# The Familiarity and Degree of Integration of E-Learning Tools Into the Teaching Instruction of Non-Information Technology Faculty at a Philippine University

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This paper investigates the level of familiarity and degree of integration of information and communication technology (ICT) tools into the teaching instruction of non-ICT faculty at a Philippine university. All non-ICT fulltime faculty members in the undergraduate, graduate and post graduate programs teaching in the 1st Semester of School Year 2009-2010 were included in this study. A self-constructed survey questionnaire was used for data gathering. The results show that the respondents have high level of familiarity with ICT tools but ICT integration by respondents from Social Sciences and Humanities, and Natural Sciences, Mathematics and Engineering, are rare. The Health Sciences group has the highest aggregate mean degree of integration. The significance value comparing the groups of respondents by discipline is .023. The non-ICT faculty at this Philippine university is technologically challenged with the use of the ICT tools into their teaching instruction. Their level of familiarity requires help from experts for them to work and use ICT tools. Likewise, their degree of integration of ICT tools is alarming given the fact that they rarely use and integrate the tools into their teaching. The primary reason for technology diffusion among the non-ICT faculty in this university is the lack of hardware and software resources installed in these academic units.

**KEYWORDS:** Information and Communication Technology, ICT in Education, eLearning

## BACKGROUND OF THE STUDY

Information and communication technology (ICT) refers to information-handling tools that are used to generate, store, process, distribute and share information (UNDP, 2001). The Philippines' Commission on Information and Communications Technology defines ICT as the totality of electronic means for end-users such as computer systems, office systems and consumer electronics, as well as networked information infrastructure, the components of which include the telephone system, the Internet, fax machines, and computers. ICT is considered by UNDP as enabler of development in education. Rodrigo (2001) asserts that the use of ICT in education provides positive pedagogical, social and economic benefits. Arguably, teens are born into a digital world where they expect to be able to create, consume, remix, and shape material with one another through computer and video games (Lenhart, Kahne, Middaugh, Macgill, Evans & Vitak, 2008). This may explain why students are now labeled as digital learners.

For schools in developed countries, ICT in education has undeniably produced significant positive impacts. Maryska, Doucek, and Kunstova (2012) conclude that all of developed countries are depending on ICT because of the increasing investment into ICT and increasing required number of ICT specialists. "ICT is changing the developed world's attitudes and approaches to education" (Loxley, 2004). Education in these countries becomes more flexible and accommodating, increasing its reach to potential learners. E-learning, blended learning, open and distance learning, learner-centered environment, mobile learning, intelligent tutoring systems, games, simulations, and microworlds are just the few dramatic changes in education of these countries. Practices of ICT integration in education in developing countries are different. Peeraer and Petegem (2012) conclude that integration of ICT in education in developing countries is a "slow process and observations bring to light a number of steps to be taken in the process." It is often included in national reforms agenda for the betterment of teaching-learning process.

Silliman University is one of the many educational institutions in Asia that aims to promote the use of modern ICT to expand its commitment to attain human development for the well-being of society and environment. It launched the Silliman Online University Learning (SOUL) system in 2008. Ultimately, the system aims to acquire and deliver learning and trade products remotely, mainly through

cyberspace while maintaining and upholding Silliman University's mission and vision (Marcial, 2010). It is remarkable contribution to the teaching and learning experience of ICT faculty members and students. Unfortunately, records show that few non-ICT teachers utilized the system—a challenge for the College of Computer Studies and the SOUL team.

This paper studies the level of familiarity and degree of integration of ICT into the teaching instruction of non-ICT faculty (grouped according to discipline) in Silliman University. The reasons that hindered the respondents/faculty in integrating ICT into their teaching were identified. ICT tools evaluated during the study were limited to basic tools such as the use of office productivity tools, Internet, and social networking.

## REVIEW OF RELATED LITERATURE

The Asian Development Bank (ADB) reported that innovative ICT has potential in reducing poverty in Asia and the Pacific (ADB, a). ADB's ICT initiatives in education highlight projects for improving skills training in poor rural areas. Specifically, it includes ICT components like assessment, training, and e-learning systems development, among others (ADB, b). Similarly, the World Bank promotes access and use of ICT to stimulate sustainable economic growth, improve service delivery, and promote good governance and social accountability. Word Bank's program on ICT focuses on three pillars: infrastructure, skills development, and the use of ICT applications in specific sectors and contexts like education (World Bank). Moreover, UNESCO believes that ICT can address the challenges faced in teacher education (UNESCO, 2011). UNESCO has initiatives related to the use of ICT in teacher education by supporting existing teacher development communities of practice, multi-stakeholder partnerships, capacity building of policy-makers and the development of international standards on ICT competencies for teachers.

E-mail, listservs/discussion boards, video-conferencing, white-boards, smartphones, and mobile technologies are some of the many ICT tools that are widely used today. Fink (2006) enumerated the five uses of computers in education: Enhanced Audio-Visual Presentations, New Forms of Communication, Access to New Forms of Information, Pre-Packaged Learning Programs, and Course Management Programs. Each use has associated tools (Table 1).

Moreover, these tools are all designed not only for ICT teachers, but generally for all teachers. Nowadays, there have been researchers across disciplines focusing their study on the effective use of ICT in the teaching and learning, e.g. Espinosa and Caro (2011) about ICT integration in basic education; Vinluan (2011) on school guidance; Kamei (2010) about out-of-school youth; Bernal, Tolentino, Gavino, and Fontelo (2008) on nursing; Ramos, Nangit, Ranga, and Triñona (2007) on distance education; and Carbonell, Tabamo, Guevara, and Javier (2003) on engineering mathematics. All of these studies pointed to the use of ICT in the teaching and learning process. Other fields like Liberal Arts, Broadcasting and Journalism, and Humanities hope also to improve teaching and learning experiences through ICT tools. Goliath Business Knowledge, an online journal on the integration of technology into learning and teaching in the liberal arts, states: "Well-educated citizens need to understand technology and how to communicate within new media effectively in the same way that they need to be able to write."

*Table 1.*

*Uses of ICT and Associated Tools.*

| Uses | Associated Tools |
| --- | --- |
| 1. Enhanced Audio-Visual Presentation | Using computers to supply Audio-Video material simply requires one of several presentation software programs, e.g., Microsoft's Power Point, Adobe's Persuasion, Harvard Graphics, RealPlayer. The material created with these programs is most commonly shown in a classroom by using a portable laptop computer that has been connected to a classroom video projector. However, presentation software can also be stored on a series of web pages and accessed by students through the Internet with their computers. |

*Table 1. (Continued...)*

*Uses of ICT and Associated Tools.*

| Uses | Associated Tools |
| --- | --- |
| 2. New Forms of Communication | Course-specific web pages and electronic communication, e.g., email, listservs, chat rooms, bulletin boards, wikis, blogs, newsgroups, etc. |
| 3. Access to New Forms of Information | They key technologies here are websites, web browsers, and the Internet. Information (all forms: words, pictures, numbers and sound) can be stored on a webpage at a website, and accessed with a web browser, e.g., Mozilla Firefox, or Microsoft Internet Explorer, through the Internet. |
| 4. Pre-Packaged Learning Programs | Such programs are usually made available to learners in two forms: on a CD-ROM or on a website. Both offer the opportunity for storing extensive amounts of information and the opportunity for learners to interact with that material. |
| 5. Course Management Programs | Basically this function depends on nothing more than having a course management software program that has been designed for this purpose. Some of the popular examples at the present time are Moodle, ModX, Accutrack, GradeQuick, and MicroGrade and among others. |

Adopted from *Five Fundamental Uses of Computers in Teaching and Learning* by Fink (2006)

Researches show several significant positive impacts on the teaching-learning process in many universities. However, technology alone does not guarantee improvement in the teaching-learning. An article published by Glencoe Online on "Teaching Integration Strategies," states that technology has a positive impact on student's learning only when effectively applied and utilized. Strategies include:

increase student motivation for learning, improve communication of learning goals, facilitate higher-order thinking skills, build valuable skills that students will use in college and in the workplace, and expand students' understanding from novice to mastery. Further, Chickering and Ehrmann argue that "if the power of the new technologies is to be fully realized, they should be employed in ways consistent with the Seven Principles for Good Practice in Undergraduate Education." These practices that can be augmented with use of ICT are: [1] Good Practice Encourages Contacts Between Students and Faculty, [2] Good Practice Develops Reciprocity and Cooperation Among Students, [3] Good Practice Uses Active Learning Techniques, [4] Good Practice Gives Prompt Feedback, [5] Good Practice Emphasizes Time on Task, [6] Good Practice Communicates High Expectations, and [7] Good Practice Respects Diverse Talents and Ways of Learning. Other benefits of ICT integration in education include provision of a qualitative access to education (Boyanova & Filipova, 2008); cost reduction, self-paced training, knowledge consistence, time and place independence and access to global audience (Anido, et al., 2004); and valid sustainable strategy (Hickey & Whitehouse, 2010). Carvalho de Sousa, Sevilla-Pavón, and Seiz-Ortiz (2012) also concluded that ICT brings about a change in attitudes, values and behaviours, for both mental and perceptive processes, demanding new methodologies and pedagogical approaches in accordance with the needs of new generations. Likewise, Akhondi (2011) asserts that there is a meaningful relation among virtual teaching and learning-teaching process.

While it is true that ICT can support changes in pedagogy and improvements in teaching-learning, providing computers in the classroom does not improve outcomes. Larry Cuban, a well-known researcher on school reform and classroom practices using ICT, said that technology's role in today's classroom is not to motivate, instead, it gives students opportunities to efficiently and effectively participate in motivating activities built around individuals and ideas that matter to them. ICT integration in school should be well-planned. An education policy for ICT in education should be the primary policy in any institution (World Bank, 2003). Absence of these complementary reforms may result in slow infusion of ICT in education. Affordability, lack of infrastructure, inadequate funding and scarcity of qualified human resources are among the many reasons for the diffusion of ICT in education (Loxley, 2004). Moreover, common barriers in adopting ICT in the teaching of non-ICT faculty include dissatisfaction among

the faculty (Al-Senaidi, Lin & Poirot, 2009) and insufficient knowledge, lack of time and lack of technical competency (Hus, 2011). Grazzi and Vergara (2012) also say that traditional socioeconomic variables such as income, education and urban/rural areas are relevant determinants of computer adoption.

A study conducted by del Rosario (2007) on "Technology Integration in Teacher Education Programs in the Philippines," revealed the complexity of integrating technology because a host of variables, that are by themselves complex, impact technology integration. Accordingly, these variables include national, state and school policies, state and local technology plans or lack thereof, funding or lack thereof, teacher skills or lack thereof, the rapidly changing nature of technology, learning goals and objectives, teacher training and professional development, and technology support or lack thereof vis a vis the number of students in a school. The results of del Rosario's study also point to emerging themes found to be attendant in technology integration, to wit: within the context of developing countries, the influence of modernization and the desire of these countries to become modernized and developed by using ITs as strategic tools; whether IT is introduced as an added course or infused in the curriculum; and the evolving nature of technology, in particular the emerging trend of mobile technology and how this impacts technology use.

The use of ICT tools is a shared responsibility among teachers and learners. Ismail, Norbaya, and Azman (2011) conclude in their study that teachers' perceptions on their own literacy in ICT play an important role in determining the success of ICT integration in schools. ICT tools like online learning can lead to a disaggregating of the traditional role of teachers. It alters the role not only of the institution but, potentially of the teacher, as well (Maeroff, 2003). Further, García-Valcárcel, and Tejedor (2009) recommend three primary actions for a successful ICT integration in higher education: infrastructure development, teacher training and that of students, and institutional support.

## METHODOLOGY

This study covered all non-ICT fulltime faculty members in the undergraduate, graduate and post graduate programs in the university. Only those fulltime faculty members teaching in the First

Semester of SY 2009-2010 were included in the study. However, faculty from the College of Computer Studies and allied courses of IT Education offered in the university such as BS in Computer Engineering, BS Physics and Bachelor of Science in Business Computer Application were excluded in the conduct of this study mainly because these courses are computer-related and emphasize the use of digital technologies in their curriculum. Likewise, the School of Basic Education and Medical School are not included in the study primarily because of the nature of their teaching and the main focus of this study is all faculty members in the tertiary level.

Moreover, this is a descriptive-correlative research and utilized a survey method. The respondents of the study are all fulltime faculty members of colleges mentioned earlier. Using the formula

$$n = \frac{N}{1 + Ne^2}$$

the sample size of the respondents was determined, where $n$ is the sample size, $N$ *(260)* is the total population and $e$ (5%) is the margin of error. Using the stratified sampling procedure (% = $\frac{n}{N}$), a total of 158 non-ICT faculty members in SU were included in the conduct of the survey. Respondents from each department were identified using a fish-bowl technique. A retrieval rate of 87% (137) was achieved in the study (see Table 2). Therefore, the interpretation of data is limited to the returned survey questionnaires during the period June 2009 to 30 May 2010.

*Table 2.*

*Distribution of Respondents by Discipline, n = 137.*

| Discipline | Number of Respondents |
|---|---|
| *Health Sciences* | |
| Nursing | 39 |
| Clinical Laboratory Sciences | 4 |
| Rehabilitative Sciences | 2 |
| | |
| *Social Sciences and Humanities* | |
| Business Administration | 10 |
| Education | 10 |
| English & Literature | 9 |
| Anthropology/Sociology | 4 |
| Divinity School | 4 |
| Law | 4 |
| Performing Arts | 4 |
| Filipino and Foreign Languages | 3 |
| Religious Studies | 3 |
| Agriculture | 3 |
| History and Political Science | 2 |
| Philosophy | 2 |
| Psychology | 2 |
| Mass Communication | 2 |
| Public Affairs and Governance | 1 |
| Social Work | 1 |
| | |
| *Natural Sciences, Mathematics, and Engineering* | |
| Biology | 9 |
| Chemistry | 8 |
| Mechanical Engineering | 4 |
| Mathematics | 3 |
| Foundation Engineering | 3 |
| Civil Engineering | 1 |
| | |
| Total | 137 |

The instrument used in data gathering to accomplish the specific objectives of the study was the survey questionnaire. It was composed of two interrelated parts. Part I was designed to gather the personal data of the respondents for the purpose of classifying them according to their college, gender, status, age bracket and other pertinent data.

Part II is subdivided into three sections. The first section was designed to determine the level of familiarity of the respondents in integrating ICT tools while the second section was designed to determine the level of integration of the respondents on the available ICT tools into teaching. ICT tools included in the survey are only limited to the basic tools such as the use of office productivity tools, Internet, and social networking. It is also based on the associated tools introduced by Fink (2006). Lastly, the third section was designed to identify the problems encountered by the respondents that kept them from integrating digital learning technologies into their teaching.

## RESULTS AND DISCUSSION

### Profile of Respondents

Majority of the respondents are married (72.99%), female (62.04%), have a master's degree (56%), are ranked assistant professor (53%) (Table 3).

Table 3.

Demographic Profile of Respondents, n=137.

| Profile | ƒ | % |
|---|---|---|
| *Status* | | |
| Married | 100 | 72.99 |
| Single | 33 | 24.09 |
| Widow | 1 | 0.73 |
| No Response | 3 | 2.19 |
| **Total** | **137** | **100.00** |
| | | |
| *Gender* | | |
| Female | 85 | 62.04 |
| Male | 47 | 34.31 |
| No Response | 5 | 3.65 |
| **Total** | **137** | **100.00** |
| | | |
| *Highest Educational Attainment* | | |
| Master's Degree / LLB | 77 | 56.20 |
| Bachelor's Degree | 26 | 18.98 |
| Ph.D. / Doctor's Degree | 17 | 12.41 |

*Table 3. (Continued...)*

*Demographic Profile of Respondents, n=137.*

| Profile | *f* | % |
|---|---|---|
| No Response | 17 | 12.41 |
| **Total** | **137** | **100.00** |
| | | |
| *Academic Rank* | | |
| Assistant Professor | 72 | 52.55 |
| Instructor | 53 | 38.69 |
| Associate Professor | 8 | 5.84 |
| Full Professor | 3 | 2.19 |
| No Response | 1 | 0.73 |
| **Total** | **137** | **100.00** |

## ICT Literacy of the Respondents

Almost 90% of the respondents (Table 4) have an email account and 42% of this figure said that they open their email account at least once a day, 36% once a week, 9% at least once a month, and 2% at least once a semester. Ninety-three percent have a personal computer at home but only 75% have Internet connection at home. Meanwhile, almost 71% have social networking accounts and others own a Facebook account (32.85%).

The result of the ICT literacy provides a positive indication that the non-ICT teachers in Silliman University possess the very basic Internet skills. Ownership of an email account as well as subscription to social networking sites (SNS) may imply that they have access to the new form of communication and information. It is also noted in the result that email ownership is not statistically associated with the status, gender, educational attainment and academic rank of the respondents. However, age is statistically significant at 0.05 level with email ownership. This clearly means that email ownership is influenced by age of the respondents. However, the study also reveals that age doesn't influence the frequency in opening the email account.

Status and academic rank are statistically significant at 0.05 level with the subscription to SNS (e.g., Facebook). The data reveals that faculty members who are single are inclined to have an SNS account more than those who are married. The result also reveals that age is statistically significant at 0.01 level with SNS subscription. This means

*Table 4.*

ICT Literacy of the Respondents by Discipline.

| Item of Integration | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % |
| *Email Account* | | | | | | | | |
| With Email | 57 | 89.06 | 25 | 89.29 | 40 | 88.89 | 122 | 89.05 |
| Without Email | 5 | 7.81 | 1 | 3.57 | 5 | 11.11 | 11 | 8.03 |
| No Response | 2 | 3.13 | 2 | 7.14 | 0 | 0 | 4 | 2.92 |
| **Total** | **64** | **100.00** | **28** | **100.00** | **45** | **100.00** | **137** | **100.00** |
| *Number of times that the respondents open their account* | | | | | | | | |
| At least once a day | 30 | 46.88 | 11 | 39.29 | 17 | 37.78 | 58 | 42.34 |
| At least once a week | 20 | 31.25 | 11 | 39.29 | 18 | 40.00 | 49 | 35.77 |
| At least once month | 5 | 7.81 | 3 | 10.71 | 4 | 8.89 | 12 | 8.76 |
| At least once a semester | 1 | 1.56 | 1 | 3.57 | 1 | 2.22 | 3 | 2.19 |
| No Response | 8 | 12.50 | 2 | 7.14 | 5 | 11.11 | 15 | 10.95 |
| **Total** | **64** | **100.00** | **28** | **100.00** | **45** | **100.00** | **137** | **100.00** |
| *Personal Computer (PC) at home* | | | | | | | | |
| With PC at home | 61 | 95.31 | 26 | 92.86 | 40 | 88.89 | 127 | 92.70 |
| Without PC at home | 2 | 3.13 | 2 | 7.14 | 5 | 11.11 | 9 | 6.57 |
| No Response | 1 | 1.56 | 0 | 0 | 0 | 0 | 1 | 0.73 |
| **Total** | **64** | **100.00** | **28** | **100.00** | **45** | **100.00** | **137** | **100.00** |

*Table 4. (Continued...)*

ICT Literacy of the Respondents by Discipline.

| Item of Integration | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | Total | |
|---|---|---|---|---|---|---|---|---|
| | *f* | *%* | *f* | *%* | *f* | *%* | *f* | *%* |
| *Internet connection at home* | | | | | | | | |
| With connection at home | 49 | 76.56 | 22 | 78.57 | 32 | 71.11 | 103 | 75.18 |
| Without connection at home | 10 | 15.63 | 4 | 14.29 | 11 | 24.44 | 25 | 18.25 |
| No Response | 5 | 7.81 | 2 | 7.14 | 2 | 4.44 | 9 | 6.57 |
| **Total** | **64** | **100.00** | **28** | **100.00** | **45** | **100.00** | **137** | **100.00** |
| *Social Network Sites (SNS)* | | | | | | | | |
| With SNS account | 40 | 62.50 | 19 | 67.86 | 38 | 84.44 | 97 | 70.80 |
| Without SNS account | 20 | 31.25 | 9 | 32.14 | 6 | 13.33 | 35 | 25.55 |
| No Response | 4 | 6.25 | 0 | 0 | 1 | 2.22 | 5 | 3.65 |
| **Total** | **64** | **100.00** | **28** | **100.00** | **45** | **100.00** | **137** | **100.00** |
| *Social Networking Site Accounts* | | | | | | | | |
| Facebook | 25 | 39.06 | 8 | 28.57 | 12 | 26.67 | 45 | 32.85 |
| Facebook and Friendster | 12 | 18.75 | 10 | 35.71 | 1 | 2.22 | 23 | 16.79 |
| Facebook and Twitter | 0 | 0 | 0 | 0 | 13 | 28.89 | 13 | 9.49 |
| Facebook, Friendster and Twitter | 1 | 1.56 | 0 | 0 | 2 | 4.44 | 3 | 2.19 |
| Friendster | 0 | 0 | 1 | 3.57 | 1 | 2.22 | 2 | 1.46 |
| Facebook, Twitter and Others | 1 | 1.56 | 0 | 0 | 1 | 2.22 | 2 | 1.46 |

*Table 4. (Continued...)*

*ICT Literacy of the Respondents by Discipline.*

| Item of Integration | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | Total | |
|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % |
| Facebook, Friendster and Others | 0 | 0 | 0 | 0 | 1 | 2.22 | 1 | 0.73 |
| Facebook, Friendster, Twitter and MySpace | 2 | 3.13 | 0 | 0 | 1 | 2.22 | 3 | 2.19 |
| Facebook and Others | 1 | 1.56 | 0 | 0 | 2 | 4.44 | 3 | 2.19 |
| Facebook, Friendster and MySpace | 0 | 0 | 0 | 0 | 3 | 6.67 | 3 | 2.19 |
| Facebook, Friendster, Twitter and Others | 0 | 0 | 0 | 0 | 1 | 2.22 | 1 | 0.73 |
| Facebook, Friendster, Twitter, MySpace and Others | 0 | 0 | 0 | 0 | 1 | 2.22 | 1 | 0.73 |
| No Response | 22 | 34.38 | 9 | 32.14 | 6 | 13.33 | 37 | 27.01 |
| Total | 64 | 100.00 | 28 | 100.00 | 45 | 100.00 | 137 | 100.00 |

that subscription to SNS is influenced by age of the respondents. Likewise, the study reveals that 45 (90%) of the instructors have an SNS account and 4 (100%) full professors indicated that they have at least one SNS account (Table 3). The result may imply that there is a greater potential for Facebook—a networking and social communication facility—to be easily integrated into their classes. Although Facebook is not designed to be a virtual learning management system, it generally captured the interest of many students. It is supported by Muñoz and Towner (2009) that pointed out that Facebook provides an alternative way of managing an online classroom, and it increases teacher-student and student-student interaction.

Ownership of a PC with Internet connection suggests a greater opportunity for the respondents to acquire additional skills not only on the Internet but other basic computer skills as well. This implies that there is an increasing opportunity for teachers to improve their confidence in ICT integration in education (Ismail et al, 2011). However, the data on the extent of accessibility to the new forms of communication may not be a guarantee that these faculty members efficiently maximize the use of these technologies. Likewise, it is surprising to discover that there are faculty members in the University who do not have an email account. Moreover, the study reveals that age is not statistically significant with PC ownership, and Internet connectivity. Likewise, the result reveals that the ICT literacy of the respondents is not affected by their status, gender, educational attainment and academic rank.

## Level of Familiarity of ICT Tools in Teaching Instruction by Discipline

*Social Sciences and Humanities*. An aggregate mean of 3.42 which has the description of "high" is reflected in the level of familiarity of ICT tools among the respondents from the Social Sciences and Humanities (Table 5), signifying that these faculty members can work with the ICT tools but need help from the expert. This means that the level of their familiarity is only limited to the basic components of the tools such as the basic operations, functions, and procedures, among others. Thus, help from experts are asked whenever complicated functions and operations in the ICT tools occur.

Specifically, there is a very high level of familiarity on word processing ($\bar{x}$= 4.61) and email ($\bar{x}$= 4.54). This indicates that this group of respondents can work on the tools alone without any help from

*Table 5.*

*Level of Familiarity of ICT Tools in Teaching Instruction by Discipline.*

| ICT Tool | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | Total | |
|---|---|---|---|---|---|---|---|---|
| | x | Description | x | Description | x | Description | x | Description |
| 1. E-Mail | 4.54 | Very High | 4.72 | Very High | 4.70 | Very High | 4.62 | Very High |
| 2. Word Processing (*e.g., MS Word*) | 4.61 | Very High | 4.83 | Very High | 4.48 | Very High | 4.60 | Very High |
| 3. Portable External Storage Devices (*e.g. flash disks*) | 4.07 | High | 4.82 | Very High | 4.66 | Very High | 4.36 | Very High |
| 4. Presentation Software (*e.g., MS Powerpoint*) | 3.93 | High | 4.78 | Very High | 4.61 | Very High | 4.27 | Very High |
| 5. Electronic Projection Devices (*e.g., LCD/DLP Projector*) | 4.06 | High | 4.33 | Very High | 4.25 | Very High | 4.16 | High |
| 6. Web Browsers (*e.g., Internet Explorer, Mozilla*) | 4.04 | High | 4.53 | Very High | 4.19 | High | 4.15 | High |
| 7. Social Networking (*e.g., Facebook, Friendster*) | 3.79 | High | 4.29 | Very High | 4.52 | Very High | 4.10 | High |
| 8. Online News | 3.94 | High | 4.27 | Very High | 3.95 | High | 3.98 | High |
| 9. Instant Messaging (*e.g., YM, MSN, Skype*) | 3.63 | High | 4.12 | High | 4.25 | Very High | 3.90 | High |
| 10. Spreadsheet (*e.g., MS Excel*) | 3.64 | High | 4.50 | Very High | 4.07 | High | 3.90 | High |
| 11. Internet Music Videos | 3.62 | High | 4.41 | Very High | 4.05 | High | 3.86 | High |
| 12. CD-ROM Materials | 3.73 | High | 4.06 | High | 3.93 | High | 3.84 | High |
| 13. Imaging Devices (*e.g, scanners*) | 3.61 | High | 4.22 | Very High | 3.88 | High | 3.79 | High |

*Table 5. (Continued...)*

*Level of Familiarity of ICT Tools in Teaching Instruction by Discipline.*

| ICT Tool | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | Total | |
|---|---|---|---|---|---|---|---|---|
| | $x$ | Description | $x$ | Description | $x$ | Description | $x$ | Description |
| 14. Multimedia | 3.38 | Moderate | 4.12 | High | 3.75 | High | 3.60 | High |
| 15. Online Groups, Forums, and Discussions | 3.24 | Moderate | 3.44 | High | 3.23 | Moderate | 3.27 | Moderate |
| 16. Charting/Graphing | 3.06 | High | 3.94 | High | 2.98 | Moderate | 3.16 | Moderate |
| 17. Video Conferencing | 3.00 | Moderate | 3.41 | High | 3.32 | Moderate | 3.16 | Moderate |
| 18. Audio Conferencing | 3.01 | Moderate | 3.12 | Moderate | 3.16 | Moderate | 3.08 | Moderate |
| 19. Digital Libraries | 3.03 | Moderate | 3.33 | Moderate | 3.07 | Moderate | 3.08 | Moderate |
| 20. Virtual Video Games | 3.00 | Moderate | 3.56 | High | 3.02 | Moderate | 3.08 | Moderate |
| 21. Web Blogs | 2.90 | Moderate | 3.38 | Moderate | 3.23 | Moderate | 3.07 | Moderate |
| 22. Wikis | 2.89 | Moderate | 3.24 | Moderate | 2.79 | Moderate | 2.90 | Moderate |
| 23. Web Publishing and Development | 2.64 | Moderate | 3.35 | Moderate | 2.64 | Moderate | 2.73 | Moderate |
| 24. Databases (*e.g., MS Access*) | 2.49 | Fair | 3.06 | Moderate | 2.91 | Moderate | 2.71 | Moderate |
| 25. Silliman Online University Learning (SOUL)–Virtual Classroom | 2.53 | Fair | 3.20 | Moderate | 2.58 | Fair | 2.63 | Moderate |
| 26. Course Management | 2.42 | Fair | 3.00 | Moderate | 2.33 | Fair | 2.46 | Fair |
| **Aggregate Mean** | **3.42** | **High** | **3.92** | **High** | **3.64** | **High** | **3.56** | **High** |

others. On the other hand, a "fair" level of familiarity is reflected in SOUL–Virtual Classroom ($\bar{x}$= 2.53), Databases ($\bar{x}$= 2.49) and Course Management Tools ($\bar{x}$= 2.42). This suggests that these respondents have just read about the tools from a book or heard about the tools from others and do not understand its functionalities.

A "moderate" level of familiarity is reflected also in ICT tools such as Multimedia ($\bar{x}$= 3.38), Online Groups, Forum and Discussion ($\bar{x}$= 3.24), Digital Libraries ($\bar{x}$=3.03), audio conferencing ($\bar{x}$= 3.01), Video Conferencing ($\bar{x}$= 3.00), Virtual Video Games ($\bar{x}$= 3.00), Web Blogs ($\bar{x}$= 2.90), Wikis ($\bar{x}$=2.89), and Web Publishing and Development ($\bar{x}$= 2.64). This suggests that this group of faculty members can understand the functionalities of the tools but do not know how to apply these tools in practice.

A "high" level of familiarity is also reflected in Portable External Storage Devices ($\bar{x}$= 4.07), Electronic Projection Devices ($\bar{x}$= 4.06), Web Browsers ($\bar{x}$= 4.04), Online News ($\bar{x}$= 3.94), Presentation Software ($\bar{x}$= 3.93), Social Networking ($\bar{x}$= 3.79), Spreadsheet ($\bar{x}$= 3.64), Instant Messaging ($\bar{x}$=3.63), Internet Music Videos ($\bar{x}$= 3.62), Imaging Devices ($\bar{x}$= 3.61), and Charting/Graphing ($\bar{x}$= 3.06). The result implies that this group of faculty members can use these tools but with help from an expert.

*Natural Sciences, Mathematics and Engineering.* Similarly, the level of familiarity of the ICT tools among the respondents from the Natural Sciences, Mathematics and Engineering disciplines shows a highest aggregate mean of 3.92 with a description of "high" compared to the other two groups of respondents (see Table 5). The result implies that this group of faculty members can work with the ICT tools but they need help from an expert. These results confirm a case study among mathematics professors by Yushau (2006) where more than 80% of the faculty were at least good in word-processing—the most commonly used software for writing memos, exams, and most journal publications.

In particular there is a "very high" level of familiarity (Table 5) of Word Processing ($\bar{x}$ = 4.83), Portable External Storage Devices ($\bar{x}$= 4.82), Presentation Software ($\bar{x}$= 4.78), E-Mail ($\bar{x}$ = 4.72), Spreadsheet ($\bar{x}$= 4.50), Web Browsers ($\bar{x}$ = 4.53), Internet Music Videos ($\bar{x}$= 4.41), Electronic Projection Devices ($\bar{x}$ = 4.33), Imaging Devices ($\bar{x}$ = 4.22), and Online News, Social Networking ($\bar{x}$ = 3.44). This group of teachers is better in terms of the number of ICT tools with a "very high" level of familiarity compared to those teachers in the Social Sciences and Humanities with only word processing ($\bar{x}$ = 4.61) and email ($\bar{x}$ = 4.54).

*Table 6.*

*Degree of Integration of ICT Tools into Teaching by Discipline.*

| Item of Integration | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | Total | |
|---|---|---|---|---|---|---|---|---|
| | $x$ | Description | $x$ | Description | $x$ | Description | $x$ | Description |
| 1. Using word processing in encoding test papers and other classroom handouts | 4.31 | Always | 4.84 | Always | 4.35 | Always | 4.40 | Always |
| 2. Using external storage devices like diskettes and flash drives to save personal computer files related to classroom instructions | 3.90 | Very Often | 4.16 | Very Often | 4.27 | Always | 4.06 | Very Often |
| 3. Using LCD projector during classroom lectures and discussions | 3.13 | Sometimes | 3.68 | Very Often | 4.39 | Always | 3.63 | Very Often |
| 4. Using presentation software like MS Powerpoint during lectures and discussions | 2.99 | Sometimes | 3.79 | Very Often | 4.48 | Always | 3.60 | Very Often |
| 5. Lecturing, reading and researching information on the internet | 3.57 | Very Often | 3.17 | Sometimes | 3.45 | Very Often | 3.48 | Very Often |

*Continued to next page...*

*Table 6. (Continued...)*

*Degree of Integration of ICT Tools into Teaching by Discipline.*

| Item of Integration | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | Total | |
|---|---|---|---|---|---|---|---|---|
| | x | Description | x | Description | x | Description | x | Description |
| 6. Downloading reference content materials from digital libraries | 3.29 | Sometimes | 3.44 | Sometimes | 3.19 | Very Often | 3.27 | Sometimes |
| 7. Using spreadsheet applications in doing basic mathematical operations like student's grade computation | 2.68 | Sometimes | 3.56 | Very Often | 3.47 | Very Often | 3.06 | Sometimes |
| 8. Scanning pictures, diagrams, figures and images for better illustration with the use of an electronic scanning device | 2.56 | Rarely | 3.37 | Sometimes | 3.57 | Sometimes | 3.01 | Sometimes |
| 9. Get updated with the latest news, events and updates of the university through www.su.edu.ph | 2.94 | Sometimes | 2.78 | Sometimes | 2.81 | Sometimes | 2.88 | Sometimes |

*Table 6. (Continued...)*

*Degree of Integration of ICT Tools into Teaching by Discipline.*

| Item of Integration | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | Total | |
|---|---|---|---|---|---|---|---|---|
| | x | Description | x | Description | x | Description | x | Description |
| 10. Playing cd/dvd in delivering course content and topic for lectures and discussions | 2.66 | Sometimes | 2.39 | Rarely | 3.23 | Sometimes | 2.81 | Sometimes |
| 11. Using database in saving any student-related works & activities (e.g. class record) | 2.71 | Sometimes | 3.26 | Sometimes | 2.70 | Sometimes | 2.79 | Sometimes |
| 12. Downloading music or video or graphics related to classroom lectures and discussions | 2.52 | Rarely | 2.58 | Rarely | 3.18 | Sometimes | 2.75 | Sometimes |
| 13. Social networking through online groups, fora, discussions | 2.44 | Rarely | 1.94 | Rarely | 2.56 | Rarely | 2.42 | Rarely |
| 14. Developing audio and video application to support topic discussions | 2.10 | Rarely | 2.26 | Rarely | 2.81 | Sometimes | 2.36 | Rarely |

*Continued to next page...*

Table 6. (Continued...)

*Degree of Integration of ICT Tools into Teaching by Discipline.*

| Item of Integration | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | Total | |
|---|---|---|---|---|---|---|---|---|
| | x | Description | x | Description | x | Description | x | Description |
| 15. Using email in communicating with your students for further instructions, offline discussions and feedbacking | 2.36 | Rarely | 1.94 | Rarely | 2.45 | Rarely | 2.34 | Rarely |
| 16. Connecting with students through a social networking site | 2.09 | Rarely | 1.65 | Never | 2.51 | Rarely | 2.17 | Rarely |
| 17. Using graphical or charting software in presenting statistical data | 1.90 | Rarely | 2.94 | Sometimes | 2.16 | Rarely | 2.13 | Rarely |
| 18. Connecting online with students via instant messaging for further instruction and discussion | 1.97 | Rarely | 1.89 | Rarely | 2.02 | Rarely | 1.98 | Rarely |
| 19. Using wikis to collaborate online information, references, links, etc | 1.94 | Rarely | 1.78 | Never | 1.86 | Rarely | 1.89 | Rarely |

*Table 6. (Continued…)*

*Degree of Integration of ICT Tools into Teaching by Discipline.*

| Item of Integration | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | Total | |
|---|---|---|---|---|---|---|---|---|
| | $x$ | Description | $x$ | Description | $x$ | Description | $x$ | Description |
| 20. Composing video for lectures and discussions | 1.38 | Never | 1.83 | Rarely | 2.09 | Rarely | 1.68 | Never |
| 21. Blogging to keep and share personal thoughts, and journals | 1.46 | Never | 1.76 | Never | 1.77 | Never | 1.61 | Never |
| 22. Developing web pages for course outline, content and materials | 1.39 | Never | 2.00 | Never | 1.59 | Rarely | 1.53 | Never |
| 23. Conducting audio conferencing | 1.51 | Never | 1.50 | Never | 1.55 | Never | 1.52 | Never |
| 24. Managing an online course | 1.38 | Never | 1.71 | Never | 1.59 | Never | 1.50 | Never |
| 25. Conducting video conferencing | 1.09 | Never | 1.42 | Never | 1.26 | Never | 1.19 | Never |
| 26. Conducting online classes at the Virtual Classroom of the SOUL System | 1.04 | Never | 1.56 | Never | 1.24 | Never | 1.18 | Never |
| Aggregate Mean | 2.36 | Rarely | 2.58 | Rarely | 2.71 | Sometimes | 2.51 | Rarely |

Further, the lowest level of familiarity in this group is "moderate," implying they can at least understand the functionalities of ICT tools: Web Blogs ($\bar{x}$ = 3.38), Web Publishing and Development ($\bar{x}$ = 3.35), Digital Libraries ($\bar{x}$ = 3.33), Wikis ($\bar{x}$ = 3.24), SOUL– Virtual Classroom ($\bar{x}$ = 3.20), Audio Conferencing ($\bar{x}$ = 3.12), Databases ($\bar{x}$ = 3.06), and Course Management Tools ($\bar{x}$ = 3.00).

The tools that are rated "high" (meaning, faculty members can work with the tools but need help from an expert) are: Instant Messaging ($\bar{x}$ = 4.12), Multimedia ($\bar{x}$ = 4.12), CD-ROM Materials ($\bar{x}$ = 4.06), Charting/Graphing ($\bar{x}$ = 3.94), Virtual Video Games ($\bar{x}$ = 3.56), Online Groups, Forum and Discussion ($\bar{x}$ = 3.44), and Video Conferencing ($\bar{x}$ = 3.41).

*Health Sciences.* The aggregate mean on the level of familiarity of the ICT tools among the respondents from the health sciences is 3.64 with a description of "high" (Table 5). Similar to the other two groups of respondents, this implies that the respondents cannot work with the ICT tools without the help of an expert. Although high in their extent of familiarity, the results may suggest that their familiarity is inadequate to perform complicated operations and functions in the ICT tools. Thus, help from experts are asked whenever complicated functions and operations in the ICT tools occur.

The list shows that the tools rated "very high" includes E-Mail, Portable External Storage Devices, Presentation Software, Social Networking, Word processing, Electronic Projection Devices, and Instant Messaging with a weighted mean of 4.70, 4.66, 4.61, 4.52, 4.48, 4.25, and 4.25, respectively. This data may imply that the faculty members in this group can work with the tools alone even without help from others. However, they do not understand the functionalities of tools such as Course Management ($\bar{x}$= 2.33) and SOUL-Virtual Classroom ($\bar{x}$= 2.58) all rated "fair" (Table 5).

Highly familiar ICT tools by this group of faculty members include Web Browsers ($\bar{x}$ = 4.19), Spreadsheet ($\bar{x}$= 4.07), Internet Music Videos ($\bar{x}$= 4.05), Online News ($\bar{x}$= 3.95), CD-ROM Materials ($\bar{x}$= 3.93), Imaging Devices ($\bar{x}$= 3.88), and Multimedia ($\bar{x}$= 3.75). This implies that the respondents of this group cannot work on these tools without the assistance and help from an expert. Lastly, moderately familiar tools include Video Conferencing ($\bar{x}$= 3.32), Web Blogs ($\bar{x}$= 3.23), Online Groups, Forum and Discussion ($\bar{x}$= 3.23), Audio Conferencing ($\bar{x}$= 3.16), Digital Libraries ($\bar{x}$= 3.07), Virtual Video Games ($\bar{x}$= 3.02), Charting/Graphing ($\bar{x}$= 2.98), Databases ($\bar{x}$= 2.91), Wikis ($\bar{x}$= 2.79), and Web Publishing and Development ($\bar{x}$= 2.64).

## Degree of Integration of ICT Tools into the Teaching Instruction by Discipline

*Social Sciences and Humanities.* The aggregate mean of the degree of integration of ICT tools into teaching among the faculty from the Social Sciences and Humanities (Table 6) is 2.36 with the description of "rarely". This implies that this group of faculty integrates the ICT tools at least once a semester.

The group always uses word processing in encoding test papers and other classroom handouts with a weighted mean of 4.31 (Table 6). This reveals that this group integrates the tool at least once a day. On the other hand, items 20, 21, 22, 23, 24, 25 and 26 are never integrated, implying that these items are not done by the faculty. These include composing video for lectures and discussions ($\bar{x}= 1.38$), blogging to keep and share personal thoughts and journals ($\bar{x}= 1.46$), developing web pages for course outline, content and materials ($\bar{x}= 1.39$), conducting audio conferencing ($\bar{x}= 1.51$), managing an online course ($\bar{x}= 1.38$), conducting video conferencing ($\bar{x}= 1.09$), and conducting online classes at the virtual classroom of the SOUL system ($\bar{x} = 1.04$).

Likewise, results show that using external storage devices like diskettes and flash drives to save personal computer files related to classroom instruction and lecturing, reading and researching information on the Internet are integrated very often. It implies that this group of faculty integrates the tools at least once a week. Items 3, 4, 6, 7, 9, 10 and 11 are integrated "sometimes." It signifies that this group performs at least once a month the following eLearning activities: using LCD projector during classroom lectures and discussions, using presentation software like MS Powerpoint during lectures and discussions, downloading reference content materials from digital libraries, using spreadsheet applications in doing basic mathematical operations like student's grade computation, get updated with the latest news, events and updates of the university through www.su.edu.ph, playing cd/dvd in delivering course content and topic for lectures and discussions, and using database in saving any student-related work and activities. Rarely integrated ICT tools (Table 6) indicating that faculty of this group integrate the tools at least once a semester include items 8, 12, 13, 14, 15, 16, 17, 18 and 19.

*Natural Sciences, Mathematics and Engineering.* A 2.58 aggregate mean of the degree of integration of ICT tools into the teaching instruction among the faculty from the Natural Sciences, Mathematics

and Engineering (Table 6) is described as "rarely". The result shows a similar degree of integration among the faculty from the Social Sciences and Humanities, implying that the integration of the ICT tools is done at least once a semester.

Specifically, word processing in encoding test papers and other classroom handouts is always integrated, with a weighted mean of 4.84. This reveals that all groups of respondents integrate word processing at least once a day. Items 16, 19, 21, 23, 24, 25 and 26 are never integrated. These are: social networking ($\bar{x}$= 1.65), collaborating through wikis ($\bar{x}$= 1.78), blogging ($\bar{x}$= 1.76), audio conferencing ($\bar{x}$= 1.50), online course management ($\bar{x}$= 1.71), video conferencing ($\bar{x}$= 1.42), and SOUL online classes ($\bar{x}$= 1.56).

A description of "very often" (Table 6) implies that integration is done at least once a week. The items include: using external storage devices like diskettes and flash drives to save personal computer files related to classroom instructions, using LCD projector during classroom lectures and discussions, using presentation software like MS Powerpoint during lectures and discussions, downloading reference content materials from digital libraries, and using spreadsheet applications in doing basic mathematical operations like student's grade computation.

Items 5, 8, 9, 11 and 17 are described as "sometimes" integrated, implying  that the faculty in this group perform at least once a month the following activities: lecturing, reading and researching information on the Internet, scanning pictures, diagrams, figures and images for better illustration with the use of an electronic scanning device, get updated with the latest news, events and updates of the university through www.su.edu.ph, using database in saving any student-related works & activities (e.g. class record), and using graphical or charting software in presenting statistical data. Items 10, 12, 13, 14, 15, 18, 20 and 22 are described "rarely" which implies that ICT integration is done only at least once a semester into their teaching.

*Health Sciences*. An aggregate mean of 2.71 (Table 6) with a description of "sometimes" reflects the respondents' degree of integration of ICT tools into teaching. This signifies that the faculty from the Health Sciences integrates the ICT tools at least once a month. The result shows that this group of faculty is better in their degree of integration compared to the other groups of respondents.

There are four tools that are integrated at least once a day. This integration includes the following activities: using word processing

in encoding test papers and other classroom handouts, using external storage devices like diskettes and flash drives to save personal computer files related to classroom instructions, using LCD projector during classroom lectures and discussions, and using presentation software like MS Powerpoint during lectures and discussions.

On the other hand, items 21, 22, 23, 24, 25 and 26 are described "never", suggesting that ICT integration never takes place in these tools: blogging to keep and share personal thoughts, and journals ($\bar{x}$= 1.77), developing web pages for course outline, content and materials ($\bar{x}$= 1.59), conducting audio conferencing ($\bar{x}$= 1.55), managing an online course ($\bar{x}$= 1.59), conducting video conferencing ($\bar{x}$= 1.26), and conducting online classes at the virtual classroom of the SOUL system ($\bar{x}$= 1.24). The result also shows that this group of respondents is almost the same to the respondents from the Social Sciences and Humanities except for composing video for lectures and discussions which is described as "rarely" for Health Sciences. The result further reveals that there are five tools that are never integrated among the three groups of respondents: blogging to keep and share personal thoughts, and journals, conducting audio conferencing, managing an online course, conducting video, and conducting online classes at the virtual classroom of the SOUL system.

Likewise, activities such as lecturing, reading and researching information on the Internet, and using spreadsheet applications in doing basic mathematical operations like student's grade computation are integrated very often (Table 6) or at least once a week. This is a similar degree of integration with the group of respondents in the Natural Sciences, Mathematics and Engineering in using spreadsheet application. Likewise, this group of respondents has a similar degree of integration with the group of respondents in the Social Sciences and Humanities in lecturing, reading and researching information on the Internet.

Items 6, 8, 9, 10, 11, 12 and 14 are described as "sometimes" integrated, suggesting that the faculty in Health Sciences performs at least once a month the following: downloading reference content materials from digital libraries, scanning pictures, diagrams, figures and images for better illustration with the use of an electronic scanning device, get updated with the latest news, events and updates of the university through www.su.edu.ph, playing cd/dvd in delivering course content and topic for lectures and discussions, using database in saving any student-related work and activities, downloading music or video or graphics related to classroom lectures and discussions, and

developing audio and video application to support topic discussions. There are two items described as "sometimes" integrated common to the three groups of respondents. These are getting updated with the latest news, events and updates of the university through www. su.edu.ph and using database in saving any student-related work and activities.

Rarely integrated ICT tools were items 13, 15, 16, 17, 18, 19 and 20, indicating that this group integrates the tools at least once a semester. There are three tools described "rarely" which are also common to the three groups of respondents. These are social networking through online groups, fora, discussions, using email in communicating with your students for further instructions, offline discussions and feedbacking, and connecting online with students via instant messaging for further instruction and discussion.

## Differences in the Level of Familiarity and Degree of Integration of ICT Tools Among Disciplines

The significance value comparing the groups of respondents by discipline is .023 (Table 7), implying there is a disparity or significant difference in the mean level of familiarity among the three groups of respondents. Specifically, there is a significant difference between the level of familiarity for the respondents from the Social Sciences and Humanities and Natural Sciences, Mathematics and Engineering and the respondents from the Health Sciences, $F = 3.968$, $p < .05$. On the other hand, the *p-value* between discipline and degree of integration is 0.338, which is higher than 0.05 significance value. This suggests that there is no gap or no significant difference in the mean level of degree of integration among the three groups of respondents, $F = 0.960$, $p > .05$.

*Table 7.*

*Test of Differences Between the Level of Familiarity and Degree of Integration of ICT.*

| Variable | F | $\varrho$ | Remark |
|---|---|---|---|
| Discipline and Level of Familiarity | 3.968 | .023 | Significant |
| Discipline and Degree of Integration | .960 | .338 | Not Significant |

## Relationship Between Discipline and the Level of Familiarity and Degree of ICT Integration

The data reveals that discipline is not statistically associated with level of familiarity. This implies that the level of familiarity of the ICT tools is not affected by the discipline of the faculty. On the other hand, discipline and degree of integration are statistically associated with each other at 0.05 level. A positive evidence of relationship where the computed value (23.700) is higher than the tabular value shows that the degree of integration of ICT tools is influenced by the discipline of the faculty. In this study, the Health Sciences group demonstrates the highest level of integration.

## Reasons Hindering the Integration of ICT Tools into Teaching

The primary reason that hinders the respondents in the Social Sciences and Humanities from integrating ICT tools in their teaching is the inadequate number of electronic audio and visual equipment (73.4%). For the Natural Sciences, Mathematics and Engineering, the major reasons include the following: inadequate number of electronic audio and visual equipment, limited number of Internet-connected PCs at the faculty room, and unavailability of software applications installed in the computer for faculty use (75.9%). The limited number of Internet-connected PCs at the faculty room (84.8%) is also the number one reason that hinders the respondents in the Health Sciences from integrating ICT tools. The last two reasons that hinder all the groups of respondents from integrating ICT tools (Table 8) are being afraid to use computers and other electronic equipment and being used to a traditional mode of instruction. This implies that all groups of respondents are willing to learn and be trained on the use of ICT tools.

*Table 8.*

*Reasons That Hinder the Integration of ICT Tools Into Teaching Instruction.*

| Reason | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | All Disciplines | |
|---|---|---|---|---|---|---|---|---|
| | *f* | % | *f* | % | *f* | % | *f* | % |
| 1.Limited number of Internet-connected PCs at the faculty room. | 41 | 64.1 | 22 | 75.9 | 39 | 84.8 | 103 | 75.2 |
| 2. Inadequate number of electronic audio and visual equipment | 47 | 73.4 | 22 | 75.9 | 27 | 58.7 | 97 | 70.8 |
| 3. Limited bandwidth that results to slow internet connection for online activities. | 37 | 57.9 | 19 | 65.5 | 37 | 80.4 | 94 | 68.6 |
| 4.Inadequate number of computers available at the faculty room. | 42 | 65.6 | 16 | 55.2 | 29 | 63 | 88 | 64.2 |

*Table 8. (Continued...)*

*Reasons That Hinder the Integration of ICT Tools Into Teaching Instruction.*

| Reason | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | All Disciplines | |
|---|---|---|---|---|---|---|---|---|
| | *f* | % | *f* | % | *f* | % | *f* | % |
| 5. Lack of knowledge and training in using the available e-learning tools. | 42 | 65.6 | 12 | 41.4 | 29 | 63 | 84 | 61.3 |
| 6. No enough time to develop e-learning materials for classroom instruction. | 35 | 54.7 | 13 | 44.8 | 30 | 65.2 | 79 | 57.7 |
| 7. Get used and contented with the traditional mode of instruction. | 19 | 29.7 | 6 | 20.7 | 9 | 19.6 | 34 | 24.8 |
| 8. Afraid to use computers and other electronic equipment. | 1 | 1.96 | 2 | 6.9 | 2 | 4.3 | 5 | 3.6 |

*Table 8. (Continued...)*

*Reasons That Hinder the Integration of ICT Tools Into Teaching Instruction.*

| Reason | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | All Disciplines | |
|---|---|---|---|---|---|---|---|---|
| | *f* | % | *f* | % | *f* | % | *f* | % |
| 9. Unavailability of software applications installed in the computer for faculty use. | 41 | 64.1 | 22 | 75.9 | 36 | 78.3 | 100 | 73 |

The other reasons that hinder the social sciences and humanities from integrating ICT tools include the following: inadequate time to communicate with students because of heavy schedules and full loads; and highly specialized field-auditing and outdated facilities and equipment. Likewise, the respondents from the natural sciences, engineering and mathematics indicated also other reasons of not integrating the ICT tools such as outdated facilities, and installation of software to department's pc's are controlled by the computer center. Further, the respondents from the health sciences indicated additional reasons for not integrating the ICT tools such as: cheating during online exams; lack of time for preparing such since their load requires all of their working time; no unlimited internet connection; conferencing, assignment giving with students over the net is somewhat informal and may be a source of leakage and intellectual property rights will be compromised; and lack opportunities for training. Correct integration of ICT tools comprises a major change in the teaching and learning process. ICT integration is a complex phenomenon that involves understanding teachers' motivations, perceptions, and beliefs about learning and technology (Keengwe, Onchwari & Wachira, 2008).

**Willingness to Integrate and To Be Trained**

There is a bigger percentage among all groups of respondents who are willing to integrate ICT into their teaching instruction (Table 9) and are willing to be trained in using ICT tools in the teaching-learning process. This is a positive indication that teachers from the three disciplines are open and ready to learn the ICT tools. This means that the idea and principle of integrating ICT in the University is already an acceptable mode in the teaching and learning process.

**Salient Findings**

All of the ICT tools are highly familiar to all groups of respondents, suggesting that they can work with the ICT tools but need help from an expert. Specifically, ICT tools such as e-mail and word processing are very highly familiar to all groups of respondents. This implies that the respondents can work alone without help from an expert. CD-ROM materials are highly familiar to all groups of respondents, indicating that the respondents can work but need help from an expert. Audio

Table 9.

*Willingness to Integrate and To Be Trained in Using ICT Tools*

| Willingness | Social Sciences and Humanities | | Natural Sciences, Mathematics and Engineering | | Health Sciences | | All Disciplines | |
|---|---|---|---|---|---|---|---|---|
| | *f* | % | *f* | % | *f* | % | *f* | % |
| *Willing to integrate ICT into Teaching Instruction* | | | | | | | | |
| Yes | 60 | 93.8 | 26 | 89.7 | 44 | 95.7 | 130 | 93.53 |
| No | 2 | 3.1 | 0 | 0 | 0 | 0 | 2 | 1.44 |
| No Response | 2 | 3.1 | 3 | 10.3 | 2 | 4.3 | 7 | 5.04 |
| **Total** | **64** | **100** | **29** | **100** | **46** | **100** | **139** | **100.00** |
| *Willing to be trained* | | | | | | | | |
| Yes | 60 | 93.8 | 25 | 86.2 | 43 | 93.5 | 128 | 92.09 |
| No | 2 | 3.1 | 0 | 0 | 0 | 0 | 2 | 1.44 |
| No Response | 2 | 3.1 | 4 | 13.8 | 3 | 6.5 | 9 | 6.47 |
| **Total** | **64** | **100** | **29** | **100** | **46** | **100** | **139** | **100.00** |

conferencing, digital libraries, web publishing and development, web blogs, and wikis are moderately familiar to all groups of respondents. This implies that the respondents can understand the functionalities of the ICT tools but they do not know how to apply it. None of the ICT tools are not familiar to all groups of respondents.

The faculty members in the Health Sciences are better in terms of the degree of integration of the ICT tools compared to the other non-ICT faculty in the university. They have integrated the ICT tools at least once a month compared to other non-ICT faculty that rarely integrate the ICT tools at just a minimum of at least once a semester.

All non-ICT teachers in the university never conduct audio and video conferencing; manage an online course; blog to keep and share personal thoughts, and journals; and conduct online classes at the Virtual Classroom of the Silliman Online University Learning (SOUL) System. At the very least, however, all non-ICT teachers in the university use word processing in encoding test papers and other classroom handouts. Database and online news are the ICT tools that are integrated at least once a month into the teaching instruction of non-ICT teachers in the university.

Aside from the use of word processing, external storage devices are the most used ICT tools into the teaching instruction of the faculty in the Social Sciences and Humanities, and Natural Sciences, Mathematics and Engineering. The teachers in the Health Sciences always use presentation software like MS Powerpoint during lectures and discussions. Conducting online classes is at the bottom among the ICT tools that are never used by the Social Sciences and Humanities, and Health Sciences while conducting video conferencing is the least integrated ICT tool by the Natural Sciences, Mathematics and Engineering.

There is a significant difference in the mean level of familiarity of the ICT tools among the three groups of respondents. However, there is no significant difference in the mean level of degree of integration among the three groups of respondents. Further, the level of familiarity of the three groups of respondents has a correlation with their degree of integration of the ICT tools into their teaching.

The primary reason that hinders the respondents from integrating ICT tools in their teaching is the limited number of Internet-connected PCs at the faculty room. There is a bigger percentage among all groups of respondents who are willing to integrate ICT into their teaching. It also shows that all groups of respondents are willing to be trained in using ICT tools in the teaching-learning process.

## CONCLUSIONS
## AND RECOMMENDATIONS

As technology advances very rapidly, educational institutions like Silliman University are trying to embrace the new trends in the teaching-learning process. However, these new and emerging technologies challenge the traditional process of teaching and learning, and the way education is delivered.

The non-ICT faculty members in Silliman University are technologically challenged in the use of ICT tools in their teaching. Their level of familiarity requires help from an expert for them to work and to use ICT tools. It is particularly alarming that they rarely use and integrate the tools into their teaching, for the reason of lack of hardware and software resources installed in academic units.

ICT integration in education is a shared responsibility. It requires dedication and participation among the stakeholders in the academe. All stakeholders should always remember that technology alone does not guarantee motivation and improvement in teaching-learning. There should be policies, guidance, and training on the appropriate use of these tools in the teaching-learning activity in the classroom. It is highly recommended that school administration seriously take part in promoting innovative learning experience. Factors to consider for successful and sustainable ICT integration in teaching and learning include [a] availability of ICT infrastructure; [b] technical support and maintenance options; [c] pedagogical support; [d] availability of ICT-related courses; [e] teachers' self-perceived confidence in accomplishing certain tasks involving the use of ICT; [f] principals' visions regarding pedagogy and ICT; [g] pedagogical practices using ICT; and [h] teachers' perceptions about the positive impact of ICT (Blignaut, Hinostroza, Els & Brun, 2012). They should also consider offering incentives for faculty who use online learning methodologies on a consistent basis, and include online learning use and competencies in the faculty evaluation.

Specifically, the Office of the Vice President for Academic Affairs in Silliman University through the Office of Instruction should call for and organize IT Enhancement trainings relative to the needs of each discipline. The College of Computer Studies and the SOUL team should develop capability-building and design

training programs suited to the needs of each discipline. Faculty from the College of Computer Studies and other computer-related academic units should actively assist in delivering the enhancement training. The Office of the Vice President for Finance and Administration through the office of the Management Information Systems should strategically review and revisit its policy of responding to the barriers to technology integration. Procurement of ICT tools should be carefully done per discipline in order to maximize the resources of the university. Non-ICT colleges and departments should also revisit their tactical plans to incorporate need-based ICT-training. It is also recommended that the non-ICT faculty seriously participate in any training and take responsibility for integrating ICT tools to promote innovative teaching experience in classroom instruction. Lastly, it is recommended that a similar study be to focus on mobile tools such as smart phones, tablets, notebooks and other tools that are transformative format.

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