Online ICT-Courses Integrated For The Hearing-Impaired Individuals’ Education: A Preliminary Study from the Teachers’ Perception

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Abstract: - The existence of computers and internet has proven to be an essential asset in human’s life, mainly for the reason that it offers a doorway into the World Wide Web. This web that acts as a platform for e-learning education is an essential technology development; therefore the humans’ accessibility issues in Web applications are crucial. This very well includes the Hearing-Impaired Individuals. The objective of this research is to investigate the levels of knowledge, use, satisfaction and interest of the teachers (involved in the Hearing-Impaired Education Program), on ICT Education Courses via E-Learning. The Methodology of this research was designed in such a way where the questionnaires for these teachers’ acts as the research instrument involved in this research. A total of 24 schools executing the Hearing-Impaired Education Program from the whole of Malaysia is the research location. This brings a total of 48 teachers teaching the Hearing-Impaired Students of Form 4 and Form 5 of the Secondary Level as the research sample. In evaluating the results of the questionnaires, among all the ICT courses, the Computer Graphics course has the majority chosen by the teachers, mainly for reasons like enhances the Hearing-Impaired students’ deaf-creativity in drawing images, web-design, 3D-animation and multimedia purposes.

Key-Words: - E-Learning; ICT Education; the Hearing-Impaired Individuals; Computer Courses

1. Introduction
The existence of computers and internet has proven to be an essential asset in human’s life, mainly for the reason that it offers a doorway into the World Wide Web. This web that acts as a platform for e-learning education is an essential technology development; therefore the humans’ accessibility issues in Web applications are crucial. This very well includes the Hearing-Impaired Individuals. The speedy Web evolutions given by legislation on Web accessibility have also motivated educators to include this theme in online Internet courses. It is very crucial for societies to have the capability and right to use any software, hardware or any assistive technologies to understand and fully interact with the website content, regardless disability, geographical location, language barriers, or other impairing factor [1]. Learning online also known as Electronic-Learning; can be defined as the Learning Education conducted through the computer technology medium [2]. In other words, face-to-face interaction does not exist; since learning by electronic means is carry out in advance virtual-learning spaces. It is extremely vital that these virtual learning environments (VLE), learning management systems (LMS), web-based trainings (WBT) and other e-learning applications and educational technologies are to be accessible to all type of individuals; which mainly in this study, our concern is the Hearing-Impaired Individuals. In this research, this study investigates the interests of the teachers teaching the Hearing-Impaired
Students towards the various ICT-Education courses, via online-learning.

The Hearing-Impaired Individuals’ higher education is a significant component for a country’s nation development. These higher education allows these Individuals to attain the essential knowledge and skills for social survival and employment, just as the same as the Normal-Hearing Individuals. An individual with disabilities is integrated in as natural an environment as possible, as defined in Education in a fully inclusive model [3]. However, for The Hearing-Impaired Individuals, the disability to detect frequencies or low-amplitude sounds exists, where they could not perceive sound due to their loss in the sense of hearing. When this happens, the hearing loss affects the ability to both receive and produce spoken language, hence it is rather common for a Hearing-Impaired Individual to struggle with spoken and written language, as their understanding of speech acquisitions are poor. Hence, the language used by these individuals to communicate with one another is the Sign Language. Sign Language is the most important social behavior for the Hearing-Impaired, as it is the most convenient and efficient communication tool. It is often true that in higher education, numerous universities institutions do have interpreters who are fluent in both signing and speech, to support the students, teachers and staff.

ICT Education has increasingly become a well-liked course in the higher education, not only for the normal individuals, but for the hearing-impaired individuals too. These courses include Computer Graphics, Multimedia, Web-Design and 3D-Animation. To ensure the hearing-impaired individuals have full access to computer applications and programming tools, Academic Educators teaching computer courses must make efforts to make this possible, alongside with the existing tendency towards teaching Graphical User Interfaces (GUI). This is of course, taught, learnt and shown with the help of the Sign Language too. The continuous computer technology development has made ICT and Educational Technology becomes progressively more vital in education. However, subject to learning in an online-virtual environment, although Academic educators play a primary role in the use of online learning environment by students, these students can only utilize those that the educators make available to them, in a specific learning context [4].

Computer Education field offers high-paying careers yet rather challenging, which are more accessible than any other careers. Computing careers are potentially open to individuals with disabilities because of advancements in assistive technology that provide access to computers [5]. Moreover, ICT has unlocked many opportunities for the Hearing-Impaired Individuals, because most jobs were open through the ICT industry. Relating to a research on the Educational opportunities for the Deaf, the goals surrounding the aspects of the Hearing-Impaired Individuals career development, research in this process and professionals training to work with these Individuals; and significant progress towards these goals were achieved [6]. ICT does improve productivity, as it increases activity for the Hearing-Impaired Individuals. In other words, ICT does empower these Hearing-Impaired Individuals, for instance, when the hearing-impaired is texting using mobile, they can express themselves. By using computers, many career opportunities are open up for the Hearing-Impaired Individuals, in areas like Data Entry, Graphics animation, Computer Operations, Computer Programming, Computer Technician, Software testing and development, Web Design Development and IT entrepreneur. There is a wide acknowledgment in computing innovation that requires various workforce of qualified systems designers, information professionals, computer scientists, software developers, information systems analysts, technology teachers, computing faculty, and other computing professionals.
ICT Education is very much essential for the Hearing-Impaired Individuals, together with the sign language used to teach them. While voice is used in a normal-teaching physical class, there are also in some cases whereby the interpreters are available in the classroom too. Supported visual media aids like graphs, charts and tables are frequently used for computer education, as these individuals have to depend more on vision, due to their defect of hearing [7]. Even in operating software, the visual display plan an important role for the Hearing-Impaired Individuals, as only the visual displays can help them understand a task. Since computers are very much adaptable to the Hearing-Impaired Individuals, Computer education does fit for them, mainly for reasons like minimal supervision, enhances deaf-creativity, and computers being Deaf-Friendly. Because these individuals’ have lost their visual concentration, huge majority of the Hearing-Impaired are highly skilled in drawing and designing, thus they excel well in fields like Web Design, Visual Arts and Graphics Animation. This perspective is suitable for the Hearing-Impaired Individuals to learn about computer, as it studies how they interact with the learning materials via online.

2. Research Methodology
This study is descriptive where it explains the current status of a phenomenon, in other words, it interprets the existing scenario that is being studied. This method emphasized on the current practice that exists in a situation, the criteria in the situation, and the process involved forming the situation.

Based on the descriptive method, this study uses a questionnaire whereby the purpose is to collect data from a number of teachers. Moreover, this study also explores the current scenarios in a particular school, by understanding the relationship among the teachers with students, and the teachers’ usage of computers, and interests in teaching ICT courses, mainly courses like Computer Graphics, Multimedia, Web-Design, Animation, and 3D.

This study was carried out throughout the whole of Peninsular Malaysia, Sabah and Sarawak. The location background chosen was the secondary schools consisting Hearing Impaired Individuals of Form 4 and Form 5, for the whole of Malaysia, including Sabah and Sarawak. Altogether, there were 24 schools involved being the research location, which consists of 20 schools from the Peninsular of Malaysia, and 4 schools from the East Malaysia; that executes the Hearing-Impaired Education Program. This means that there were 24 schools that became the location of data collection.

2.1 Research Instruments
For this study, the instrument of Questionnaires was conducted. Questionnaires are a popular research instrument among researchers and respondents because it gives information fast and simple. The importance of questionnaires can be appreciated anywhere although the respondents are geographically dispersed. For the used of Data Analysis, this technique simplifies researcher to code and score the respondents’ answers. Overall, questionnaires has prepared several awareness towards the context, counting the answers given, that is later known as data, organize the data and interprets the data into its own context.

The researcher had used two techniques for the questionnaires. One was with a fixed scaling response set by the researcher based on the study reading, and two was the open-ended questions, which gives the respondents (teachers) a wider space to answer the questions freely. This way, the teachers can justify their opinion appropriately. The aspects of this study were analyzed in accordance with the aspects of the problem stated in this study. All the questions in the questionnaires are simple questions that do not involve many words other than necessary explanation needed.
This questionnaire mainly seeks to explore on the levels of knowledge, use, satisfaction, and most importantly the interests of teachers (who teaches the hearing-impaired students), towards the ICT Education of computer courses, mainly courses like Computer Graphics, Multimedia, Web-Design, Animation, and 3D. Simultaneously it also focused on the existing Computer Education Program that was already exist in some selected schools for the Hearing-Impaired Education Program.

The questionnaire provided consists of 6 parts, (part I): Background information on the teachers, (part II) General information on Computers, (part III) Computers Usage, (part IV) Computers Equipments, (part V) Infrastructure/Facilities of Computer Lab/Equipments, and the last (part VI) is the Opinions/Suggestions.

For the Part I, the demographic respondents must answer the questions related to their demographic data like sex, age, race, form, state, name of school, and subjects taught in school. For Part II until Part IV, the questions are in statements forms, based on the Likert Scaling Scores Values, whereby respondents circle any one number from 1-5 as their choice, in each item given. The statement items presented in the questionnaires are all in positive form, so that it eases the researcher to code and analyze the data. These answers are based on knowledge, feelings, and experiences in the context of Hearing-Impaired Education Program as follows:

1 - if respondents strongly disagree
2 - if respondents disagree
3 - if respondents are not sure
4 - if respondents agree
5 - if respondents strongly agree

Only at the last part, which is Part VI, is the open-ended questions whereby respondents can state their own answers freely.

2.2 Research Sample, Data Collection and Data Analysis

The research sample of teachers involve in this study are the teachers teaching the Hearing-Impaired Students. These teachers are from the schools all throughout Malaysia, including Sabah and Sarawak, who teaches students that suffers from Hearing-Impairment. The respondents of this study are divided into two groups of teachers, which are from schools that offer Computer Classes, and schools that do not offer Computer classes.

For the Data Collection Method, 20 schools were from Peninsular Malaysia, and 4 schools were from East Malaysia, that was involved in the execution of the Hearing-Impaired Education Program. Researcher had started the research from North, including Penang, Kedah, Kelantan, and goes down to Perak, and Kuala Terengganu. Then, researcher started at Central, which are Selangor, Kuala Lumpur, and goes south to Negeri Sembilan, Malacca and Johore. The last destinations were the East Malaysia which are Sabah, and ended with Sarawak schools. All studies were done weekdays, and it took several days for the teachers to complete the questionnaires. Researcher does not wish to disturb the PnP (Teaching and Learning) in each school, therefore each completed questionnaires are submitted based on the teachers’ convenience.

In the process of Data Analysis; the data collection techniques used were the quantitative data; therefore the Statistical Software package for the Social science module (SPSS) program were used to obtain answers to the research questions. In this study, the data analysis procedures were analyzed using descriptive statistics, for the respondents’ demographics. Each variable are analyzed by the use of means and percentages, which are presented in tables and graphs. In summary, the data of this study were analyzed using the Statistic Package of Social Science (SPSS) version 11. This technique simplifies researcher to code and score the respondents’ answers.
Overall, questionnaires has prepared several awareness towards the context, counting the answers given, that is later known as data, organize the data and interprets the data into its own context.

3. Findings
A total of 48 teachers that taught Hearing-Impaired Education participated in this study. From that total, 13 are male teachers (27.1%), while 35 were female teachers (72.9%). The number of teachers in this study was two from each school in Malaysia, and there were 24 schools involved in this study.

For the race category, 36 teachers (75%) were Malay respondents, 7 teachers (14.6%) were Chinese respondents, 1 teacher (2.1%) was an Indian respondent, and another 4 teachers (8.3%) were from other ethnic races, like Kadazan, Iban, Bidayuh, Melanau, etc. For the state category, 8 teachers (16.7%) were respondents from Johore, 6 teachers (12.5%) were respondents from Kedah, 6 teachers (12.5%) were respondents from Perak, 6 teachers (12.5%) were respondents from Kuala Lumpur, 4 teachers (8.3%) were respondents from Sarawak, and the remaining 18 teachers are 2 respondents from each states of Terengganu, Selangor, Negeri Sembilan, Melacca, Pahang, Labuan, Sabah, Penang and Kelantan, with 4.16% respectively.

Based on the 48 respondents throughout Malaysia who are involved answering this questionnaire, 46 respondents answered Yes (95.8%), and another 2 respondents answered No (4.2%), on the question of learning Computer Graphics course via e-learning for the Hearing-Impaired Students. This shows that almost 96% of the teachers agree on the Hearing-Impaired Individuals learning computer graphics online, compared to the other 4% who disagrees.

In Table 1 below, for the questionnaires on the teachers’ interest in ICT courses, majority of the answers were ‘Strongly Agree’ and ‘Agree’. This can be seen clearly in Table 1 / Chart 1.

### Table/Chart1: Teachers’ interest in ICT Courses

<table>
<thead>
<tr>
<th></th>
<th>Freq</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree (Sangat Tidak Setuju)</td>
<td>2</td>
<td>4.2</td>
</tr>
<tr>
<td>Disagree (Tidak Setuju)</td>
<td>1</td>
<td>2.2</td>
</tr>
<tr>
<td>Unsure (Tidak Pasti)</td>
<td>8</td>
<td>16.6</td>
</tr>
<tr>
<td>Agree (Setuju)</td>
<td>25</td>
<td>52.0</td>
</tr>
<tr>
<td>Strongly Agree (Sangat Setuju)</td>
<td>12</td>
<td>25.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

In Table 2 below, for the questionnaires (open-ended question) on having various ICT computer courses online, majority of the answers by the teachers were Graphics courses like Computer Graphics, 3D Animation, Multimedia and Web-Design. This is mainly because the teachers feel that courses that contains attractive graphics, multimedia-supported content, and attractive animation and designs; are more suitable for the Hearing-Impaired students, as these elements catch the attention of the Hearing-Impaired individuals’ vision, compared to the plain black and white graphic-less courses. The percentages of these Computer Courses chosen can be seen clearly in Table 2 / Chart 2 below:
Table 2 / Chart 2: Distribution of various ICT Courses chosen by the teachers

<table>
<thead>
<tr>
<th>ICT Courses</th>
<th>Freq</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Graphics, 3D-Animation, Multimedia and Web-Design, Drawing, Photoshop, Authoring, AutoCad</td>
<td>41</td>
<td>85.4</td>
</tr>
<tr>
<td>Microsoft Office, Basic Computer Literature</td>
<td>7</td>
<td>14.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

4. Discussions

For the open-ended questions, when being asked whether the respective schools offer any computer subjects, 21 teachers responded Yes, and the average responses were courses like Adobe Photoshop, Computer Graphics (only for 3 schools), Basic Computer Literature, and Desktop Publishing. While, the remaining teachers of 27 answered No. Some of the respondents gave explanation that they are very much interested in teaching computer courses in school; however they would have to follow the time-table schedule set by the Ministry of Education. Moreover, due to the inadequate computer equipments and classrooms/labs, computer courses were not offered for them to teach. This problem does not only affect the teachers, but for the students too, as the numbers of interested hearing-impaired students are many, yet impossible to fulfill this desire.

On the questions when being asked about the content that should be included in a portal, various answers were given by respondents. Besides having to learn these computer courses online, other responses of contents that should be included in a portal includes; to have attractive visual graphics with animation and 3D; information on the Deafs, Bahasa Melayu Hand Code (Kod Tangan Bahasa Melayu), Videos showing Sign Language alongside with captions and subtitles, References/Tips for Final exams, Job Opportunities, Education Institution to Further Studies, Blogging, Chatting System, Download/Upload Files, and a membership profile to sign-up for the students, teachers and parents; and a score record of students’ performance.

5. Acknowledgements

The authors would like to express our highest appreciation to Ministry of Education, Malaysia and all the officers and staffs at the schools involved. High appreciation to all teachers for their full cooperation and involvement in providing information and data during this research study was conducted.

6. Conclusions

In conclusion, overall the results proved that most teachers had chosen Computer Graphics as their desired ICT Course online; among other computer courses. Even though some schools that do not have computer courses offered to access anytime, anywhere, to attain them with tutorials, notes, slides etc. The other schools that offers basic Computer Literature are two in Kuala Lumpur, and two in Johore; and when being asked on adding Computer Graphics course to their basic Computer classes, their responses positively shown a deep interests on Computer Graphics course, physically as well as online too, as they were very determined to have their Hearing-Impaired students to learn them virtually.

To breakdown according to schools, a total of 3 schools do offer Computer Graphics Course in their school, a total of 4 schools offer basic Computer Literature courses, and the remaining 17 schools do not have any computer courses at all offered in their schools. The schools offering Computer Graphics are one in Negeri Sembilan, one in Johore, and another in Terengganu. However when being asked about having this course available online, most teachers optimistically agree that this can help the hearing-impaired students to
them at all, still do wish to have these courses taught in their schools. Some do claim that the ICT courses are being taught for the Normal-Hearing students, however not for the hearing-impaired individuals. An equal teaching and learning should exist for both the normal students and the hearing-impaired students. This will give the hearing-impaired students opportunities to enable them master the computer proficiency too; and develop own potentials concurrently. The computer classes should not be divided unfairly to only for the normal students, and neglecting the hearing-impaired students. This kind of imbalance will only affect the confidence and faith of the hearing-impaired students.

Many opinions were raised individually from the respondents, from the questionnaires conducted. In terms of ICT Education, computer courses were definitely a demanding major, and this questionnaire also proven that learning them online was resulted in a positive form.

References: