The Use of Information Technology in Meeting Instructional Needs for Special Education

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Abstract

Information technology (IT) is now widely available in many countries, particularly in Malaysian schools, to assist special education teachers in many ways. However, the available literature worldwide suggests that most preparatory programs for teachers do not sufficiently equip them with IT skills. This study investigated the use of IT in meeting instructional needs for special education curriculum. The study explored the main curriculum domains for special teachers' instructional needs, analyzed their current level of computer and IT knowledge and its usage in meeting their teaching needs. A mixed-method approach using questionnaires and interviews was used in the study. Questionnaires were sent to 120 special education professionals in 15 schools and education centers in Selangor, Malaysia. The findings indicate that the cognitive and communication domains were the principal areas for instructional needs. Professionals in supporting roles expressed a desire for a significant amount of IT-based resources for the communication domain ($p<0.05$). Knowledge of the World Wide Web was statistically significant among female professionals, those in supporting roles, and Bachelor's or Master's degree holders ($p<0.05$). Current usage of IT-based resources indicated that the World Wide Web was quite significant among female professionals and those in supporting roles ($p<0.05$). Professionals with Bachelor's or Master's degrees also reported current usage of the World Wide Web and online databases as significant. Foresighted education managers could plan for clear future guidelines for providing the right IT infrastructure; systematic and regular IT training programs as well as reliable technical support services for their teaching staff.

Keywords: Information Technology, Special Education Curriculum, Instructional Needs, Instructional Materials, Special Needs resources, Learning Disability, Special Education Professionals, special education resources.

1. Introduction

Information technology (IT) is regarded as one of the main hallmarks of the 21st century. The era resulted in the development and materialization of the personal computer that was introduced in the late 1970s (Smith and Meyen, 2003). The new scenario created a lot of excitement, enthusiasm as well as expectations among educators. This was especially important for special education professionals. So what is special education?

Special Education is a term applied to the individually planned and systematically monitored arrangement of physical settings, special equipment and materials, teaching procedures, and other interventions designed to help learners with special needs achieve the greatest possible personal potential of leading an independent life as far as possible (Copenhaver, 2004).

Therefore, specialized instruction is planned based on learning deficiencies determined by a team of experts. Hence the program recommended must be precisely matched to fit individual educational abilities and needs, as well as adapted to the child's learning style. As such, special needs students are unable to learn in a regular or standard classroom.

Historically, however, scientific attempts to educate children with learning disabilities originated in the efforts of Jean-Marc-Gaspard Itard, a French physician and otologist. In his classic work *The Wild Boy of Aveyron* (1807), he narrates his five years effort to train and educate a boy who had been found living in the wild in the woods of Aveyron (Special Education, 2007).

Today, Malaysia is one country that is right at the forefront in terms of advancing the application of information technology in many aspects of society including the delivery system in education.

Unlike many other countries, Malaysia is a host to one of the most ambitious information and communication technology projects known as the Multimedia Super Corridor (MSC). In tandem with this development, various educational projects such as the smart school project are being pursued. Therefore, for a country poised to become a fully developed nation by the year 2020 (Mahathir, 1991), it is important to explore and assess its manpower competency levels and needs in terms of IT skills, knowledge and experiences.

Special education teachers are among those manpower groups that face a lot of challenging situations in the process of executing their responsibilities on a daily basis. Yet some of the challenges could be overcome if IT-based resources and services were carefully utilized in the instruction process.

The main concern that led to the undertaking of this study was that there was little evidence of documented studies that highlighted or explained issues surrounding the application of IT in special schools in Malaysia. Available research worldwide in teacher education indicates that neither pre-service nor in-service teachers have kept pace with the rapid changes in technology developments (Bansavich, 2005). Furthermore, Sven (2006) noted that there was a general lack of satisfaction with IT skills among the teachers themselves in his qualitative study, which focused on newly certified teachers' use of information technology.

Based on this background, this study aims to fulfill the following objectives:

a) Explore the main curriculum domains for special education teachers' instructional needs.
b) Identify and analyze the current level of computer and IT knowledge among special education professionals in Malaysia.

Examine how special education professionals use their current level of computer and IT knowledge to meet their instructional needs.

2. Previous Research

2.1 Information Technology and Special education

It is important to note here that information technology (IT) has the potential to enhance the curriculum and program activities in many ways. Firstly, computers provide a new dimension with current vibrant ways of learning and also save teachers' instructional and preparation time (Lee and Vail, 2005). Special education teachers can collaborate and communicate with their peers (Donlan, 1998) through the cyberspace while IT provides them with alternative resources and strategies to individualize lessons and activities (Coughenour, 2002).

Secondly, IT has the potential to play a significant role in the education process of students with learning disabilities (Jerome and Barbetta, 2005), especially when used as a supplement to the traditional instruction process (Hall, Hughes and Filbert, 2000). IT provides an effective mode of instruction and could be used to generate instructional materials necessary for early academic skills (Hichcock and Noonan 2000). Continued research and innovation in information technology have led to the development of more efficient educational software that have been put to use in special education for various instructional purposes. Probably, online databases for evidence-based instructional strategies for teachers of students with learning disabilities are another development with lots of potential (Hodges et al., 2007). Moreover, electronic products and computer software systems have evolved to become smart, adaptive as well as capable of personalizing the instructional process based on specific learners and their capabilities (Braddock et al., 2004).

2.2 Benefits of Information Technology to Instruction

Several research studies have investigated the benefits of integrating computer-based applications and instruction. In general, they indicated that computers could provide students with vibrant and new ways to learn (Lee and Vail, 2005) through accurate and valid learning experiences (Office of Technology Assessment, 1995) and are capable of boosting academic progress and achievement by sustaining learning in a wide array of skill areas (Wehmeyer et al.., 2004).

Computer-based strategies offered step-by-step instructions in task performance to boost user confidence (Lancioni, O'Reilly and Campodonico, 2002) and increased students' inquiry and analytical skills (Honey and Henriquez, 1993). In addition, computer-based instruction, with prompting devices, improved focus on the learning process, accuracy and independence in accomplishing tasks (Davies, Stock and Wehmeyer, 2002a). It also promoted better time management in vocational instructional settings (Davies, Stock and Wehmeyer, 2002b).

Information technology enhances learning by providing students with extra help in the skill areas in which they are deficient (Coughenour, 2002). Computer-based applications offer individualized support to meet the diverse needs of students, guide them towards higher development of competencies by minimizing their frustration and promoting interests in their tasks (Cheng-Fang, 2004). IT has achieved this endeavor by availing support in the learning process through specialized computer training programs and tools (Stock, Davies and Wehmeyer, 2004).

The concept of utilizing virtual technologies in the classroom can boost students' morale, by making abstract learning concepts more concrete, enabling students to progress through an exciting experience at their own pace, and encouraging active participation rather than passive observation (Pantelidis, 1995). As such, IT can provide support facilities to benefit students in the classroom in order to remain on task, remind them of pending

assignments, and provide access to information on the computer or the Internet (Braddock et al., 2004).

Computer-based applications have also influenced students' understanding and respect for cultural differences (Gersh, 1994), improved students' attitudes and communication skills (Chiu, 1996; Follansbee et al., 1996), and increased the quality of student writing (Wright, 1991; Lewis, 2000). Other facilities, for instance the Internet, can help students to extend their thinking as well as reasoning skills and achieve multiple objectives within a single lesson (Harris, 2000).

As for the teachers, the benefits include increased collaboration and communication with their peers (Donlan, 1998; Honey and Henriquez, 1993) and `fingertip' access to research, online experts, and many curriculum resources (Barron and Ivers, 1998). In this area, computer programs can prove to be valuable tools to teach and provide practice of new vocabularies or concepts in general education classrooms. They can also save teachers' instructional and preparation time (Lee and Vail, 2005). In addition, computer-based applications help teachers to realize job satisfaction by allowing them to devote sufficient attention to all students and offering them alternatives to individualize lessons (Coughenour, 2002) for particular students.

Furthermore, computer based facilities can help teachers in introducing and implementing more sophisticated applications in the process of integrating technology into the learning environment (Pearson and Swain, 2001). These programs can assist teachers in promoting higher-level critical thinking abilities among students (Gorski, 2005). At the same time, by promoting digital and multimedia inclusion in their instructional strategies, teachers can also expose their students to a variety of electronic resources and engage them in activities that use technology for communication, research, problem solving and decision-making (Swain and Pearson, 2002).

Other IT-based facilities or tools such as the Web-based book marking service such as www.iKeepBookmarks.com can help teachers to enhance the curriculum and save time during the instructional process. Such a service can also add value, interest, excitement and, above all, improve students' attention span and motivation during the learning process Moreover, such a service could enable students to access the very best of the web material for classroom instruction and learning purposes (Forbes, 2004).

Additionally, the World Wide Web hosts an innumerable amount of sites, which provide resources and activities that support student learning. As a result, an increasing number of special education teachers have acquired sufficient skills in browsing and searching the World Wide Web for instructional materials (Gardener and Wissick, 2002) that make learning more interesting and meaningful.

2.3 Current Use of IT-based Resources for Instructional Needs

Research has indicated that children with learning disabilities contribute as one of the largest population of students that require special education services; however, as this population continues to grow, so does its need to utilize the Internet for educational purposes (Marie, 2002). The World Wide Web has emerged as one of the most important resources capable of providing multitudes of teaching and learning opportunities. Today, web sites have evolved in such a way that they now include hyperlinks, text, digital pictures, graphics, audio, animations, and video clip applications. By providing a variety of tools, it makes it easy to design, customize, develop and implement creatively tailored materials and learning opportunities that cater for the needs of specific individuals with learning disabilities. Therefore, a clear advantage of the World Wide Web is its capability to function as a tool in

advancing what teachers can do to provide all students with access to the general education requirements (Smith and Meyen, 2003).

In another study, the use of Web-based bookmarks was described as one of the most effective ways of using Internet content to support reading and other literacy activities for kindergarten and learners with special needs. It was noted that even children who could not read were able to recognize pictures as well as comprehend and enjoy what they could see (Scott, 2003). By using Web-based bookmarking as a component of instruction, teachers were able to provide visual cues for their learners and also enabled them to present highly motivating and meaningful reading materials from the Internet.

In an attempt to improve special education services, EDmin.com (2002) released a web- based resource to help K-12 educators in improving special needs services. This online resource provided support for managing essential but time consuming daily routine tasks. For instance, the software application was used to monitor individual student education plans. Through this feature, educators could access individual student plans at any time regardless of their location. Therefore, teachers were able to track performance results, document and detect the most effective interventions for a particular student. Moreover, the same tool allowed teachers, case workers and school administrators to identify which student had special emotion, intellectual or physical needs in order to qualify for exceptional services.

Polirstok and Lesser (2003) conducted a study and compiled some useful online information, resources and interventions useful for those professionals and caregivers working with students with such traits. They provided addresses or URLs, which could be used to access relevant websites on autism and autistic spectrum disorders and resources for instructional strategies, behavior management and therapeutic interventions. Other information also included websites for parent support organizations and treatment centers operating within the United States of America.

Earlier, Driskell (1999) used a constructivist approach to instructional design to develop an electronic resource. The resource was a website better known as the Houston Educator Lesson Plan Exchange and Resource (HELPER). This hypermedia website for lessons proved to be a very important reference source particularly for the classroom teachers. Teachers accessed the website to get all kinds of information to help in improving the way they planned the size and content of their lesson plans. This facility also provided information that could be used by teachers to create, customize and modify their learning environments in away that suited their local teaching conditions.

Smith and Meyen, (2003) came up with the idea of organizing resources at TrackStar(http://trackstar.hprtec.org/). This was an innovative online resource, which enabled teachers to organize and annotate websites into lessons, assignments or instructional resources. TrackStar allowed users to organize favorite web sites into tracks under specific topics and made them accessible to any one with Internet access. Since tracks were organized and catalogued by grade level and key word (e.g. primary, special education), they provided teachers with just-in-time and content specific resources for use in their instructional environments.

Edyburn (2001) argued that technology has re-engineered the tools available for teachers and principally altered how they can teach. He explained that the Internet provides a new dimension in the instructional process and helps teachers in a variety of ways. For instance, electronic databases and journals allow them to access research-based instructional methods, behavior management techniques, and other classroom intervention strategies from almost anywhere at any time. E-mails, chats, bulletin board and other Internet based communication tools have enabled teachers to have constant access to professionals and experts in special education. Such valuable avenues for communication and collaboration

have helped teachers to access and acquire valuable and needed information. Also, instructional websites allowed both general and special education teachers to facilitate student instruction without the need to acquire specialist knowledge or expertise in a particular content-based curriculum.

Yook (2000) compared the effects of software program instruction versus textbook instruction. The study was focused on students with emotional and behavior disorders. Some titles from a series of contemporary children's books were selected for the study. He selected two titles for the software program and two for the text-based reading. Their reading performance and on-task behaviors were analyzed. The results revealed that after using the reading software program, the improvement in reading fluency and accuracy of the students were higher and faster.. The study provided some useful information on how to handle activities related to pronunciations, spellings, intonation and phonetics. The study also suggested some text-to-speech features, which could make the stories seem more real to the students than when they simply read the text from the books.

In a related study that expounded the teaching and learning potentials provided by the World Wide Web, certain benefits offered by online instructional resources were highlighted. Wissick and Gardner (2002) explained that Internet based applications combined IT features in a cost effective and accessible format designed with considerations for group as well as individual learners. Therefore, such resources have provided the students with special needs the extra practice to promote mastery of skills. In addition, the resources helped students in the development of writing abilities to promote understanding in content-based curriculum

Stover (2001) studied the potential of hand held computers in education. He explained that these computers were an important development in educational technology. Due to their portability, user friendliness and accessibility, principals could use these computers to monitor administrative aspects of the school all the time. Teachers could use them to take notes and grades during the day. Special education teachers could use these computers to easily access information pertaining to student progress, student's individualized education plan, goals, classroom activities and relevant teaching materials. They could store and access information regarding the student's evaluation, progress and medical alert wherever possible.

Falicki (2000) highlighted a comprehensive courseware program for special student populations. She explained the usefulness and effectiveness of the web-based program and how it helped students to achieve their goals and advance in their study programs. The web-based courseware covered areas such as language, arts, social studies, foreign languages, mathematics and science. This web-based courseware helped special education teachers to get relevant information pertaining to lesson planning, classroom exercises, extension activities, games and quizzes and helped to create a student evaluation and tracking system

3. Research Questions

Based on this background, this study aims to fulfill the following objectives:

a. Explore the main curriculum domains for special education teachers' instructional needs.

b. Analyze the current level of computer and IT knowledge among special education professionals in Malaysia.

c. Examine how special education professionals use their current level of computer and IT knowledge to meet their instructional needs.

4. Research Method

This study can be classified as an exploratory-descriptive study. It was envisaged with an attempt to explore and investigate the use of information technology based resources in

meeting instructional needs for special education program activities in special schools in Malaysia.

According to Blurtit (2007) and Sekaran (2000) an exploratory study is described as an approach undertaken when very little or nothing is known regarding the situation at hand. Alternatively, this kind of research is conducted when no information is currently available on how a similar problem or research issues have been handled and resolved in the past. On the other hand, a descriptive study is the one which tries to define or measure a particular phenomenon, usually by estimating the strength or intensity of a behavior or the relationship between two behaviors (Dane, 1990).

In order to achieve the goals of this study, the researcher adopted a mixed-method approach. For this research, the method includes both qualitative and quantitative techniques of collecting data. Patton (1990) suggested that a combination of methodologies strengthened a research design. Both qualitative and quantitative researches provide complimentary types of information. Moreover, the use of two or more methods makes it possible to adopt a multidimensional approach whereby different aspects of the same research questions are addressed (Fitzpatrick, Secrist, and Wright, 1998).

Therefore, the strengths and weaknesses of qualitative and quantitative approaches can complement each other to achieve desired results (Davies, 1997; Neuman, 2000).

The first question asked about their main curricular domains for instructional or information seeking practices. This question was to explore what the study participants thought were important curricular domains in special education especially for their individual schools. The second question asked about their current level of computer and IT knowledge, followed by how they used this knowledge to meet their instructional responsibilities. The participants' responses were analyzed using both the *t*-test and ANOVA as it was necessary to establish whether there were any significant differences among them. As for the interview data gathered through focus group dialogues, the main ideas were identified by considering the choice and meaning of words, based on the context and consistency of responses (Krueger, 1988)

4.1 Scope of the research

The study was intended to investigate the current IT and computer knowledge levels among special teachers / educators, and how they used it to access or retrieve information for program activities. It was conducted in and restricted to special schools or learning centers located in the state of Selangor, Malaysia. The schools included were associated with serving children with unique features including down syndrome, autism, attention deficiency hyperactivity disorder (ADHD), behavior problems, mental retardation, and emotional disabilities.

4.2 Sampling

The population for this study comprised of 120 special education professionals. This included teachers, assistant teachers, program coordinators, speech therapists, psychologists and other related staff such as physiotherapists. These teachers and professionals were drawn from a total of 15 special education schools or learning centers from around the Kuala Lumpur Federal Territory and the Klang Valley areas, in Malaysia.

The study participants were selected from these locations as they were the most ideal with a good cross-section of the various ethnic groups as well as urban and rural dwellers. As there was a good IT infrastructure in the selected geographical location of the study; it was presumed therefore that the special education professionals in these schools were relatively well exposed to IT facilities in general, and had good access to the use of computers particularly in their schools.

5. Results

The profile of special education professionals in this study is indicated in Table 1. Overall, female respondents (69.2%) and male respondents (30.8%) participated in this study, thus suggesting that more female teachers were employed in special schools. Also, most of the respondents were less than thirty years old (41.3%), had at least a diploma in special education (41.4%) and with less than 5 years of teaching experience (43.3%).

Table 1: Demographic Information about the Survey Respondents ($n = 104$)

Respondents	Frequency	Percentage
Gender		
(n = 104)		
Female	72	69.2
Male	32	30.8
Total	104	100
Age category of respondents		
(n = 104)		
Less than 30yrs	43	41.3
30– 40 yrs	41	39.4
Above 40 yrs	20	19.3
Total	104	100.0
Qualifications		
(n = 104)		
Diploma in Education	43	41.4
Bachelor's or Master's Degree	30	28.8
Other Qualifications	31	29.8
Total	104	100.0
Experience in Special Education		
(n = 104)		
Less than 5yrs	45	**43.3**
5-10 yrs	34	32.7
Above 10 yrs	25	24.0
Total	104	100.0
Staff Category		
(n =104)		
Program Administrators	20	19.2
Teachers	60	57.6
Supporting Staff	24	23.0
Total	104	100.0

Research objective One:

Table 2 presents staff category mean differences based on required amount of information on curricular domains. The results indicated that the "social-communication" domain was statistically significant at 0.05 significance level with (F = 2.957, p<.036). It was the professionals in supporting roles that rated the "social-communication" domain significantly higher (Mean = 5.38) than the program administrators (Mean = 5.05) and teachers (Mean = 4.82).

Table 2: Staff Category Mean Differences based on Required Amount of Information on Curricular Domains (*n* = 104)

Domains	ADM (Mean)	TCR (Mean)	SPT (Mean)	df	F	*p*-value
Fine Motor	3.63	3.82	3.94	3	0.881	0.454
Gross Motor	4.50	4.53	4.59	3	0.054	0.983
Adaptive	4.66	4.92	4.91	3	0.465	0.629
Cognitive	5.38	5.38	5.24	3	0.320	0.811
Social-Communication	5.05	4.82	5.38	3	2.957	0.036*
Social Domain	.5.05	5.06	5.29	3	2.372	0.075

Note: Measurement was done on a 7-point interval scale in which 1 = not important at all to 7 = most important

ADM is an abbreviation for special education program administrators with n = 20; TCR is an abbreviation for Teachers in special schools with n = 60; SPT is an abbreviation for professionals in supporting roles in special schools with n = 24.

* The test is significant at *p* = .05 level.

Furthermore, Table 3 shows that the "adaptive domain" was statistically significant at 0.05 significance level with (F= 4.150, *p*<.019). Moreover, the "cognitive domain" was also statistically significant at 0.05 significance level with (F= 4.570, *p*<.013). This means that professionals with other qualifications rated the adaptive domain significantly higher (mean = 5.13) than diploma holders (mean = 4.67) and Bachelors or Masters' holders (mean = 4.90). On the other hand, diploma holders rated the "cognitive" domain substantially higher (mean = 5.51) than BA or MA holders (mean = 5.37) and those with other qualifications (mean = 5.13).

Table 3: Respondents' Qualification Mean Differences based on Required Amount of Information on Curricular Domains (*n* = 104)

Domains	Diploma (Mean)	BA or MA Degree (Mean)	Other Qlfcns (Mean)	df	F	*p*- value
Fine Motor	3.91	3.80	3. 58	3 104	1.529	.222
Gross Motor	4.47	4.33	4.84	3 104	2.866	.062
Adaptive	4.67	4.90	5.13	3 104	4.150	.019*
Cognitive	5.51	5.37	5.13	3 104	4.570	.013*
Social-Communication	5.09	5.03	5.13	3 104	.171	.843
Social Domain	5.16	5.17	4.97	3 104	.833	.437

Note: Measurement was done on a 7-point interval scale in which 1 = not important at all to 7 = All available Information Educational qualifications include: Diploma, BA is an abbreviation for Bachelor of Arts Degree;

MA is an abbreviation for Master of Arts Degree; Other Qlfcns is an abbreviation for other qualifications not mentioned eg. Certificates

* The test is significant at p = 0.05 level

Research Objective two:

In an attempt to examine the current level of computer and IT knowledge, Table 4 shows that based on the mean differences for the current level of knowledge on IT-based information resources, female professionals rated their knowledge of the World Wide Web to be significantly higher as compared to their male counterparts (*p* <.05)

Table 4: Gender Mean Differences based on Current Level of Computer and IT Knowledge (n = 104)

IT-based Information Resources	Male (Mean)	Male (Rank)	Female (Mean)	Female (Rank)	t-value	*p*-value
World Wide Web.	3.78	1	4.81	1	2.424	0.017**
Database searching	3.12	2	3.11	2	-0.123	0.902
E-mail communication	1.72	3	1.71	3	-0.107	0.915
Newsgroups, e-journals	1.28	4	1.31	4	0.320	0.749

Note: Measurement was done on a 7-point interval scale in which 1 = not able - to 7 = Excellent

Note* The test is significant at *p* = .05 level. Ranking is based on the mean, the higher the mean the more respondent knowledge and experience suggested on the resource.

Furthermore, Table 5 indicates that the professionals in supporting roles (such as speech therapists, physiotherapists) indicated that they had a significantly higher level of World Wide Web knowledge than either program administrators or teachers. In this regard, one speech therapist stated that: "…the World Wide Web has continuously empowered us with more current knowledge and resources for speech therapy activities…"

Table 5: Staff Categories Mean Differences based on Current Level of Computer and IT Knowledge (n = 104)

IT-based Information Resources	ADM (Mean)	TCR (Mean)	SPT (Mean)	df	F	*p*-value
E-mail communication	5.21	4.93	5.41	3 104	1.211	.310
World Wide Web	4.76	5.20	5.67	3 104	3.560	.017*
Database searching	3.63	3.92	3.65	3 104	.787	.504
Newsgroups, Listservs.	3.63	3.33	3.29	3 104	.746	.527

Note: Measurement was done on a 7-point interval scale in which 1 = not able - to 7 = Excellent. Ranking is based on the mean. A higher mean indicates that more knowledge has been expressed on the resource. ADM is an abbreviation for special education program administrators; TCR is an abbreviation for Teachers in special schools; SPT is an abbreviation for Professionals (including speech therapists, psychologists, physiotherapists) in supporting roles in special schools.

* The test is significant at p = .05 level.

In addition, Table 6 demonstrates that respondents with a Bachelors' or Masters degrees rated their knowledge of the World Wide Web to be higher and was statistically significant as compared to other resources (F=4.698, p<.011); and among respondents with other qualifications. One of the interview participants summed up the scenario as: "…a source of valuable information when preparing to conduct trainings…….and provided useful and up-to-date information for research….." Another participant added that: "… provides enormous resources for planning program activities…"

Table 6: Qualifications Mean Differences based on Current Level of Computer and IT Knowledge (n = 104)

IT-based Information Resources	Diploma (Mean)	BA or MA (Mean)	Other Qlfcns (Mean)	*df*	*F*	*p-value*
E-mail communication	4.74	5.17	5.39	3 104	2.872	.061
World Wide Web	4.83	5.51	5.19	3 104	4.698	.011**
Database searching	3.95	3.77	3.61	3 104	1.272	.285
Newsgroups, Listservs.	3.56	3.33	3.23	3 104	1.451	.239

Note: Measurement was done on a 7-point interval scale in which 1 = not able - to 7 = Excellent. Ranking is based on the mean. A higher mean indicates that more knowledge has been expressed on the resource. Educational qualifications include: Diploma, BA is an abbreviation for Bachelor of Arts Degree; MA is an abbreviation for Master of Arts Degree; Other Qlfcns is an abbreviation for other qualifications not mentioned eg. Certificates. * The test is significant at p = .05 level.

Research Objective three:

The use of the current knowledge of computer and IT resources among special education professionals was noted in the study. For instance, both the survey questionnaire responses and group interview participants revealed that some electronic journals contents not only helped to cater for their professional development agenda but also their curriculum strategies. In relation to this, one of the dialogue participants stated that: "…some of the materials from electronic journals were quite useful for curriculum planning, classroom instruction strategies and professional development…" Hence, Table 7 contains some examples that were cited in this regard.

Table 7: Example of Electronic Journals accessed by Special Education Professionals (n = 104)

Electronic Journals	Frequency	Percentage
1. Journal of Autism and Developmental Disorders	33	32.0
2. American Journal of Intellectual and Developmental Disabilities (AJIDD)	27	26.0
3. Journal of Learning Disabilities	25	24.0
4. Focus on Autism and Other Developmental Disabilities	21	20.1
5. Medicine On-line	17	16.3

Furthermore, as can be seen in Table 8, the usage of the World Wide Web was highly important among professionals in supporting roles (p < .05) as compared to program administrators and teachers. A speech therapist remarked during the group dialogue sessions that: "…we use the World Wide Web on a regular basis when preparing materials for program activities….there are lots of choices and varieties of materials for all categories of special children……one must know how to access them…"

Table 8: Staff Category Mean Differences based on Current Use of IT-based Information Resources (n = 104)

Domains	ADM (Mean)	TCR (Mean)	SPT (Mean)	df	F	*p*-value
World Wide Web	4.83	5.00	5.70	3 104	6.239	.003*
E-mail communication	4.78	4.71	4.35	3 104	.652	.523
Database searching	4.66	4.92	4.91	3 104	.465	.629
Newsgroups, e-journals	3.17	3.18	2.87	3 104	.315	.731

Note: Measurement was done on a 7-point interval scale in which 1 = not important at all, - to 7 = most important.

Ranking is based on the mean. A higher mean indicates that more usage of the resource was reported by a specific group of respondents and vice versa. ADM is an abbreviation for special education program administrators; TCR is an abbreviation for Teachers in special schools; SPT is an abbreviation for professionals in a supporting role in special schools such as speech therapists. * The test is significant at p = .05 level.

Finally, the data in Table 9 show that special education professionals with Bachelors' or Masters degrees indicated that they used both databases and the World Wide Web quite significantly (p < .05) when searching resources for special education programs. In this regard, one participant in the group interview dialogues pointed out that: "… a website or a database with well researched, documented and up-to-date ideas, opinions or studies can be an important reference tool for us when crafting program activities…" Another participant added that: "for most of us in specialized areas …involved in conducting trainings. engaged in academic research databases and the World Wide Web provide access to current research findings"

Table 9: Qualification Mean Differences and Current Use of Computer and IT Knowledge

IT-based Information Resources	Diploma (Mean)	BA or MA Degree (Mean)	Other Qlfcns (Mean)	*df*	*F*	*p- value*
E-mail communication	5.95	6.00	5.84	3 104	.235	.791
World Wide Web	4.83	5.51	5.19	3 104	4.698	.011*
Database searching	3.46	4.53	3.93	3 104	4.630	.012*
Newsgroups, Listservs.	3.95	3.33	3.23	3 104	1.451	.239

Note: Measurement was done on a 7-point interval scale in which 1 = not Important – to 7 = Most important . Ranking is based on the mean. A higher mean indicates that more usage of the resource was reported by a specific group of respondents and vice versa

Educational qualifications include: Diploma, BA is an abbreviation for Bachelor of Arts Degree; MA is an abbreviation for Master of Arts Degree; Other Qlfcns is an abbreviation for other qualifications not mentioned eg. Certificates

* The test is significant at *p* = .05 level.

6. Discussions

On the whole, whether the statistical significance for particular domains really reflected their importance in relation to other domains could still be debatable. Probably what needs to be noted is the explanation by one experienced special teacher who argued that: "…*it was not a question of domain importance but rather a need of urgency as far as the skill deficiencies were concerned for individual students…..in any school…*"

On the other hand, the statistical significance regarding the use of the World Wide Web was in congruence with a study by Gardner and Wissick (2002). They demonstrated that many special education teachers were competent in retrieving information resources from the World Wide Web. However, the knowledge possessed by individual teachers to access online materials could be dictated by other factors such as; staff training programs on the use of IT facilities, availability and accessibility of computers and a dependable technical support structure.

Finally, the reported higher percentage in the use of the World Wide Web by special teachers could be explained by the fact that, they deemed it helpful in supporting curriculum accommodations for students with learning disabilities (Gardner and Wissick, 2002) compared to other resources. Moreover, other Technology-Enhanced Learning Environments on the Web (TELE-Web) which offered new instructional possibilities (Englert, Wu, and Zhao, 2005) could have been among other reasons behind this scenario.

7. Summary and Concluding Remarks

The study presented some useful data regarding current knowledge and use of IT in special education. For special teachers to be able to utilize IT facilities in performing their duties in schools, they should possess a mix of IT skills and knowledge. Hence, it is recommended that those in charge of managing and planning teacher training programs should provide a new direction for future teacher preparation as well as in-service training programs. Moreover, making computers and IT facilities accessible and providing a reliable technical support structure would make the situation better for special needs teachers. Finally, it is recommended that the study be conducted in other states as well to explore if the situation was the same or different to facilitate better future planning for national teacher training institutions.

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