ASSESSMENT OF NEEDS AND PROBLEMS OF THE BSIT STUDENTS ON COMPUTER PROGRAMMING SKILLS

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ABSTRACT

The study aimed to determine the extent of needs and problems of Bachelor of Science in Information Technology (BSIT) students on computer programming skills; the relationship between the perceived needs and perceived problems; and the relationship between computer programming skills with the extent of needs and problems. The study was conducted to enhance the computer programming skills of BSIT students of the Benguet State University by addressing perceived needs or problems.

Results show that there were facility-related, curriculum-related and teacher related aspects considered to be of much need and of great problem by students. The perceived needs are related to perceived problems. Facility-related and Curriculum-related needs are related to computer programming skills on IT subjects such as Problem Solving & Programming, Microcomputer Systems Organization, Database Management System and Object-Oriented Programming & Technology skills.

Keywords: assessment, information technology, computer programming skills

INTRODUCTION

Information Technology (IT) plays an increasingly significant role in the lives of today's undergraduates, who use technology extensively in course, job, and recreational activities.

Traditional educational practices no longer provide prospective teachers with all the necessary skills for teaching students to survive economically in today's workplace. (United Nations Educational, Scientific and Cultural Organization 2008)

Today's classroom teachers need to be prepared to provide technology-supported learning opportunities for their students. Being prepared to use technology and knowing how that technology can support student learning have become integral skills in every teacher's professional repertoire.

Teachers need to be prepared to empower students with the advantages technology can bring. Schools and classrooms, both real and virtual, must have teachers who are equipped with technology resources and skills and who can effectively teach the necessary subject matter content while incorporating technology concepts and skills. Interactive computer simulations, digital and open educational resources, and sophisticated data-gathering and analysis tools are only a few of the resources that enable teachers to provide previously unimaginable opportunities for conceptual understanding.

Quality IT education is achieved if the needs are well provided and taken cared of and problems are mitigated. Students acquire high-level skills and knowledge in a learning environment

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with comprehensive resources, competent teachers and effective curriculum. Information Communication Technology (ICT) is dynamic and fast changing that new hardwares, softwares and applications emerged every year. Upgrading and procuring resources are compulsory to be up-to-date with the contemporary computing. Teachers impart IT skills and knowledge that prepare the students to be competent with the requirements and readiness for IT jobs as needed by companies. The IT curriculum must provide the necessary training that matches the demands of the IT industry.

The ability to use ICT effectively and appropriately is now seen as essential to allow learners to acquire and exploit information within every sphere of human activity. It can be assumed that specific forms of ICT will change with time. However, the need to be able to evaluate and use ICT purposefully will remain the key to full participation in an information society. (The Faculty Management of Robert Gordon University, n. d.)

Through the ongoing and effective use of technology in the schooling process, students have the opportunity to acquire important technology capabilities. The key individual in helping students develop those capabilities is the classroom teacher. The teacher is responsible for establishing the classroom environment and preparing the learning opportunities that facilitate students' use of technology to learn, and communicate. Consequently, it is critical that all classroom teachers are prepared to provide their students with these opportunities.

ICT skills also need to be matched with industry awareness and understanding. Modern firms need more than just highly developed technical staff. They also need employees with soft skills (communication, teamwork, empathy) and who are familiar with the latest business models and associated processes and technology ownership concepts (ICT Forward Team 2007).

According to ECAR (EDUCAUSE Center for Applied Research) study of undergraduates and Information Technology, students extensively use technology for school, work, and recreation. They spend, on average, almost 20 hours per week doing online activities. Over 90% of them use the college or university library website and presentation software such as PowerPoint. Most students also use spreadsheets (85.9%), Social Networking Sites (85.2%), text messaging (83.6%), course management systems (82.3%), graphics software such as Photoshop or Flash (73.9%), and instant message (73.8%). Approximately one-third of students contribute content to wikis or blogs or use video or audio creation software. For 18 -19 year olds, 87.3% use Social Networking Sites, 76.3% use text messaging, and 57.5% use instant messaging several times a week or more often.

In each of the past three years' studies, students prefer only a moderate amount of IT in their courses. In 2008, 59.3% again say they prefer moderate IT in courses. However, there is a cadre of students who prefer extensive or exclusive IT in their courses (25.0%), as well as some who prefer limited or no IT in courses (15.8%).

ECAR also asked students which technologies were used in their courses at the time of the survey (February-April 2008). Students report that the college or university library website (67.7%) was the most used technology in their courses, followed by presentation software (63.5%). Many students used spreadsheets (43.3%). Seniors report higher usage of presentation software and spreadsheets in their courses. Between 10% and 20% of students used wikis, graphics software, Social Networking Site, and instant messaging in their courses.

In order to gauge student perceptions about which aspects of technology most affect their academic experience, ECAR asked about the impact of IT on enhancing student engagement in courses, increasing convenience, improving learning, and preparing them for the workplace. Students report the most agreement with the statement "IT makes doing my course activities more convenient" (65.6%). Only about 46% agree that the use of IT in their courses improves their learning (Caruso, 2008).

Students perceive that more instructors need to use IT effectively in courses. Student comments – both positive and negative – clearly indicate that how instructors use IT is foremost in the minds of students (Caruso, 2008).

Teachers need continuing training as the technology changes, as new and more effective applications are developed, and as more is learned about learning with technology. Further, teachers must choose a software program that they have decided will help them and supplement their instruction while keeping their curriculum requirements always in the forefront (Bennet, 1999).

Conceptual Framework

The independent variables of this study are the needs & problems and subject grades of the different computer programming subjects. The dependent variables are level of BSIT students' needs, degree of problems encountered by BSIT students, relation of the level of perceived needs to the degree of problems, relation of the level of students' needs to the computer programming skills. The expected outcomes are improved IT teaching and learning process, and produced globally competent IT graduates.

The relationships among these variables are shown below.

Objectives

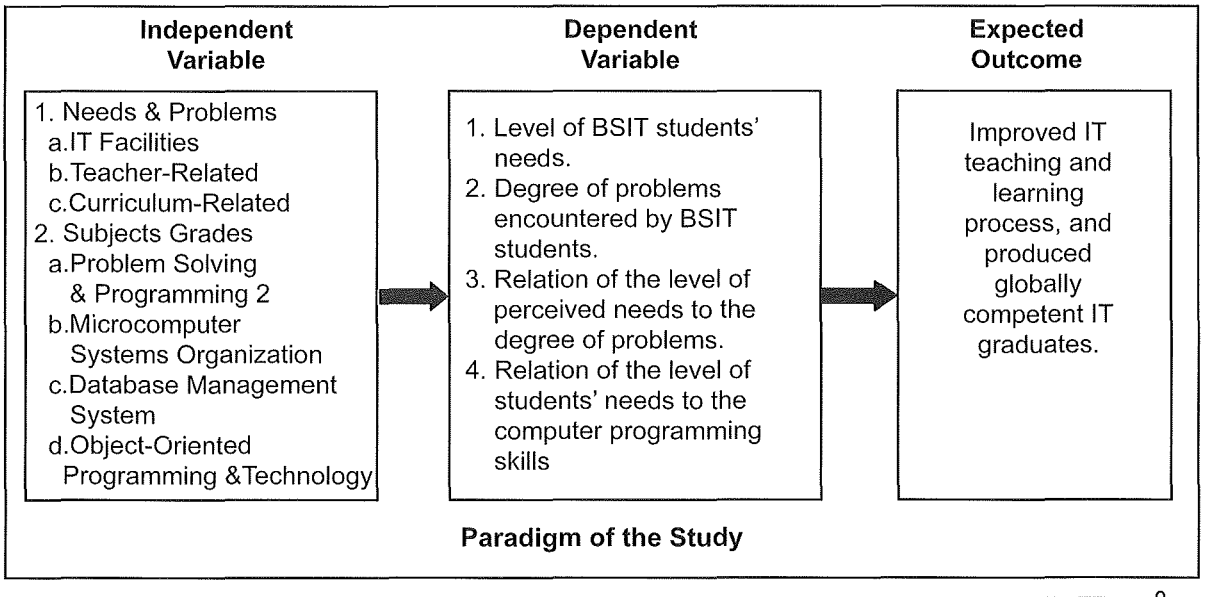
The general objective of the study was to assess the needs and problems of the BSIT students on computer programming skills. Specifically the study aimed to:

1. determine the level of BSIT students' needs on the following:
   a. IT Facilities
   b. Teacher-Related
   c. Curriculum-Related

2. determine the degree of problems encountered by BSIT students on the following:
   a. IT Facilities needs
   b. Teacher-Related needs
   c. Curriculum-Related needs

3. determine if the perceived needs are related to problems encountered by BSIT students.

4. determine the relation of the level of students' needs to the computer programming skills on the following IT major subjects:
   a. Problem Solving & Programming 2
   b. Microcomputer Systems Organization
   c. Database Management System
   d. Object-Oriented Programming & Technology



Paradigm of the Study

Expected Output

This completed research has the supreme goal of investigating and justifying the sustenance of the university to the needs and solutions of the BSIT program, based upon the analysis of data and outputs. The implications of the results will substantiate the quality of IT education the university offers. The surveyed perceptions of the students on the computer laboratory facilities, BSIT curriculum and IT teachers will serve as beacon to cultivate the culture of excellence in producing competent IT graduates that shall cater to the needs of the IT industry.

MATERIALS AND METHODS

Scope and Delimitation

BSIT students considered in the study were only those enrolled during the second semester of school year 2008 - 2009. As to the skills needed, the following were the ones considered: the problem solving & programming skills of the first years; the microcomputer systems organization skills of the second years; the database management system skills of the third year; and the object-oriented programming & technology skills of the fourth year students

Respondents of the study

All first year to fourth year student enrolled in the BSIT curriculum were the respondents of the study. There are 109 first-year students, 49 second-year students, 61 third-year students and 59 fourth-year students.

Data Gathering Procedure

A questionnaire was used as a primary tool for collecting data. The items included in the questionnaire were the degree of the needs and problems of the BSIT students. The problem solving & programming, microcomputer systems organization, database management system and object-oriented programming & technology skills were measured using the final grades the students achieved in the said subjects.

Treatment of Data

Descriptive and inferential statistics were used in the analysis and interpretation of data. The descriptive measurement in the treatment of data was the weighted mean value while the inferential measurement was the Pearson Product correlation coefficient. These were used to measure the degree of needs and degree of problems encountered by the BSIT student. The Likert Scale was used in the qualitative interpretation of the computed mean.

The Statistical Package was used to compute the Pearson Product correlation coefficient in determining the relation of the degree of needs and degree of problems encountered; and the relation between the identified needs and problems to the students' skills in computer programming. A 0.05 level of significance is set to determine the statistical significance.

RESULTS AND DISCUSSION

The definition of a need is necessity and urgent want or requires something in order to have success or achieve a goal while the definition of a problem is a question to be solved in a difficult situation or matter. A need can lead to problem or no problem at all. A problem can lead always to

Likert Scale

RANK	RANGE	DESCRIPTIVE EQUIVALENCE	SYMBOL USED
5	4.21 - 5.00	Very much/great needed/ problem	VMN/VGP
4	3.41 - 4.20	Much/great needed/ a problem	MN/GP
3	2.61 - 3.40	Moderately needed/ a problem	MoN/MoP
2	1.81 - 2.60	Partially/slight needed/problem	PN/SP
1	1.0 - 1.80	not needed/ a problem	NN/NP

need (solution). It is important that these concepts should be profoundly understood.

Table 1 presents the perceived level of needs of Information Technology students on the programming skills. For students enrolled in Problem Solving & Programming 2 the facility-related needs perceived to be very much needed are the number of computer laboratory rooms used and number of computer units used in class. The other facility-related needs are perceived to be much needed except for the location of computer laboratory room which was perceived to be moderately needed. All curriculum related needs are perceived to be moderately needed except for scheduled time of IT subject which was perceived to be much needed. Teacher-related needs were considered much needed in the problem solving & programming skills of students.

For Microcomputer Systems Organization skills, students perceived facility-related aspects are much needed and the existence of an audio-visual room was perceived to be very much needed. Curriculum-related and teacher-related aspects were also perceived to be much needed.

For students enrolled in Database Management System subject, facility-related aspects are much needed with existence of an audio-visual room; number of computer units used; number of computer laboratory rooms used; and availability of IT reference books at the library perceived to be very much needed. The curriculum-related aspect perceived to be much needed was the number of subjects offered per semester and others were perceived to be moderately needed. For Teacher-related factor, mastery of subject matter was perceived to be very much needed, others were much needed except for personal quality and punctuality which were moderately needed.

Students enrolled in Object-Oriented Programming & Technology subject perceived the following facility-related factor as very much needed: number of computer laboratory room used; number of computer units used; existence of an audio-visual room; and availability of IT reference book in the library. The other facility-related aspects are considered much needed except for the following: location of laboratory room; number of subjects offered per semester; and number of hours allotted per subject, which are considered to be moderately needed. The curriculum-related aspects are considered to be very much needed and specifically the following: scheduled time of IT subject per semester; sequencing of subjects offered; and subjects included in the curriculum. Other curriculum-related aspects are perceived to be moderately needed. Under teacher-related aspect, mastery of subject matter was very much needed and all the rest were considered much needed.

In general, for facility-related aspects, number of computer laboratory rooms used; and number of computer units used were perceived to be very much needed and other facility-related aspects are much needed except for location of laboratory rooms and space of lecture room which were considered to be moderately needed. Curriculum-related aspects were considered to be moderately needed while teacher-related aspects were all considered much needed.

Table 2 presents the extent of problems encountered by students enrolled in programming subjects. Under facility-related aspects, students who took up Problem Solving & Programming 2 considered number of computer laboratory rooms used a very great problem. The other facility-related aspects were considered to be a moderate problem except for location of computer laboratory room which was to the students, a partial problem only. Curriculum-related aspects was considered a partial problem but scheduled time of IT subject and number of hours allotted per subject were considered moderate problems. Teacher-related aspect was considered a partial problem except for personal qualities which students considered a moderate problem.

Students who took up Microcomputer Systems Organization considered the facility-related aspect to be a moderate problem with number of computer units used to be a very great problem. The number of laboratory rooms used;

Table 1. Extent of BSIT students' facility-related, curriculum-related and teacher-related needs

NEEDS	COMPUTER PROGRAMMING SKILLS									
	Problem Solving & Programming 2		Microcomputer Systems Organization		Database Management System		Object-Oriented Programming & Technology		Overall	
A. FACILITY-RELATED	Mean	Des.	Mean	Des.	Mean	Des.	Mean	Des.	Mean	Des.
1. Number of Computer Laboratory Room used	4.32	VMN	4.19	MN	4.30	VMN	4.30	VMN	4.28	VMN
2. Space of Computer Laboratory Room used	3.73	MN	3.14	MoN	3.85	MN	3.53	MN	3.56	MN
3. Location of Computer Laboratory Room	3.03	MoN	2.74	MoN	3.32	MoN	3.33	MoN	3.11	MoN
4. Number of Computer Lecture Room used	3.53	MN	3.63	MN	3.88	MN	3.72	MN	3.69	MN
5. Space of Computer Lecture Room used	3.56	MN	3.05	MoN	3.45	MN	3.42	MN	3.37	MoN
6. Location of Computer Lecture Room used	3.86	MN	3.74	MN	2.95	MoN	3.91	MN	3.62	MN
7.Availability of Reference IT Books in Library	3.99	MN	4.07	MN	4.48	VMN	4.51	VMN	4.26	VMN
8. Existence of an Audio-Visual Room	3.95	MN	4.37	VMN	4.30	VMN	4.47	VMN	4.27	VMN
9. Number of Computer units used in class	4.51	VMN	4.88	VMN	4.72	VMN	4.91	VMN	4.76	VMN
Overall Wtd. Mean	3.83	MN	3.76	MN	3.92	MN	4.01	MN	3.88	MN
B.CURRICULUM-RELATED										
1. Scheduled time of IT subjects offered	3.37	MN	3.09	MoN	3.32	MoN	3.42	MN	3.30	MoN
2. Number of subjects offered per semester	3.05	MoN	3.14	MoN	3.48	MN	3.19	MoN	3.21	MoN
3. Number of hours allotted per subject	3.17	MoN	3.21	MN	3.22	MoN	3.35	MoN	3.24	MoN
4. Sequencing of subject offered (for 4th years only)							3.74	MN		
5. Subjects included in the curriculum(for 4th years)							3.95	MN		
Overall Wtd. Mean	3.20	MoN	3.15	MoN	3.34	MoN	3.53	MN	3.30	MoN
C.TEACHER-RELATED										
1. Mastery of subject matter	3.70	MN	3.98	MN	4.32	VMN	4.23	VMN	4.06	MN
2. Preparation of subject matter	3.70	MN	3.88	MN	4.05	MN	4.07	MN	3.93	MN
3. Organization of subject matter	3.42	MN	3.81	MN	3.92	MN	3.91	MN	3.77	MN
4. Presentation of subject matter	3.79	MNs	4.00	MN	4.15	MN	3.86	MN	3.95	MN

Continued... Table 1.

5. Communication and teaching skills	3.58	MN	3.79	MN	4.08	MN	3.63	MN	3.77	MN
6. Classroom management	3.70	MN	3.98	MN	3.82	MN	4.02	MN	3.88	MN
7. Personal Qualities	3.67	MN	3.51	MN	3.25	MoN	3.44	MN	3.47	MN
8. Punctuality	3.51	MN	3.28	MoN	3.35	MoN	3.53	MN	3.42	MN
9. Attendance	3.55	MN	3.35	MoN	3.50	MN	3.42	MN	3.45	MN
Overall Wtd. Mean	3.62	MN	3.73	MN	3.82	MN	3.41	MN	3.65	MN

availability of reference IT books in the library, and existence of audio-visual room were considered great problems. Curriculum-related aspects were considered a slight problem. Teacher-related aspects are also considered a slight problem but the following teacher-related aspects were moderate problems: mastery, preparation, organization and presentation of subject matter; and classroom management were moderate problems.

For students enrolled in Database Management System, facility-related aspect was considered great problem. Specifically the following were considered very great problems: existence of audio-visual room; number of computer units used; and number of laboratory rooms used. The space of laboratory rooms; number of lecture rooms; and availability of of reference IT book in the library were considered great problems. Other facility-related aspects were considered to be moderate problems. All curriculum-related aspects were perceived to be moderate problems. Teacher-related aspect was considered a moderate problem but mastery of subject matter; and communication and teaching skills were great problems.

For facility-related aspects, the number of computer units used was considered a very great problem by students enrolled in Object-Oriented Programming & Technology. The following facility-related aspects were also great problems: number of computer laboratory room used; location of computer lecture rooms; availability of reference IT books in the library; and existence of audio-visual room. Other facility-related aspects were considered moderate problems except for location of laboratory room which was perceived as slight problem. Curriculum-related aspects were perceived to be moderate problem but subjects included in the curriculum as great problem. For teacher-related problem, mastery of subject matter was perceived to be a great problem the others considered moderate problem except for attendance which was considered a slight problem.

Generally facility-related aspect was perceived to be a great problem with number of computer units used as a very great problem. All the other facility-related aspects were considered moderate problems except for location of laboratory room which was considered to be just a slight problem. All curriculum-related aspects were considered moderate problem. Teacher-related aspects were also considered a moderate problem except for punctuality and attendance perceived to be just a slight problem.

The relationship between student's need and student's problem is presented on Table 3. The table shows that facility-related needs are significantly related to facility-related problems. This is based on the computed r value of 0.6830 which is significant at 0.05 level of significance. This is also observed with the curriculum-related and teacher-related aspects. The result implies that the greater the perceived needs, the greater the problem it provides.

Table 4 presents the relationship between student's programming skills with perceived needs. It could be seen from the table that among all the needs indicated only facility-related needs has a significant relationship to Microcomputer Systems Organization skills of students. This is

Table 2. Extent of BSIT students' facility-related, curriculum-related and teacher-related problems

NEEDS	COMPUTER PROGRAMMING SKILLS									
	Problem Solving & Programming 2		Microcomputer Systems Organization		Database Management System		Object-Oriented Programming & Technology		Overall	
A. FACILITY-RELATED	Mean	Des.	Mean	Des.	Mean	Des.	Mean	Des.	Mean	Des.
1. Number of Computer Laboratory Room used	3.82	GP	3.72	GP	4.25	VGP	3.84	GP	3.91	GP
2.Space of Computer Laboratory Room used	3.09	MoP	2.70	MoP	3.6	GP	3.09	MoP	3.12	MoP
3.Location of Computer Laboratory Room	2.41	SP	2.19	SP	3.15	MoP	2.60	SP	2.59	SP
4. Number of Computer Lecture Room used	3.02	MoP	3.19	MoP	3.6	GP	3.07	MoP	3.22	MoP
5.Space of Computer Lecture Room used	3.16	MoP	2.70	MoP	3.30	MoP	3.02	MoP	3.05	MoP
6.Location of Computer Lecture Room used	3.39	MoP	3.40	MoP	2.92	MoP	3.42	GP	3.28	MoP
7.Availability of Reference IT Books in Library	3.37	MoP	3.79	GP	4.18	GP	4.00	GP	3.83	GP
8.Existence of an Audio-Visual Room	3.43	GP	4.09	GP	4.22	VGP	3.86	GP	3.90	GP
9.Number of Computer units used in class	3.93	MoP	4.65	VGP	4.82	VGP	4.67	VGP	4.52	VGP
Overall Wtd. Mean	3.29	MoP	3.38	MoP	3.78	GP	3.51	GP	3.49	GP
B.CURRICULUM-RELATED										
1.Scheduled time of IT subjects offered	2.63	MoP	2.14	SP	3.02	MoP	3.00	MoP	2.70	MoP
2.Number of subjects offered per semester	2.43	SP	2.37	SP	3.25	MoP	2.60	SP	2.66	MoP
3.Number of hours allotted per subject	2.71	MoP	2.49	SP	3.10	MoP	2.79	MoP	2.77	MoP
4.Sequencing of subject offered (for 4th years only)							3.37	MoP		
5.Subjects included in the curriculum(for 4th years)							3.47	GP		
Overall Wtd. Mean	2.59	SP	2.33	SP	3.12	MoP	3.05	MoP	3.37	MoP
C.TEACHER-RELATED										
1.Mastery of subject matter	2.32	SP	2.81	MoP	3.65	GP	3.51	GP	3.07	MoP
2.Preparation of subject matter	2.42	SP	2.63	MoP	3.30	MoP	3.35	MoP	2.92	MoP
3.Organization of subject matter	2.45	SP	2.63	MoP	3.22	MoP	3.12	MoP	2.85	MoP
4.Presentation of subject matter	2.53	SP	2.79	MoP	3.20	MoP	3.30	MoP	2.96	MoP

Continued... Table 2.

5.Communication and teaching skills	2.49	SP	2.42	SP	3.48	GP	2.86	MoP	2.81	MoP
6.Classroom management	2.38	SP	2.84	MoP	3.20	MoP	3.28	MoP	2.92	MoP
7.Personal Qualities	2.67	MoP	2.53	SP	2.85	MoP	2.84	MoP	2.72	MoP
8.Punctuality	2.50	SP	2.19	SP	2.82	MoP	2.77	MoP	2.57	SP
9.Attendance	2.40	SP	2.16	SP	2.98	MoP	2.44	PP	2.49	SP
Overall Wtd. Mean	2.46	SP	2.56	SP	3.19	MoP	3.05	MoP	2.81	MoP

Table 3. Relationship between student's needs and students' problems

PROBLEMS	NEEDS					
	Facility-Related		Curriculum-Related		Teacher-Related	
	r	sig.	r	sig	r	sig
Facility-Related	0.6830	0.00	0.3920	0.00	0.2840	0.000
Curriculum-Related	0.3310	0.00	0.5770	0.00	0.2030	0.002
Teacher-Related	0.2870	0.00	0.3720	0.00	0.3230	0.000

Table 4. Relationship between student's performance and needs

NEEDS	PERFORMANCE							
	Problem Solving & Programming 2		Microcomputer Systems Organization		Database Management System		Object-Oriented Programming & Technology	
	r	sig.	r	sig	r	sig	r	sig
Facility-Related	-0.143	0.155	0.330	0.034	-0.262	0.089	0.039	0.785
Curriculum-Related	0.034	0.74	0.172	0.288	-0.107	0.495	-0.361	0.009
Teacher-Related	0.005	0.959	0.026	0.872	0.087	0.58	-0.151	0.284

Table 5. Student computer ratio

COMPUTER LABORATORY INVENTORY Second Semester SY 2008 – 2009					
Computer Laboratory Room	Total Computer Units	Subject	Course-Section	Total Students	Student Computer Ratio
CAS Ann 211	15	Object-Oriented Programming and Technology	BSIT IV - P1	33	3:1
			BSIT IV - P2	26	2:1
CAS Ann 212B	10	Database Management System	BSIT III – P1	34	3:1
			BSI III – P2	27	3:1
CAS Ann 208	12	Problem Solving and Programming 2	BSIT I – P1	57	5:1
			BSIT I – P2	52	5:1
CAS Ann 212A	15	Microcomputer Systems Organization	BSIT II – P1	27	2:1
			BSIT II – P2	21	2:1

indicated by the r value of 0.034 which is significant at 0.05 level of significance. Curriculum-related needs have also significant relationship to Object-Oriented Programming & Technology skills base on the r value of 0.361 significant at 0.05 level of significance. The other skills have no significant relationship with the listed facility, curriculum and teacher- related needs.

This implies that Microcomputer Systems Organization skills of students are better if better facility-related aspects are provided. Likewise, a better Object-Oriented Programming & Technology skill is expected for a better curriculum-related improvement. Problem Solving & Programming and Database Management System skills maybe affected by other needs not included in the study.

The deficiencies of the university to meet the ideal 1 to 1 student computer ratio has deprived and downgraded the experience and level of attaining 100% hands-on IT trainings for students. Not only BSIT students who are affected but also other courses such as BSA, BEE, BSAE, BSAB, BSAS, BSES, and BSCHE who enroll IT-11 Basic Computer Education subject in CAS. The CHED's requirements of physical facility like computer laboratory are "The laboratory floor space should be at least 2.0 square meters per student. For the computer laboratory, there should be no more than two (2) students per terminal or workstation. The number of terminals or workstations should be such that a student is provided at least three (3) hours of individual hands-on computer time per week. On the basis that each computer terminal or work station operates effectively at least ten (10) hours a day and six (6) days a week, the computer time requirement should translate to at least one computer per twenty (20) students enrolled in the Information Technology Education (ITE) program, the computers being exclusively for their use. At least one of the laboratories should be a multi-user or a networked system. Likewise, one printer is required per fifteen (15) computers. Computers should also be provided for the use of the faculty. The required computer hardware and software should be able to respond to the objectives of the subjects in the curriculum. They should conform to generally accepted industry standards and be capable of providing training in the micro, mid-range or main-frame environments. At least twenty percent (20%) of the equipment should have been manufactured within the last three (3) years." (CHED MEMORANDUM ORDER (CMO) NO. 25 Series of 2001 Section 24.8.1 & 24.8.2)

The CAS Annex has scarcity of lecture rooms to accommodate the plenty of subjects (Math, Science, Statistics, Social Sciences and IT). Unfortunately, the shortage causes the usage of computer laboratory room as lecture room which the ideal should be only used for laboratory. The CHED's requirements of physical facility like lecture and laboratory are "Classrooms space should at least be 1.2 square meters per student. For a class size of 40 students, for example, the room should be at least 48 square meters; for 50 students, 60 square meters. It should be well

Table 6. CAS annex's computer laboratory room used as both lecture and laboratory

CAS ANNEX LECTURE ROOM Second Semester SY 2008 – 2009				
15 Total Lecture Rooms				
Subject	Computer Laboratory Room	Lecture Room	Course-Section	Total Students
Object-Oriented Programming and Technology	CAS Ann 211	CAS Ann 211	BSIT IV – P1 BSIT IV – P2	33 26
Database Management System	CAS Ann 212B	CAS Ann 212B	BSIT III – P1 BSI III – P2	34 27
Problem Solving and Programming 2	CAS Ann 208	CAS Ann 208	BSIT I – P1 BSIT I – P2	57 52
Microcomputer Systems Organization	CAS Ann 212A	CAS Ann 212A	BSIT II – P1 BSIT II – P2	27 21

Table 7. Total IT book titles

BSU UNIVERSITY LIBRARY AND INFORMATION SERVICES IT Books Inventory as of July 2009		
Subject	Topics	Total Books
Object-Oriented Programming and Technology	Object-Oriented Concepts	2
	C++	10
	Java	1
	.NET Languages	4
Database Management System	SQL	6
	Database Management System	7
	PHP	2
	ASP .NET	1
Problem Solving and Programming 2	C/C++	5
	Java	5
Microcomputer Systems Organization	Structured Computer Organization and Architecture	4
	Assembly Language Programming	3
	Microcomputer and Microprocessors	3

lighted and well ventilated and/or air-conditioned. There should be at least one classroom per one hundred thirty-five (135) students enrolled. The school must provide for computer laboratories required for hands on training of the students." (CHED MEMORANDUM ORDER (CMO) NO. 25 Series of 2001 Section 24.7 & 24.8)

Table 7 shows the topics per subject and its total different book titles. The topic C++ has 10 different book titles and it meets the requirements of 10 different book titles/authors of CHED however it is 1 quantity each and should be 5 quantities per book title to 10 students ratio. The ideal requirements for IT books should be 5 different book titles/authors per subject for every ten (10) students enrolled (CHED MEMORANDUM ORDER (CMO) NO. 25 Series of 2001 Section 22.1).

Although the BSU Library has Multimedia Room, PIUC has ICT Hall and the CAS has Little Theater how we wish that the IT should have an exclusive audio-visual or multimedia room to conduct E-Learning, IT Hands-On Trainings/ Seminars, Multimedia Applications(Audio-Video-Animation Productions), Network Administration and Communication. As a general rule, the Higher Education Institution(HEI) should provide the necessary audio-visual equipment in support of the teaching-learning process, such as overhead projectors, slide projectors, LCD projectors, multimedia etc. (CHED MEMORANDUM ORDER (CMO) NO. 25 Series of 2001 Section 25).

At present more IT Teachers need to attend Teaching Effectiveness and Methodology Course to enhance their teaching skills in the classroom and laboratory. A few IT Teachers are not proficient and competent in teaching computer programming languages because they lack practice and experience and also some are not in this field of profession they graduated. This is justified by their low rating in the semestral Faculty Evaluation Performance by students. Thus, IT Teachers should attend more IT Hands-on trainings or workshops. The most effective way of attaining mastery in any subject to teach is 'Practice what you preach principle' because you gain experience from applying and validation of concepts learned from outputs. This can be done through engaging in IT research and development, software development projects and IT hobby/ interest/innovation.

CONCLUSIONS AND RECOMMENDATION

Conclusions

Based on the results gathered, the following are concluded:

1. There are facility-related, curriculum-related and teacher-related needs perceived by IT students to be of much need.

2. There are facility-related, curriculum-related and teacher-related needs perceived by IT students to be of great problem.

3. Perceived needs have a significant relationship to perceived problems encountered by IT students.

4. There is no significant relationship between facility-related, curriculum-related and teacher-related to Problem Solving and Programming and Database Management System skills.

5. There is a significant relationship between facility-related aspects to Microcomputer Systems Organization skill of IT students.

6. There is a significant relationship between curriculum-related needs to Object-Oriented Programming & Technology skills of IT students.

Recommendations

Based on the conclusions, the following are recommended:

1. A need for more number of computer units and laboratory rooms used should be acquired.

2. The administration should provide more reference IT books to the library for all students to avail of.

3. An audio-visual room for IT should be provided to enhance teaching-learning process.

4. Teachers should have additional trainings/workshops to improve mastery, organization and presentation of subject matter.

5. Conduct other researches on factors that enhance programming skills.

6. Conduct other researches on other aspects of students may consider as a problem or need in the learning process.

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