

## **URBAN CLASS COMPUTING IN HIGHER EDUCATION: PROMISING OR PERILOUS**

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### **Abstract**

This paper draws the information communications technology profile of a group of tertiary students in the old, prestigious De La Salle University-Manila situated in an urban setting; gets their premature perception of urban class computing and finally, determines how the idea constructs a new form of learning behavior.

### **What is Urban Computing**

“Urban computing is the integration of computing, sensing and actuation technologies into everyday urban living and lifestyles” (Kindberg, Chalmers, & Paulos, 2007, p. 18). The term has emerged “as a label for research into mobile and pervasive computing situated within urban contexts” (Greenfield & Shepard, 2007, p. 8) Proponents of urban computing are looking into the various ways information communication technologies are used in the urban setting with the intention “to produce fully integrated designs and possibly overcome deployment challenges” (Kindberg et al., 2007, p.19).

Kindberg and his research group see urban setting shaping social behavior. More and more people are engaging in urban computing aside from the typical phone calls or short messaging system (SMS) like exchanging files using Bluetooth technology (Kindberg et al., 2007, p. 20), taking pictures of accidents or relevant events, using the mobile phone to find a restaurant in the city.

Urban computing hopefully leads to the idea of ambient informatics, a state in which information is freely available at the point in space and time someone requires it (Shepard et al., 2007, p.10).

And urban computing is still in its early stages and most of the applications being developed are geared toward addressing city living and public spaces such as supporting pedestrian navigation through a mobile phone, design of music-sharing application for passengers or a mobile social software that may address digital divide between inner-cities and suburban areas using art as a model. And this research area is very much in need of data about urban computing phenomena (Kindberg et al., 2007, p. 20).

## **The Premise of Urban Class Computing**

Envision a wifi-ready campus where students are using laptops in the hallways, in the classroom or in the canteen — accessing online library resources, finding a course elective online, checking project requirements and deadlines set by the professor. A student taking notes in class using a laptop and a student using her phone camera to copy the assignment on the board are common sights. Student interactions rely heavily on the e-groups, instant messaging and the SMS. While these are mental images in the provincial areas, these are concrete experiences of how students perform urban computing in an urbanized ICT-empowered university setting like the De La Salle University in Manila.

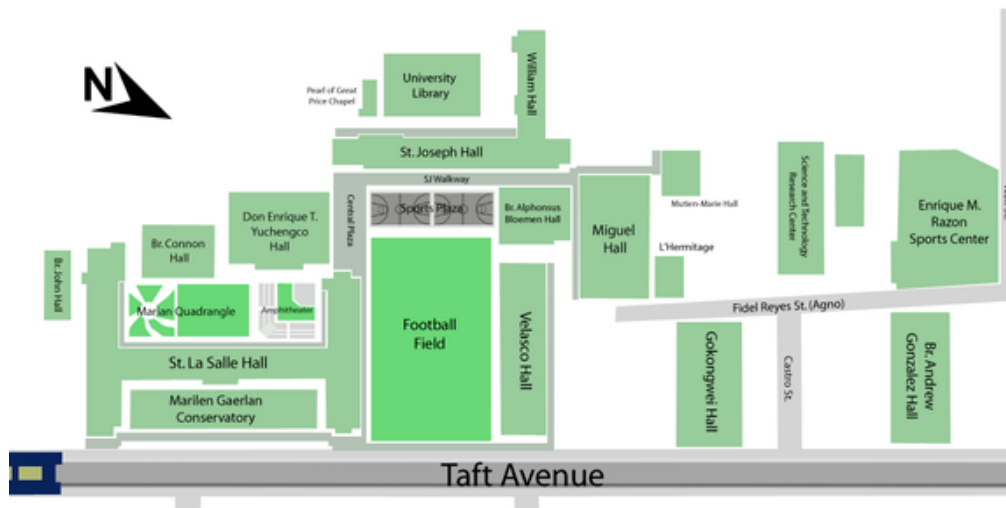
While urban computing sees how social behaviors are framed, this paper attempts to deduce how urban computing constructs a new form of learning behavior. Indeed, there are other manifestations but getting the views of the students will be more helpful. Urban class computing (UCC) is coined as a fabric of urban computing. Urban class computing is the natural cohesion of learning and technology among individuals. This scenario commonly takes place in urban setting where there is wide and easy access to technology resources. It is performed by any individual, young or old, that engages in any form of learning.

## **The Survey of the ICT Tertiary Students of the De La Salle University**

### **The De La Salle University-Manila Campus**

The De La Salle University-Manila is one of the oldest, private, Catholic university in the country. It was founded by the Brothers of the Christian Schools, or the Lasallian Brothers of France, in 1911. It is situated in Manila, the capital of the Philippines. The campus has 19 buildings at present situated in a 5-hectare lot and the oldest building, the St. La Salle hall, was built in 1921 (De La Salle University, 2009). Similar to most of the universities in the cities, construction of the buildings were not planned and built at the same time. In the case of the DLSU-M campus, the old buildings have a neoclassical architecture while the others are of less decorative modernist style. The Yuchengco, Gokongwei and Gonzales halls, the Marilen Gaerlan conservatory, as well as the Enrique Razon Sports and the Science and Technology Research Centers were all built after the 1990s. Figure 1 shows the campus map.

Figure 1: DLSU-M Campus Map



[http://en.wikipedia.org/wiki/De\\_La\\_Salle\\_University-Manila](http://en.wikipedia.org/wiki/De_La_Salle_University-Manila)

The university has over 750 computer workstations of varying specifications spread in 30 different laboratories for student use in the campus. There are wired networks and wireless connections available for computing, Internet and online services' access. Internet infrastructure dedicated to university is 26Mbps bandwidth. (DLSU Web Portal, 2005)

### The Survey

To work on the idea of the urban class computing, a survey was conducted among the tertiary junior students of the Information Technology Department of the College of Computer Studies (CCS) of DLSU-M, and CCS is recognized as a Center of Excellence in Information Technology by the Commission of Higher Education (De La Salle University, 2009). The respondents are students of the Information Technology department.

The survey was conducted to determine the profile of the tertiary students in an ideal urban university setting equipped with ICT facilities and to determine their perception of the new ways of learning and/or how they view the strong usage of technology for learning with the premise that certain learning behaviors are also developed in this kind of scenario.

In a survey of 98 students, the following data were derived. (See Table 1.)

Table 1: Basic Demographics of the Students

Gender	M	F	TOTAL		
	63	35	98		
Birth Year	1987	1988	1989	1990	1991
	4	33	47	14	0
Age Entered College	15	16	17	18 and Above	
	10	42	36	10	
Original Birth Place	Metro Manila	Province	Outside the Philippines		
	75	21	2		
Childhood Location	Metro Manila	Province	Outside the Philippines		
	75	21	4		
Study Location	Metro Manila	Outside Metro Manila			
	93	5			
Have Mobile Phone	Yes	No			
	98	0			
# of mobile phones	one	two	three	more than three	
	57	39	1	1	
Have Laptop	Yes	No			
	83	15			
no. of Laptops	one	two	three	more than three	
	38	49	2		

Ninety-three percent stay in Metro Manila while studying and only five percent stay in suburban areas. While everyone enjoys a mobile phone, 39% have an average of two mobile phones, 49% have an average of two laptops and only 7% among the students use a Macbook.

Figure 2: Laptop and Computer Statistics of the Students

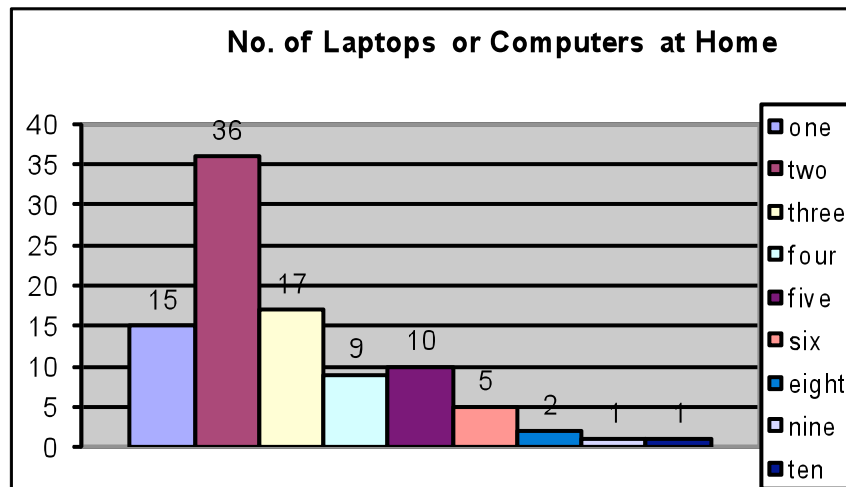
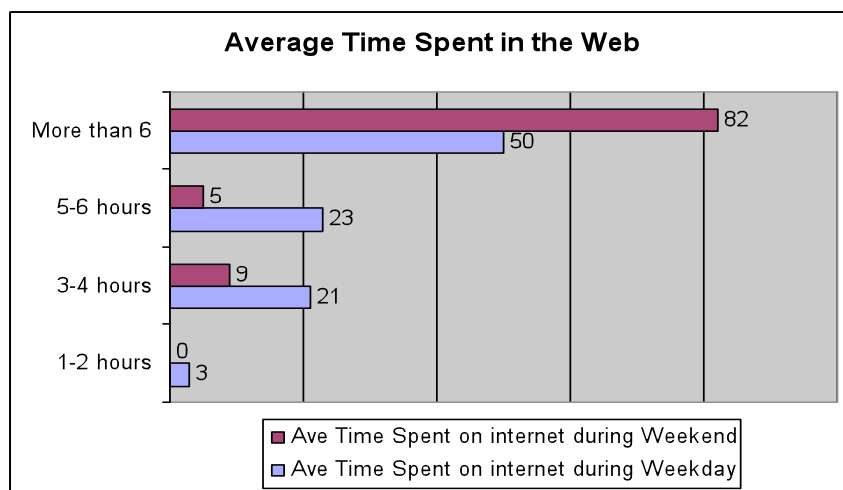


Figure 3: The Students' Average Time Surfing the Web



Over 50% have digital cameras, digital video cameras; have wireless routers, landlines and/or broadband internet connections for their internet service requirements. Aside making local calls (52%) and SMSs (87%), the students commonly use their mobile phones for scheduling their activities (54%), note-taking (30%), reading e-mail (54%) and playing music or listening to radios (51%).

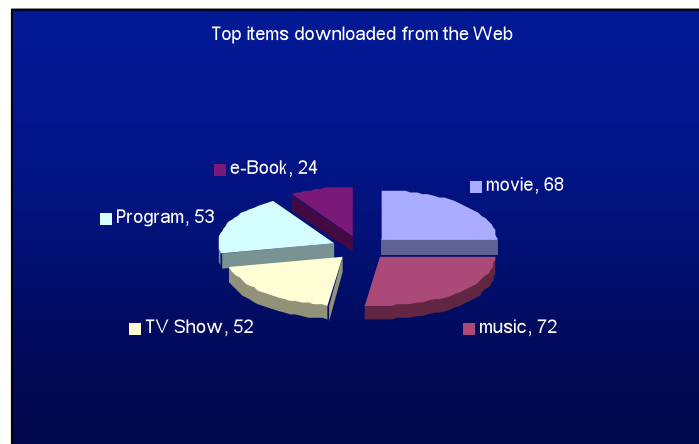
The top three preferred social network sites are Multiply (89%), Friendster (88%) and Facebook (83%).

Top activities that the students do when engaged in the web are the following~ instant messaging, e-mail, social networking, doing research, downloading files, watching videos online, online chat and online games. Common items downloaded from the web are music files, movies, programs/software, TV shows and e-books.

Table 2: Top Web Activities of the Students

E-mail	94%
IM	96%
Online Chat	78%
Doing Research	83%
Downloading files	83%
Online Games	61%
Social Networking	86%
Watching Video online	81%

Figure 4: Top Items Downloaded by the Students from the Web



While 55% prefer to use the web for researching because of the faster way of gathering data or information, 48% still go to the library to research and 58% still use books for references.

Students are motivated to go to school because of the presence of friends and classmates, to get good grades and learn more, having daily allowances and the hope of earning a degree. Top answers why they are not motivated to go to school are because of lack of sleep (20%) and boring classes (19%).

Table 3: What Motivates Students to go to School

Driving car	6	Becoming popular	3	
Daily allowance	27	Compliance to req'ts	20	
Presence of friends/classmates	34	Get good grades	28	
Good professors	25	Learn more	28	
Idea of diploma	24			
Others	Org reponsibility	Meet new people	Fun	Experience
	2	2	2	2

Table 4: Students' View of Urban Class Computing

Top Descriptions of What UCC is	
Emerging trend on data and information gathering	5
Future of education	4
Natural cohesion of technology and learning	4
Helpful	6
Should not be abused	5
very influential when it comes to doing our activities/necessary for learning	4
New way of learning	3
Awesome	3
good	8
Future of education	4
Efficient/effective for students in learning	3
wonderful result of technology	3
Starting a new generation of learning/new way of uplifting education/innovative way of reaching students	3

## Synthesis of the Survey

The survey conducted was able to gather relevant preliminary data that serves as springboard to the idea of UCC.

The typical profile of the student studying in an urbanized computing environment and/or engaged in urban class computing would be an individual who prioritizes mobile and web connectivity for communication and information access; gives

importance to virtual interactions as part of social activities (exhibited in e-mail, online chat, instant messaging and social networking), has high consideration to quality, traditional educational structure (evidenced by doing research in the library and the web, high level use of books and e-books and preference of physically going to school).

A new form of learning behavior becomes evident — self-service learning skills. Self-service learning skill refers to the habitual ability to get fast, relevant and immediate knowledge and information, manage and organize time and effort, experience online, mobile and physical interactions and views technology engagement as second nature together with learning.

UCC is an acceptable jargon and idea to the students. The survey earned favorable results with the students' perspective of UCC based on the survey as *“good, helpful, an emerging trend of gathering data and information, necessary to learning and that it should not be abused.”*

The initial definition supplied as the natural cohesion of learning and technology is acceptable. But UCC can further be described as a condition wherein there is a natural, opportunistic reliance on the ICT tools to facilitate efficient and immediate task and learning delivery be it in the classroom or at home, or anywhere in the campus.

While the profile will show that the students have access to all the ICT tools that will assist them in their studies, the approbation for quality, traditional on-campus educational structure is very evident. Students' view of physically going to school gives high regard to the need for (1) social interaction, (2) more learning, (3) getting good grades, (4) having daily allowances, (5) interactions with good professors and (6) earning a degree,

Learning or studying in an urban university prescribes a technology learning tool. This is favorable to the students who have access to a wide range of ICT tools. For students coming from and staying in the suburban or rural areas while studying with limited technology tools it will be a disadvantage. But having and not having the ICT tools does not guarantee success at this point.

When discussions in urban computing came about, it focused on open and public spaces and city life with little regard on classrooms and/or university systems. The area of UCC should grow and expand. Projects related to the permissible use of ICT in the classroom or campus should start to shape such as an application that can be used in a classroom discussion that can generate instant feedback from students with the use of mobile phones providing real-time statistics of the answers; an application to allow mobile commerce and blogging among young

student entrepreneurs; mobile and online student survey or student government elections; or geotagging of campus activities and job openings for student references.

### **Challenges Faced by the Urban University**

According to Larsen in his Organization for Economic Cooperation and Development (OECD) report, there are three major impacts of ICT to education. First, education is a prerequisite to a knowledge-based economy. Second, ICTs are powerful tool for diffusing knowledge and information and third, ICTs induce innovations in the ways of doing things (Larsen, 2005). Higher education institutions will not survive if the role of ICT in education is set aside. For leading urban colleges and universities attuned to the changing needs of the educational system and DLSU that has the highest education level of accreditation in the Philippines, major challenges face these universities.

- Provision for changing ICT infrastructure from wired connection to wireless or wifi connections or adoption of wifi connections will have to be in place. Most universities like DLSU-M has continuously acquired computers, expanded laboratories to provide facilities for digital literacy. The use of these facilities at present will mean acquiring computer skills in the confines of the labs. This setup does not encourage UCC that can take place anywhere in the campus.
- Universities that have been adept to ICT changes in the past have created numerous computer laboratories for ICT related hands-on courses and to cater to student computing needs. These labs may be in obsolescence or may not be as functional or suitable anymore with the availability of wireless connections and advent of mobile computing.

In the case of the DLSU campus, the building expansion is continuous as well as the design and creation of new, small and big rooms for new purposes. The 30 laboratories that house the 750 computer workstations may be excessive now with the availability of wireless connections that allow students to freely use their laptops anywhere in the campus.

On the other hand, keeping the wireless connections always available, prioritizing the tasks or the users requiring the connections, sustaining the demand of the connections particularly during the peak of the school term will also be some of the immediate issues to be faced by DLSU-M.

- Classroom policies on the use of technology will have to be studied in the light of what will be more conducive to learning, what is

permissible and extent of technology use. For instance, use of laptops or mobile devices like mobile phones or personal digital assistants were never used or not allowed to be used in the classroom during lectures. With the advent of UCC, use of the laptops and mobile devices may augment classroom interactions as well as support learning that will take place.

- Expansion in the form of creation of buildings will have to be planned to accommodate sustainable ICT infrastructure and ambient informatics.
- Sustaining the ICT infrastructure may require urban setting universities to establish linkage with private companies to be able to deliver and sustain quality ICT service facilities for learning.

## Conclusions

Is UCC promising or perilous? UCC can be a threat to the ICT infrastructure invested upon by most universities in the urban setting with the old paradigm of learning activities taking place inside the classroom or laboratory. It is because the UCC environment suggested by this paper encompasses not just the lab setup but the entire campus. UCC is supporting and sustaining the immediate learning computing needs of the students.

Universities catering to students in a highly urbanized environment cannot ignore the fact that the profile of their students exhibits individuals adept with technology, constantly engaged in UCC activities and self-service learning skill is inherent.

There are other pervasive learning and computing ideas that may overlap with the idea of urban class computing and the new idea of self-service learning. Crossing and/or metamorphosis of knowledge and ideas may occur but the positive perspective of creating a sustainable, learning computing environment is there. As this study hopes to inspire other related research projects, this should also lead to addressing the under-resourced universities and students in the urban setting.

Universities will have to make sustainable plans of creating ambient informatics structure to further support the drive for self-service skills of the students.

The more favorable response and positive attitude exhibited by the students towards the idea of urban class computing, the easier to create scenarios that will allow the design and development of an urban computing environment.

It is recommended to gather more information from other sets of students like the graduate students and tertiary students from non-IT majors and collect faculty ICT-related teaching experiences.

Finally, the paper was able to draw a good profile of UCC students, coined a more descriptive definition of UCC and had drawn the concept of a self-service learning skill, fundamental to UCC. Self-service learning skill will have to be probed and scrutinized further together with UCC. It was also a very affirmative and encouraging discovery that the students value the traditional on-campus educational system despite having a wide range of ICT resources at their fingertips.

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