

Analyzing the Role of an Online System in Reducing Learner's Transactional Time in an Open and Distance e-Learning (ODEL) Environment: A Landscape Connectivity Perspective

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Abstract

Geographical distance between the learners and the institution characterizes distance education (DE) mode of learning. Transactional time increases with distance. The rapid advances in Internet technology help reduce transactional time by allowing the development of online systems. Online systems such as the online request for document system, or ORDS helps facilitate students' requests for and receipts of their academic records. However, there is a paucity of information on how such systems facilitate students' requests and how students respond to the availability of such online systems. This information is vital in developing student support for DE learners because they are faced with multi-tasks, and time is an important element for their success. Using the landscape connectivity theory, this study was conceptualized to (a) evaluate whether ORDS reduces the transactional time of students in requesting and receiving documents, and (b) analyze students' satisfaction level of using the system in terms of three usability criteria, namely, usefulness, ease of use, and efficiency. Data were collected through an online survey and retrieval of artifacts such as logbooks, emails, and reports. Results indicate that transactional time has been reduced from 12 days with a manual request system to 3.35 days with the online system. All criteria of usability received a satisfactory to very satisfactory evaluation from respondents with usefulness receiving the highest score among the three criteria. Results implied that online systems could enhance student connectivity with DE-providing institutions. Enhanced connectivity allows greater access to the institutions' resources and services that could support students' learning and persistence.

Keywords: *distance education, e-learning, online systems, landscape connectivity, transactional time, Internet*

Introduction

The geographical distance between learners and their institutions characterizes distance education. Several studies (e.g. Beldarrain, 2006; Zhang & Kenny, 2010) reported that geographic distance has expanded from adjacent towns to cities to remote countries and continents. The physical isolation is critical for students' success in distance education. Croft, Dalton, and Grant (2010) reported that physical isolation is one of the barriers and challenges in distance education and has been observed as one factor that de-motivates learners. Demotivation may result from having a feeling of isolation from their mentors, other learners, and institution (Kok & Frown, n.d), and may result in student's decision to drop out of their program.

High dropout rates have a negative impact on the economics of the university (Angelino, Williams, & Natvig, 2007). Moody (2004, p. 205) in Angelino, Williams, and Natvig (2007) emphasized that the costs for development, delivery, and assessment as well as lost tuition revenue due to high attrition rates, result in wasted expenditures for the institution."

In addition, high rates of student drop out are viewed as education quality issues. According to Angelino, Williams, and Natvig (2007), DE institutions with a high rate of drop out or attrition are perceived to have a quality problem.

Therefore, determining what services and delivery methods the institutions will need to provide to ensure successful completion of students in their program is critical (Nash, 2005 in Angelino, Williams, & Natvig, 2007).

Several institutions develop and establish online systems to mitigate the impacts of geographical separation on students' decision to stop studying. Other universities such as the University of the Philippines Open University (UPOU) in the Philippines have shifted to a purely online course delivery model to maximize the rapid advances in information and communication technologies such as the web in addressing the physical isolation. Aside from establishing an online learning management system, UPOU has also embarked on putting all its academic processes including enrollment, admission, and request for documents (e.g. student's transcript of records, a true copy of grades, certificate of completion, etc.) on the cloud.

In 2013, the Office of the University Registrar (OUR) of UPOU developed the Online Request for Document System (ORDS). ORDS which is lodged in the Online Student Portal (OSP) is one of the student support services being offered by OUR to UPOU students living within and outside the Philippines. Its primary aim is to reduce the students' time in transacting with the University. Its development is founded on the idea that online learners are individuals with multi-tasks such as occupational, family, and social commitments where time is of primary consideration when they transact with the University (Hanson, et al., 1997 in Dabbagh, 2007). The system is made available 24/7 to students to provide greater accessibility, flexibility, and convenience in terms of time and cost. As Bataineh (2001) in Fuller and McBride (2001) has indicated, online systems provide students cost-saving in forms of evaded transportation cost and lost income when students leave from their work to be able to file their requests for documents in the university.

Though several studies (e.g. Saroiu, et al. 2002; Hill, 2012) were conducted on how online content delivery mode influences learners' learning process, there is a paucity of information on whether online systems have actually reduced students' transactional time. In addition, there seems to be a lack of information on students' responses to the availability of these systems for their use. This information is vital in improving online systems to maximize their utility as a tool for student support.

Objectives

In general, the study was conducted to (a) determine whether the transactional time of students is reduced with ORDS; and (b) analyze the students' level of satisfaction in using the system.

Specifically, the study was conducted to (a) profile students who used ORDS; (b) compare the transactional time and the number of requests being served and completed between the manual system of requesting academic documents and ORDS; (c) determine the students' response using the three usability criteria (i.e. usefulness, ease of use, and efficiency); (d) analyze gender-sensitive implications of system's utility, and (e) provide recommendations for system improvement and future research directions.

Conceptual Framework

The study was guided by the assumptions and concepts of landscape connectivity. Landscape connectivity deals mainly with the interactions between the organisms and landscape property. Living organisms exhibit specific movement in certain landscape. Crist et al. (1992) cited several studies that indicate a relationship between animal movement patterns and some ecological functions such as foraging (Smith, 1974; Bond, 1980; Pyke, 1984); space use in home ranges (Siniff and Jessen, 1969; Swihart, Slade, and Bergstrom, 1988); population distribution over space (Levin, 1974); dispersion (Okubo, 1980; Stamps, Buechner, and Krishnan, 1987); and interactions (Murdie and Hassell, 1973; Banks, Kareiva, and Murphy, 1987). Animal movement is directed by certain factors such as availability of food, vegetation, social factors, or changes in habitat landscapes (Crist et al., 1992). The differences in physiology, vagility, size, and life history characteristics have also been observed to influence movement patterns (Greenwood and Swingland, 1984; Loehle, 1990; Turchin, 1991 in Crist et al., 1992). These factors are important in their survival, physiology, and reproduction.

The main point of landscape connectivity is the ability of the landscape to provide mobility to organisms to evade predation, seek for food, and/or reduced edge effect, all of which could significantly affect their survival and reproduction in the landscape. Highly connected landscape allows ease of flow of materials and/or movement of organisms. On the other hand, fragmented or patchy landscape can cause difficulty of movement and therefore reduces connectivity of organisms to other sources of food or spaces for their physiologic processes (Taylor, Fahrig & With, 2006). The difficulty arises when their habitats become highly separated and disconnected. Consequently, organisms would have trouble accessing the various resources for their survival and existence. Landscape managers should establish ecological corridors to link these highly fragmented habitats if they wish to enhance these organisms' survival.

Such condition does exist in a distance education environment where all elements are highly separated both in structure and function. Considering distance education environment as a highly fragmented landscape, learners are physically and functionally separated from their learning institution, which provide services that could help them persist in their programs. This separation makes it difficult for them to connect with the institution and access its different resources and student support services. If unmanaged, such separation could lead to isolation, which is a major barrier of learners' success in distance education (Akuamoah-Boateng & Boadu, 2013).

By virtue of the nature of DE learners (e.g. working, multi-tasked, separated physically), their navigational behavior in a virtual landscape can be construed as a movement directed towards achieving certain goals. Though there is a significant difference between students in a virtual environment and organisms in the real environment, they have a common goal, i.e. to be successful in their transactions given a set of environmental conditions. To do this, both organisms and e-learners should devise strategies that can help them achieve this goal. However, the landscape (for the case of the real organisms) or the institution (for e-learners) should provide the facility for the successful transaction. In any condition, time is an important element for both organisms and e-learners. For e-learners, it is crucial since they are faced with multi-tasks that they need to accomplish (Dabbagh, 2007).

Using landscape connectivity as a framework of analysis, the study evaluated how ORDS serves as a system that reduces the disconnect between students and a DE-providing institution in

the Philippines. It is assumed that the reduced transaction time, i.e. the time spent between requesting a document and receiving it, reflects increased connectivity between the learners and the institution. The study assumes that ORDS, being an online system, offers a ubiquitous pathway that connects the learners and the institution so that the former can easily access the services and resources of the latter. The evaluation of such system, however, should emanate from the users themselves, in this case, the learners. But given the diversity of perspectives, experiences, and prior knowledge of e-learners, the study assumes that there might be user-sensitive and user-specific behavior and implications of the evaluation. They should be analyzed and carefully considered in the improvement and implementation of the system.

Methodology

Study Site and the Online System

The study was conducted in the University of the Philippines Open University (UPOU). UPOU is the fifth constituent university of the University of the Philippines System. Established on 23 February 1995, it is mandated to provide wider access to quality higher education. UPOU offers one pre-baccalaureate program, two baccalaureate programs, ten post-baccalaureate diploma programs, 13 master's program, two doctoral program, and ten non-formal courses by distance education. During the first term of the Academic Year 2013-2014, UPOU has a total enrollment of 2,890. Most of the students are enrolled in the graduate programs (74%) while the rest are enrolled in undergraduate (17%) and certification programs (8%). Geographically, about 20% of the enrolled students are based outside the country while 34% is residing in Metro Manila. The remaining 46% is living in the different provinces of the country.

In recent years, UPOU functions under the ODeL framework of distance education where most of its academic and administrative processes and services are done through the Internet. In support of this thrust, the Office of the University Registrar conceptualized and later developed an online Academic Information Management System (AIMS), which serves as a one-stop site for the needs of all the University's constituents. AIMS consists of five portals (Figure 1), each of which serves different users. Among these portals, the Online Student Portal (OSP) is the AIMS component that serves the students. OSP was rolled out in 2012 and has undergone several revisions to allow more self-service transactions. It is designed to become a one-stop-shop online system that provides customized services to the students.

The online request for documents systems (ORDS) is part of the student portal component of AIMS (Figure 2). As a learner support system, ORDS enables the students to request documents such as transcript of records, certificates, true copy of grades, and the like regardless of their geographic location and time zone. Students just need to have a strong Internet connection to be able to use the system. Processing of the requests, however, is dependent on the type of document requested and availability of the needed information. Likewise, responses to requests depend on the kind of document requested. Original and official copy of transcript of records would be sent through a courier though the request is done through ORDS.

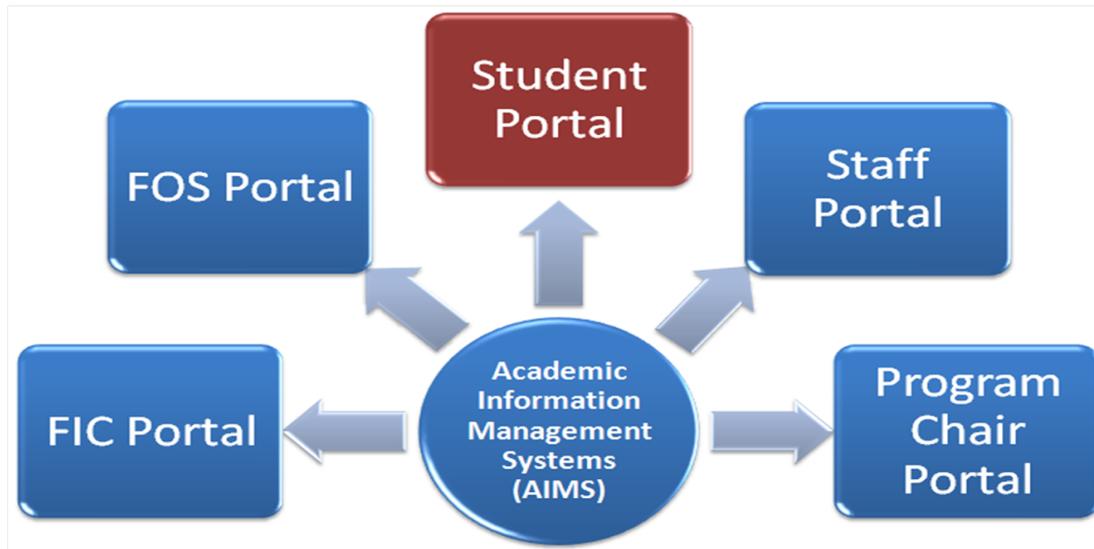


Figure 1. Academic Information Management System Structure

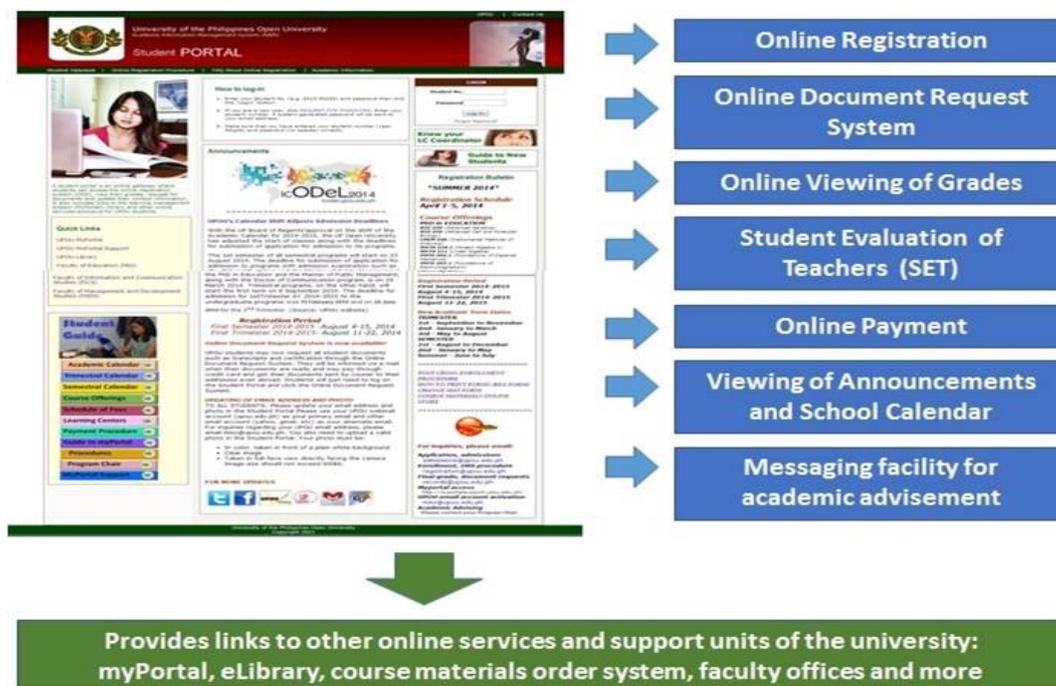


Figure 2. Support services in the UPOU Online Student Portal

Data Collection

An online survey was conducted from January 28, 2016, to July 2, 2016, involving the continuing undergraduate and graduate students (n = 190) who experienced both the manual and ORDS. The survey collected information on students' satisfaction on ORDS based on the following criteria: usefulness, efficiency, and ease of use. It also collected information on the student's profile, the frequency of use, personal views, and suggestions for improvement of the system. A Likert-scale

instrument with a 5-item scale (i.e. 5 is highest while 1 is lowest) was used. It consists of 14 items distributed as follows: eight questions about the learner's profile, there were three items that required the learners to rate their satisfaction on the use of the system, and there were three items about their personal views and suggestions for the future improvement of the system.

An invitation and link to the online survey were sent to the students through an email. An announcement about the ongoing survey was also posted on the student portal. The survey was purposive and was intended to students who experienced both online and manual request systems were considered as the population. Consent of the respondents was integrated into the online survey and served as the first page of the instrument. It had a "yes/no" button to which the respondent indicated his or her participation in the survey. To maintain the confidentiality of responses, results were reported as aggregate values.

Computation of the Transaction Time

The reduction in transaction time between the manual and online systems required retrieval of data in logbooks and database of the online system. Transaction time was computed as the number of days consumed in waiting the requested document. The computed transaction time was compared between the manual and online request for documents system. The reduction of the transaction time was computed as the difference between the transaction time of the manual and the transaction time of the online system.

Under the manual system, the transaction time includes the number of days consumed in transmitting the application form from the student to the learning center or courier and from the learning center or courier to OUR, processing of the requested documents, and transmitting of the requested documents from the OUR to the student. Under the manual system, students would fill out a request form and sends it to OUR either through their learning center or a courier. The person-in-charge at the OUR processes the request upon receipt of the form. S/he releases the requested documents to the student upon receipt of his/her proof of payment for the processing fees.

In addition, the number of requests served and completed per document type was also determined and compared for both systems.

The process is different under the online system. Transaction time in an online system includes the time of sending the request via the system and the time the student received the requested document.

Data Analysis

Data were analyzed quantitatively and qualitatively. Quantitative analysis included computation for descriptive statistics, e.g. difference, means, and percentages. Meanwhile, important learners' remarks on the usefulness, efficiency, and ease of use of the system were considered in the qualitative analysis.

Results and Discussions

Respondents' Profile

Most of the respondents of the study were Filipinos (n = 188) living in the Philippines (n = 159); females (n = 127), and were in the working-age, i.e. 21-60 years old (n = 186) (Table 1). McLean and Morrison (2000) observed a similar distribution of respondents in their study on socio-demographic characteristics of learners and participation in computer conferencing.

Table 1. Distribution of respondents by socio-demographic variables (n = 190)

Socio-demographic Variables	Frequency	Percentage
Gender		
Male	63	33.16%
Female	127	66.84%
Age		
Below 20	3	1.58%
21-30	68	35.79%
31-40	78	41.05%
41-50	36	18.95%
51-60	4	2.11%
Above 60	1	0.53%
Nationality		
Filipino	188	98.95%
Not indicated	1	0.53%
Pakistan	1	0.53%
Current Residence/ Work Location		
Philippine-based	159	83.68%
Offshore based (abroad)	31	16.32%

Transaction Time: Manual System vs. Online System

On average, the transaction time under the manual system was computed to be 14 days. This is significantly reduced to 4 days under the online system, i.e. ORDS. The reduction could be due to the reduced number of days consumed in transmitting the request form and releasing the documents to the students. Under the online system, the request is directly transmitted to the Office of the University Registrar (OUR), and therefore, the OUR could immediately process the request. Unlike in the manual system, the request will still go through several channels before it can reach the OUR. In addition, since the system automatically computes for the processing fees, learners would no longer wait for an email from the person-in-charge in OUR informing them of how much they should pay for the requested document. They have also an option to pay online, which does not exist under the manual system. Under the latter, learners must queue in a bank to pay the fees before their request could be processed.

Learners could use the saved time in learning. With multiple tasks on hand, a DE learner needs to manage their time in learning. Thorpe (2006) has mentioned that time management is necessary for being successful in DE. Although DE has reduced the time barriers against learning as learners can now study at their own pace, it has moved time management issues back to learners (Thorpe, 2006). Therefore, reducing the time spent on non-academic processes in the university will really help learners cope with their time-demanding tasks.

In addition, the result indicates that ORDS was able to reduce the functional gap between the learners and the institution. The system appeared to address some of the learners' concerns related to requesting a document. For instance, learners indicated that ORDS has addressed the issues of cost of time, risk, and transportation cost associated with requesting a single document. These are indicated in the following responses:

“I need not travel for 16 hours (going & back) with all the attached risks and expenses just to request for the document.” [Student 1]

“Your system is very friendly to us offshore who have limited resources and manpower to help us run errands in the Philippines.” [Student 2]

As reflected in these responses, distantly located learners such as overseas students can now request a document through the ORDS without incurring additional costs. Though Fahrig (2003) had indicated a greater dispersal cost in a highly fragmented landscape, ORDS allowed learners to save their resources as they need not travel long distances to connect with the University and request a document.

Number of Requests Served and Completed: Manual System vs. Online System

More requests for student records were being served and completed through the online system than the manual system. The computation of the mean number of requests for the online system indicated a 15% increase within three years. On the other hand, the Office of the University Registrar (OUR) was able to process a monthly average of 149 requests; this is 36% higher than the number of requests processed through the manual system.

The online platform has provided students a convenient way of requesting a document. Such convenience has encouraged more students to transact with the University for their needed documents. The online system allowed the University to provide a timely response to their requests. As Oxera (2015) had indicated, online systems provide greater convenience to users while allowing institutions to provide efficient services to customers. This is reflected in the following responses of students:

“Ang galing! I requested my transcript by email. The response was very timely, courteous, and relevant.” [Student 3]

“Faster processing; Am very pleased with the ORDS. Keep it up!!” [Student 4]

The greater number of requests being processed and served through the online system indicated a greater connection between the students and the University. Specifically, the online system allowed students to do efficiently their non-academic activities in the University despite the

physical separation. While structural connectivity is instrumental in maintaining biodiversity in a natural landscape (Gelling, Macdonald, & Mathew, 2007), ORDS appears to be important in maintaining University's connection even with its former students as indicated in the following remarks:

“I really appreciate the kind of online service UPOU implemented. Former students like me found that we are still given importance. Thank you very much.” [Former Student 1]

ORDS Usability

Figure 3 summarized the computed mean scores of all usability criteria investigated in the study. Generally, students have found ORDS to be useful, efficient, and easy to use. As shown in Figure 3, all the items received a computed mean score of greater than four, indicating students' favorable evaluation of the system. As implied in the students' remarks mentioned above, ORDS has become significantly useful for geographically distant students, e.g. the students in offshore who lack resources and those with limited manpower to process their requests via the manual system. It has allowed them to process their request efficiently and timely.

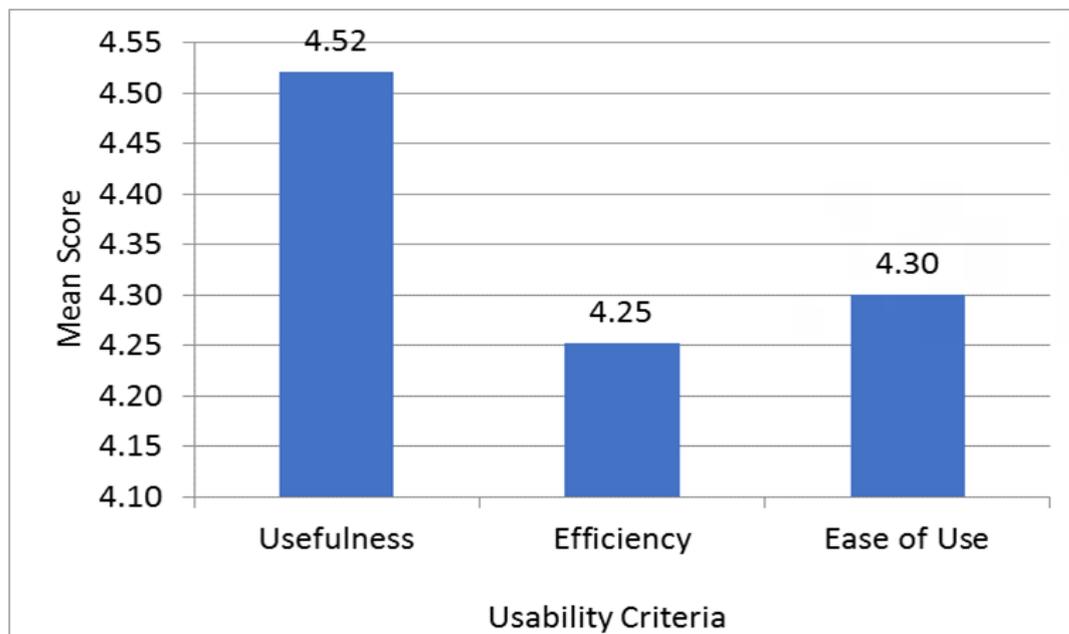


Figure 3. Mean scores of the usability criteria used in evaluating ORDS (where 1 is the lowest score, and 5 is the highest score; n = 190)

The students' favorable evaluation of the ORDS could be attributed to the time and cost savings they experienced in using the system for requesting a document. As in highly connected landscapes where organisms save energy and resources in food-seeking activities (Baguette et al., 2012), students through the ORDS were able to save their time and money, and thereby, minimizing the additional cost of their education (Nguyen, 2015). As [Student 1] has indicated, the system had saved him from spending about 16 hours of travel and the expenses associated with it. These savings are significant for students who are personally paying their education. The evaded costs of transactions could enhance their financial capability for their next term enrollment just as the energy saved by organisms in a real highly connected landscape can be used to strengthen their feeding and reproductive capacities (Tischendorf & Fahrig, 2000).

Also, students found the system to be more efficient and convenient than the manual system, as indicated in the following comments:

“Very convenient! Ang efficient! Impressive! Kudos sa inyong lahat!” [Student 5]

“Faster processing; Am very pleased with the ORDS. Keep it up!!” [Student 4]

“I never had a hard time requesting the documents. I was able to receive the documents on time, thus the current system is sufficient and efficient enough.” [Student 6]

These findings indicate that ORDS could be an important channel that supports students in their non-academic activities in the University despite the distance. Being highly fragmented, DE landscape requires a virtual channel that enhances students’ connectivity with the University. While Williams and Snyder (2005) emphasized the importance of corridors in reversing the impacts of fragmentation on organisms’ movement, students’ remarks highlight the role of ORDS in reducing the functional gaps created by the physical separation of students from the University. It is recommended that the University should develop further this system to cater to more needs of the students.

Future Improvements

There are still some students’ needs that are not served by the online system. According to Raita and Oulasvirta (2011), these unmet needs could have affected students’ evaluation of the system. As revealed by students’ responses in the survey, these needs include: (a) a payment option for debit card; (b) records of payment; (c) express online request; and (d) real-time interaction. These needs are revealed in the following responses of students in the survey:

“Please add other ways in paying the requested documents. If it is possible, we can pay through electronic debit cards not just credit card alone. Also, it is very impractical to pay 20.00 pesos to a PNB branch which always has a long line.” [Student 7]

“An Express Document Processing and Delivery feature may be added (1-2 days). This will be beneficial for those who really need their documents as soon as possible.” [Student 8]

“Real-time inquiry such as live chat queuing facilities would speed up transaction. Paypal, debit card and the like shall also be included in the payment facilities to accommodate those students who don’t have credit cards.” [Student 9]

“May I also suggest that when official receipts have been submitted, it must also appear there as accessible. Though there is a sign that it was submitted when I click “submit”, it could have been better if I could see it.” [Student 10]

The list indicates the diverse needs and interests of students, which could possibly be addressed with the future improvement of the system. If these improvements will be done, the system could further enhance the functional connectivity of students with the University that is impeded with their physical separation. The remarks also revealed students’ desired high connectivity with the University to avoid the hassles of the manual processes and to have immediate access to information (Baker, et al., 2016). As [Student 7] and [Student 9] had emphasized, they don’t want

to experience the hassle of queueing in a bank just to pay a fee of PHP20. In addition, adding a real-time inquiry functionality to the system could address the socio-emotional as well as information immediacy needs of the students. According to Baker et al. (2016), these needs are typical for a self-paced learning environment. The real-time interactions could foster a sense of connectivity among the students, and in the process, could improve their sense of community. In fact, Rovai (2002) reported that as the interactions become more personal such sense of community becomes stronger and the isolation effect becomes lesser and lesser.

Conclusions and Recommendations

However, future improvements of the system should be done to address the diverse needs of the students. As meeting these needs enhances their sense of community, it is recommended that the role of ORDS in motivating students' persistence should be investigated. Motivation is an important factor in students' performance, persistence, and engagement in an online education. A study that answers questions on how and why non-academic online systems such as ORDS have motivated students could provide important information necessary for the development of a strong student support system for online learning.

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