnaire must be validated to make sure that it accurately measures what it is supposed to do, regardless of the responder [7]. Valid questionnaire helps to collect better quality data with high comparability which reduces the effort and increase the reliability of data. The designed instrument has been validated using content and face validation.

Content validation in any tool says how well the individual items in the tool correspond to the concept of what are being examined. The designed instrument was given and reviewed by four IT lecturers according to the validation criteria (Table 2).

Table 2 Content Validity Index

Content Validation Criteria	L1	L2	L3	L4	L5	CVI
1. The objective of the instrument is stated clearly.	✓	✓	✓	✓	✓	1.00
2. The format is appropriate.	✓	✓	✓	✓	✓	1.00
3. The font size is appropriate.	✓	✓	✓	✓	✓	1.00
4. The meaning of every item is clear.	✓	✓	✓	✓	✓	1.00
5. The instruction is clear.	✓	✓	✓	✓	✓	1.00
6. The measurement scale is appropriate.	✓	✓	✓	✓	✓	1.00
Average CVI						1.00

L – Lecturer

IT lecturers agree that the items are appropriate based on the study objectives and that the items are representative of the important factors for students' computer self-efficacy. Table 1 shows the lecturers rating on the content validity of each item. All the items are been rated as "Strongly Agreed" and content validity index (CVI) is 1.00 shows the high validity of the questionnaire.

The designed instrument was face validated by 29 undergraduate computing students according to the validation criteria (Table 3). All the items in the instrument were very relevant to the content of the study due to the reliability coefficient yielded an r = 0.755 through Cronbach's alpha [8].

Table 3 Face Validity

Face Validation Criteria	Mean	Std. deviation	N
1. The instruction is clear.	4.52	.574	29
2. The wording of the questions is easy to understand.	4.31	.604	29
3. The flow of the questions is easy to follow.	4.52	.634	29
4. The time taken to answer the survey questions is reasonable.	4.28	.751	29
5. The meaning of every item is clear.	4.24	.689	29
6. The format is appropriate.	4.31	.660	29
7. The font size is appropriate.	4.76	.435	29

3.3 Study Group and Data Collection

Cluster sampling technique has been applied for data collection [9]. Cluster involves group of participants

that represent the population are identified and included in the sample. In this study, the cluster study groups are undergraduate students who are taking the Introduction to Information Technology course.

According to Roscoe [10], a sample size larger than 30 and less than 500 is most appropriate for researchers. For this study, 245 students participate in data collection from 5 different programs (Agriculture, Business, Biotechnology, Computing and Medical Lab Technology) on the day class commenced. Data collection takes place in the academic year 2015, May semester. The participants are first semester students.

4.0 RESULTS AND DISCUSSION

A computer self-efficacy questionnaire was employed to collect data. Students were asked to complete the questionnaire during the class time to secure a high response rate. Among the 245 questionnaire received, 128 respondent were identified from rural area based on their home address. Their profile is shown in Table 3.

Gender	
Male	74 (58%)
Female	54 (42%)
Age	18 >= and <=40
Computer Experiences	
Yes	128 (100%)
No	0 (0%)
	– Average Experiences = 7.5 years
	– Minimum Experiences = less than 1 year

Table 3 Participant Profile (n = 128)

The levels of computer literacy have been categorized into four categories, namely poor, adequate and excellent. From the analysis, most of the students responded with "good" for their computer literacy level (Table 4).

Table 4 Level of Computer Literacy (n = 128)

Level	n	%
Poor	21	16.4
Adequate	19	14.8
Good	78	61.0
Excellent	10	7.8

As shown in Figure 2, only 4% (n=5) of the students had a low level of computer self-efficacy efficacy. The majority of the students 61% (n=78) have high level of computer self-efficacy while the rest of the students had an average level of 35% (n= 45).

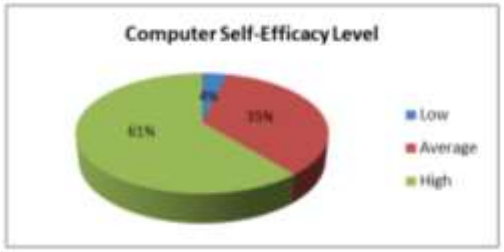

Figure 2 Level of Computer Self-Efficacy in Computer Skills (n=128)

Figure 3 shows basic and advanced computer self-efficacy levels. It can be said that the majority of students have high level of basic computer self-efficacy which is 68% (n = 87) while 30% (n=38) show average level and only 2% (n=3) had low level. For advanced computer self-efficacy level is 55% (n=77) high level, 40% (n=51) as average level and low level is only 5% (n = 6).

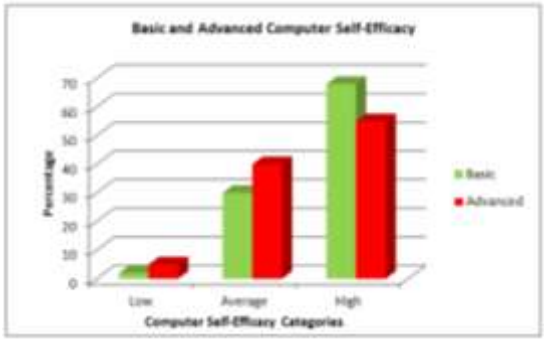

Figure 3 Level of Computer Self-Efficacy in Basic and Advanced Computer Skills (n=128)

Table 5 indicated descriptive analysis on computer self-efficacy undergraduate students from rural area. From the findings it can be said that students' confident level in computer skill is still below 50%. Looking on the "Most Confident" colum, the range of confident levels was 40% to 49% except there are a few computer skills which are below 40%. The skills are listed as below.

- Storing software correctly
- Using the computer to write a letter or essay
- Adding and deleting data from the storage devices.
- Explaining why a program (software) will or will not run on a given computer.
- Understanding the four stages of data processing: input, processing, output and storage.

Table 5 Descriptive Statistic for Students' Computer Self-Efficacy (n = 128)

Computer Self-Efficacy Question	Not confident at all	Slightly confident	Moderately confident	Mostly confident	Absolutely confident
1. I feel confident entering and saving data (numbers or words) into a file.	0	4	32	52	40

	(0%)	(3.1%)	(25.0%)	(40.6%)	(31.3%)
2. I feel confident calling up a data file to view on the monitor screen.	0 (0%)	4 (3.1%)	37 (28.9%)	57 (44.5%)	30 (23.4%)
3. I feel confident storing software correctly.	4 (3.1%)	6 (4.7%)	44 (34.4%)	50 (39.0%)	24 (18.6%)
4. I feel confident handling a storage device (pendrive, CD-ROM,DVD-ROM etc.) correctly.	0 (0%)	8 (6.3%)	27 (21.1%)	53 (41.4%)	40 (31.3%)
5. I feel confident escaping/exiting from a program or software.	0 (0%)	5 (3.9%)	28 (21.9%)	61 (47.7%)	34 (26.6%)
6. I feel confident making selections from an on screen menu.	0 (0%)	7 (5.5%)	20 (15.6%)	62 (48.4%)	39 (30.5%)
7. I feel confident copying an individual file.	0 (0%)	10 (7.8%)	24 (18.6%)	52 (40.6%)	42 (32.8%)
8. I feel confident using the computer to write a letter or essay.	2 (1.6%)	7 (5.5%)	27 (21.1%)	47 (36.7%)	45 (35.2%)
9. I feel confident moving the cursor around the monitor screen.	0 (0%)	0 (0%)	0 (0%)	0 (0%)	128 (100%)
10. I feel confident working on a personal computer (microcomputer).	2 (1.6%)	5 (3.9%)	26 (20.3%)	52 (40.6%)	43 (33.6%)
11. I feel confident using a printer to make a "hardcopy" of my work.	2 (1.6%)	6 (4.7%)	27 (21.1%)	53 (41.4%)	40 (31.3%)
12. I feel confident getting rid of files when they are no longer needed.	2 (1.6%)	2 (1.6%)	36 (28.1%)	53 (41.4%)	35 (27.3%)
13. I feel confident adding and deleting data from the storage devices.	3 (2.3%)	7 (5.5%)	33 (25.8%)	49 (38.3%)	36 (28.1%)
14. I feel confident getting software up and running.	2 (1.6%)	7 (5.5%)	28 (21.9%)	59 (46.1%)	32 (25.0%)
15. I feel confident organizing and managing files.	1 (0.8%)	8 (6.3%)	25 (19.5%)	59 (46.1%)	35 (27.3%)
16. I feel confident understanding terms/words relating to computer software.	1 (0.8%)	14 (10.9%)	37 (28.9%)	51 (39.8%)	25 (19.5%)
17. I feel confident understanding terms/words relating to computer hardware.	2 (1.6%)	13 (10.2%)	35 (27.3%)	58 (45.3%)	20 (15.6%)
18. I feel confident describing the function of computer hardware (keyboard, monitor, disk drives, central processing unit).	2 (1.6%)	12 (9.4%)	34 (26.6%)	55 (43.0%)	25 (19.5%)
19. I feel confident troubleshooting computer problems.	6	16	35	51	20

	(4.7%)	(12.5%)	(27.3%)	(39.8%)	(15.6%)
20. I feel confident explaining why a program (software) will or will not run on a given computer.	6 (4.7%)	12 (9.4%)	37 (28.9%)	49 (38.3%)	24 (18.6%)
21. I feel confident understanding the four stages of data processing: input, processing, output and storage.	7 (5.5%)	9 (7.0%)	40 (31.3%)	46 (35.9%)	26 (20.3%)
22. I feel confident learning to use a variety of programs (software).	2 (1.6%)	8 (6.3%)	32 (25.0%)	63 (49.2%)	23 (18.0%)
23. I feel confident using the computer to analyze number data.	3 (2.3%)	8 (6.3%)	36 (28.1%)	61 (47.7%)	20 (15.6%)
24. I feel confident learning advanced skills within a specific program (software).	3 (2.3%)	8 (6.3%)	37 (28.9%)	59 (46.1%)	21 (16.4%)
25. I feel confident using the computer to organize information.	0 (0%)	9 (7.0%)	37 (28.9%)	56 (43.8%)	26 (20.3%)
26. I feel confident using the user's guide when help is needed.	3 (2.3%)	5 (3.9%)	36 (28.1%)	56 (43.8%)	28 (21.9%)
27. I feel confident getting help for problems in the computer system.	3 (2.3%)	3 (2.3%)	39 (30.5%)	53 (41.4%)	30 (23.4%)

5.0 CONCLUSION

From the results, the rural area community has adopted the ICT as part of their lifestyle. The results also provide several points and issues which need to be considered. Even though students from rural area computer self-efficacy are high, still some basic and advanced computer skills need to be improved. This is because most of the computer efficacies level only in the range between 40 to 49 percentages (Table 5).

Another concern is that students with high computer self-efficacy may not necessarily have competent skills as they believe they have. In order to confirm that students' beliefs match their actual skills, a second stage of this research will be a computer practical test. Computer self-efficacy ratings could then be compared to actual performance from the practical test.

In conclusion, even though the result shows that the adoption of ICT by rural community has improved but the government still needs to enforce more ICT project and strategies. Through this enforcement, ICT literacy among rural area community can beachieved by the year 2020.

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