



Autonomous Learning in “Principles and Theoretical Perspectives of Online Economics

Leoncio P. Olobia

E-mail: leoncio.olobia@lnu.edu.ph

KeyWords

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ABSTRACT

Principles and Theoretical Perspectives in Economics is a three-unit subject delivered fully online to selected Leyte Normal University (LNU) undergraduate students under the Social Science Unit. The course draws on principles of autonomous learning in an Information Communication Technology (ICT)-supported platform and the project involved the development of an online course in economics using Information, Communication Technology (ICT) and human interactivity in achieving autonomous learning.

The aims of the project were (1) to develop an online course, Principles and Theoretical Perspectives in Online Economics, as an alternative learning platform for undergraduate students of Leyte Normal University (2) to utilize Information, Communication Technology (ICT) and human interactivity in achieving autonomous learning (3) to evaluate the course based on its learning autonomous learning design principles.

Results of the study revealed that students learned autonomously through independent, learner-centered and knowledge-centered approach by employing constructivist and cognitive strategies with a high degree of learning control. Next, technological affordance was construed as support to knowledge construction in a learner-centered environment where the importance of student-student, teacher-student interactions illustrating ‘pedagogy of nearness’ as a learning continuum proved vital in the learning process.

CONTEXT

Campus-based introductory economics is offered to undergraduate students under the Social Sciences Unit of Leyte Normal University. It orients students with various economic models and perspectives of Economics including Taxation and Cooperatives which result in learning inefficiency due to the integration of three broad topics in one semester. As such, the need for a separate, purely economics subject is deemed vital for a deeper understanding of the subject matter and to prepare students for higher economics.

According to the Leyte Normal University president, the need to implement distance education in general, online learning in particular, in the university was in accordance with ASEAN integration’s pronouncement to promote competition among member nations through globalized education. Keeping pace with the integration process articulated knowledge as the main ingredient in fostering competitiveness among LNU graduates. Also, borderless education would serve a greater need to incorporate multicultural learners where different beliefs, views and principles came together in a highly engaging online platform.

From the point of view of instruction, the president articulated the importance of embracing new ways of delivering learning that would be student-oriented, more sensitive to their needs, capitalizing on ICT.

In an effort to make it a reality, LNU was visited by peace corps organization in October 2016 where its team leader interviewed the president on the needs of the university. In the meeting, LNU president articulated plans to come up with an Open University at LNU including an approved six-month training program launched at LNU in November of 2016 attended by experts in distance education.

PROBLEMS ADDRESSED BY THE PROJECT

The project addressed the following study questions:

- How did the students learn in the course, Principles and Theoretical Perspectives in Online Economics using autonomous learning principles?
- What were the roles of Information Communication Technology (ICT) and human interactivity in the online course?

PROJECT OBJECTIVES

The project aimed to:

- Develop an online course, Principles and Theoretical Perspectives in Online Economics, as an alternative learning platform for undergraduate students of Leyte Normal University.
- Utilize Information, Communication Technology (ICT) and human interactivity in achieving autonomous learning.
- Evaluate the course based on its learning autonomous learning design principles.

REVIEW OF RELATED LITERATURE

In a study conducted by Lim Cher Ping (2003), learner autonomy was articulated in an introductory course in economics with the use of ICT through learner control and learners working at their own pace (Ping, 2003). Moreover, the paper expounded on the necessity of independent thinking as introductory economics presents concepts, models and theories which the students would use to solve real-world problems honing their cognitive skills.

Based on the study, reflective thinking is inevitable in this self-directed learning approach. This statement explains that ITC in itself is not the reason for cognitive functions to operate but it rather aids and presents impetus for deep and meaningful learning. After all, it is the learner's sense of valued learning that makes sense. This is underpinned by the philosophy of *uses determinism* (Dahlberge, 2004) which pertains to the instrumental uses of technological artefacts, and, correspondingly, their effect on society. Technology is a tool, a medium for enhanced learning, perceived as neutral and putting them in learning context will serve its purpose in a way conducive to its users.

As an offshoot of autonomy, the paper discussed cognitive scaffoldings embedded in ICT tutorial packages such as multimedia presentations where students were initially presented with rules on the screen, list of steps and procedures, inserted questions for diagrams, and so on. However, Ping (2003) asserted that the success of learning is not dependent on ICT scaffolds but should also include human interaction to enhance the learning process until scaffolding fades its use. This contends continuity of ICT and non-ICT support where the latter indicates facilitative interaction between teacher and students or among peer learners both critical for meaningful learning. Having said, it is of utmost importance that a technologically enhanced learning should not be too reliant on the affordances of technology per se but rather to embrace learning autonomy that encompasses interaction and collaboration between learners and with the teacher in confluence with technological use.

Contrasting statements were also presented in the same study regarding learning autonomy with the use of ICT. Three issues were discussed: lack of learning strategies, lack of knowledge and lack of motivation. The use of ICT as a learning tool overwhelmed the students with procedures embedded in the package rather than content that lead to cognitive overloading.

According to Jih and Reeves (1992), students using an ICT package have to cope with three types of cognitive load in the ICT environment: the content of the information, the structure of the package and the response strategies available. In other words, learning diversion becomes a menace to the learning process. Second, students who lack knowledge in the ICT package will be challenged or overburdened by the demands of the technology, doing so may switch attention to the ICT package that really is not substantial to content learning. Third, if the ICT is not integrated in the curriculum or explicitly explained, students end up losing interest not just of the technological part but somehow the entire motivation to learn is reduced.

Cognitive and Constructivist Learning

The aforementioned study is drawn heavily from cognitive and constructivist views of learning as seen in problem-solving, analytical discussions requiring both graphical representations and graphical analysis in the various lessons. Soper (1997) claimed that insertion of questions throughout the tutorial mode in WinEcon encouraged student's critical reflection and promoted learner autonomy. (WinEcon is an interactive ICT used in online learning in principles in economics and other areas of the discipline). Rothkopf (1970) hypothesized that inserted questions give rise to 'inspective behaviours' which 'give birth to learning'. As these inserted questions encourage students to process the content of the instruction more thoroughly, students apply it in a new situation (Watts & Anderson,

1971).

Another view on constructivist learning is drawn from Woldab (2013) who asserted that learning economics is not just by transmitting knowledge as in a lecture, but rather learning is based on previous knowledge, hence, some association should be created between prior knowledge of students with the current lesson emphasizing that an economics teacher should engage students by brainstorming and relating their prior knowledge and making them synthesize new information. Fosnot (1996) described 6 strategies of constructivism that Woldab (2013) believed should be employed in an online class in economics, as such: introduction, exploration, experiential mode, abstract conceptualization and understanding, reflection, application and evaluation. In the conduct of constructivist strategy, the role of the teacher should not be dismissed altogether but rather he or she should instruct students to construct knowledge (Woldab, 2013).

Finally, learner autonomy that is based on constructivist learning theory was explained by Wong, (2014) who asserted that with constructivism learning theory as theoretical support, learner autonomy advocates learner-oriented study, emphasizing learner's role of cognitive subject. Knowledge is not passed on by the teacher but learners' acquiring through meaningful construction with the help of necessary learning materials and others (including teachers and study partners) under certain situation (Wong, 2014).

Some of the ways to cultivate learner autonomy under the guidance of constructivism included cultivating learning motivation and setting learning objectives, from knowledge accumulation to meaning construction, emphasizing cooperation among learners, the combination of formative and summative evaluation, making use of multimedia technology (Wong, 2014).

Autonomous learning with ITC support was discussed in another study of students in EC103 (Introductory Economics) through the use of MathEcon/WinEcon ICT tool using mathematical worksheets, interactive animations where students studied at their own pace said learning tool (Ping & Lim, 2001). The study revealed that 97% of the students reported that MathEcon allowed them to work at their own pace, and 98% agreed or strongly agreed that MathEcon was easy to use and navigate (Ping & Lim, 2001). As a learning tool, MathEcon empowered students by giving them control over sequence and pace in which the materials were presented. It also provided visualization, animation, immediate feedback, and cognitive scaffolding in its design (Ping & Lim, 2001).

Some of the independent actions of students in the study included taking down notes from the computer worksheets embedded in MathEcon allowing the students to construct their own meaning based on the ICT package. Notes jotted by students allowed for content consultation as they would normally function in classroom learning. Further on, learner control was expressed through self-directed control of speed of multimedia presentations answering on heterogeneity of learning abilities of students in EC103. In this autonomous setting, students were also provided with non-ITC support from the teacher that provided tutoring, facilitating and guiding students in their learning progress on an individual basis. The importance of the study lied on its autonomous nature aided by ICT and non-ITC support in fostering optimal learning.

Roles of ICT

Information Communication Technology (ICT) has paramount roles in online learning as underpinned by *uses determinism* and TCPK model previously mentioned. In this this section, empirical data are drawn to explore on its practical applications using ICT that is internet-based although ICT includes CD-ROMS and other non-internet based tools as well.

A study on promoting active-student learning using the World Wide Web in economics courses (Simkins, 1999) discussed the importance of the Web technology in promoting active online learning. In the journal, the discussion highlighted on the Web as a rich resource of economic news, data and information that can make economics relevant and understandable for students; The Web also makes possible new learning environments that give students with different learning styles, additional entry points into economics and multiple ways to practice economic concepts; the Web provides new opportunities for collaborative learning (Simkins, 1999). Becker (1997) listed "the need for active student involvement with classmates in the learning process", as one of the key elements in increasing students' performance and interest in further study of a subject. The Web is a natural tool for increasing student-student as well as student-instruction interaction through the use of online chat, discussion boards (Simkins, 1999). Furthermore, students using Web resources are able to practice on economic concepts, the journal expounds, through simulations, joining stock market as application of knowledge.

The important contributions of the Web on learning cannot be met without some criticisms of its use. Simkins (1999) asserted that empirical evidence of Web-based instruction for student learning in college courses is slim. Russell (1997) contended that in over 250 research reports submitted, research on the use of technology in teaching suggested that there is 'no significant difference' in the learning outcomes of students who use technology and those taught in classroom. Yet another study by Conrad (1997) that provided a survey of research evaluating the use of Web-assisted instruction (email, discussion boards, simulations, and tutorials) generally increased students' enjoyment of classes but found no solid evidence of improvement in student performance when compared with students taught using traditional methods.

The use of online economics textbook, another example of an ICT-based learning has been discussed in a research conducted by Miller (2010) which, among other things, articulated that the lack of comfort reading from the computer has slowed down the acceptance

of electronic textbooks (Carlson, 2005; Nelson, 2008). Eye strain from computer screen and back and neck problems were a concern (Crawford, 2006).

Even with all the aforementioned restrictions of Web-based learning, still it cannot be denied that resurgence of ICT-based learning where the internet and the Web play critical roles has spiralled online learning. Learning will be enhanced when instructors incorporate and blend technology into their teaching pedagogy in ways that help students practice economic concepts and get them actively involved in the learning process (Simkins, 1999). The World Wide Web is an extremely multifaceted technology that provides a large and seemingly ever-growing set of communication and information management tools which can be harnessed for education provision (Anderson, 2008). Moreover, the Net affords interaction in many modalities (Anderson, 2008). Oliver (n.d.) mentions that ICT-based learning delivers issues such as expanding the pool of teachers – to include trainers, mentors, specialists apart from the traditional teachers in classroom, expanding the pool of students – more students are now accommodated with the flexibility provided for in ICT-based learning, cost of education – a rather ticklish issue that takes its toll on expensive technology-based education that deals with infrastructure, course development and course delivery (Oliver, n.d.).

CONCEPTUAL FRAMEWORK

The major theme in this online course is autonomous learning. These two pedagogical approaches are facilitated by ICT (see Figure 1). As shown in the framework, the importance of autonomous learning as depicted in student's learner-content interaction is done exhaustively with ITC-based resources found in the internet. Such independence expressed in self-directed learning is especially applicable given the geographical distance between the teacher and the students. Wedemeyer's Theory of Independent Study is significant in online learning as articulated in his view that students should be independent learners and should maximize technological affordance for optimal result. However, autonomous learning does not dismiss the role of the teacher because he or she provides guidance to students, assesses their learning, among other duties. Further, learner-content interaction as an element of autonomy highlights a "teacher's voice" emanating from students reading various content available at their disposal.

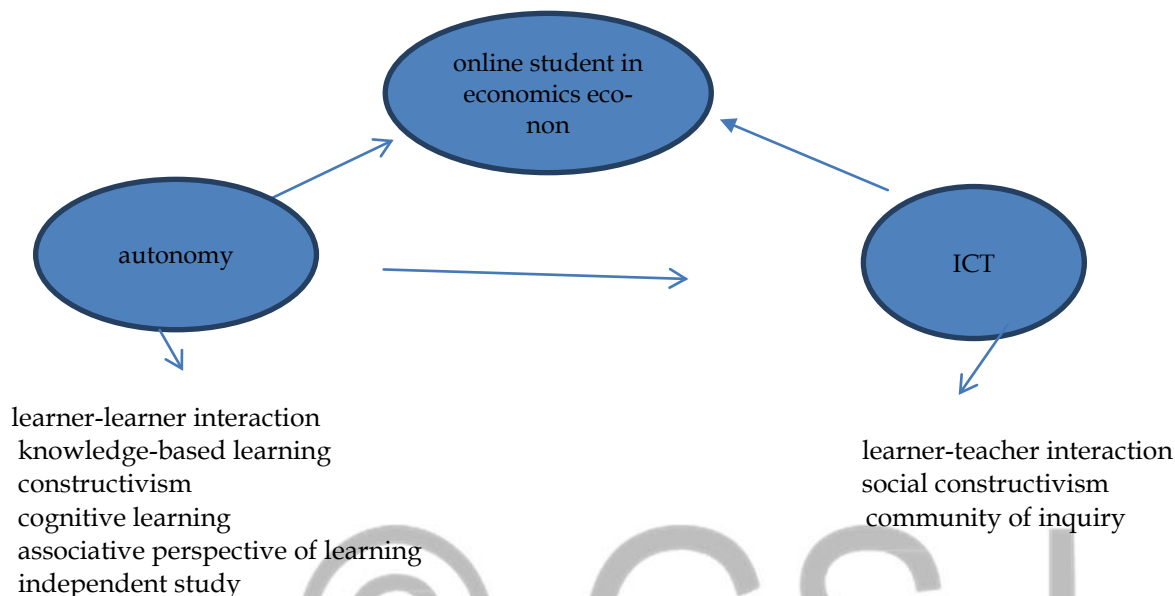
Corollary to a learner-content interaction in autonomous setting is a knowledge-centered learning as explained in Anderson's Theory of Online Learning that deeply enhances memory, critical thinking, reflection. This underpinning astounds students in online economics because of its orientation as an introductory course, students are confronted with various concepts, models and theories necessary for understanding. The affordance of internet encourages knowledge and information exploration where learners choose a wide array of resources available at their disposal. Having said, learner autonomy focuses students on the complexities of resources allowing them to control the amount of information loaded into their memory due to its self-directed nature.

Next, autonomy enables students to construct meanings by integrating their experience into the learning process, employing critical thinking skills through analysis, application, synthesis of information – all of which is done by students in principles in economics accompanied by ITC support that enhances cognitive functions. For example, interactive multimedia presentations in ITC allow learners to manipulate graphical illustrations, real-world problems constitute application of theories into real practice for meaningful learning.

In addition, problem-based learning, a constructivist learning approach applied in some learning units reverses the process by way of putting the students in real-world problems to develop practical and relevant solutions so that theories and models are developed thereafter as a result of experiential learning. Its relevance is explained by the nature of PBL that a sense of puzzlement triggers learning process.

Having said, autonomous learning was a key in the study of online economics mediated by Information Communication Technology that aided in the fulfilment of learning desires. Though it cannot be overemphasized that the two were made possible due to the use of technological support, non-ITC support (human interaction), as evident in learner-learner, teacher-learner communication ensured continuity of learning.

Figure 1: Model of Online Learning



METHODOLOGY

This project was divided into three phases discussed subsequently.

First Phase

In this initial stage, learning conditions of campus-based students in Introductory Economics at LNU were explored and problems were pointed determining the need for online learning. Two questions were asked: what were the learning conditions of the classroom economics you were enrolled at, was online learning good for you as a student? Next, teachers were interviewed as to their level of comfort and readiness in online teaching such as technological skills and geographical distance with learners, among others. Finally, the university president was interviewed in order to gather insights on distance learning from an institutional perspective.

Second Phase

Primarily, the project was deemed necessary to develop a subject, Principles and Theoretical Perspectives in Online Economics to be delivered fully online for LNU undergraduate students required to take the subject. As such, the course was developed by the author using www.moodlecloud.com, a free Moodle site, as its platform. The online subject included author-developed modules that included learning activities, unit topics with discussions of important concepts, theories, graphical and mathematic analyses embedded with learning activities such as reflective exercise, real-world problems and links for further study designed to enhance independent study. The aforementioned design, drawn from principles of autonomous learning was developed by the author with full knowledge that said learning subject would satisfy research questions.

Third Phase

During this stage, pilot implementation was done to target learners. Among the activities were enrollment of students, uploading of course content and beginning of learning activities.

The class commenced on December 4, 2016. All learning activities commenced during this date. At the end of the pilot testing, student

evaluation was done by filling out an online questionnaire that focused on independent and collaborative learning. After which, quantitative and qualitative analyses were drawn based on the questionnaire results and narratives of students. Quantitative analysis was based on a 5-point Likert scale (1- strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree) where the author used descriptive analysis such as mean score and percentages. Qualitative analysis was based on student posts at the course site, course design and literature.

ETHICAL CONSIDERATIONS

As this project involved students as main participants, and faculty and the university president as secondary participants whose roles were mainly to provide insights on the need for online learning, it was imperative that the author followed ethical procedures in the pursuit of all activities related to the project.

Written consent was handed to each student stating explicitly that enrolling in the online course was strictly voluntary. This issue on informed consent was perceived to present some difficulty in participant's understanding of the research process as it basically raised the question: what do I get from the project? Needless to say, full disclosure on purpose of the project was a priority including information gathered from the participants to be strictly used for this project only.

Power Relations

The next ethical issue was defining power relations between the project author who possessed knowledge power over the participants that needed to be empowered. This empowerment of undergraduate students basically explained that their voluntary act was an entitlement of their own learning agenda that would transcend from classroom-based learning as indicated in the beginning of this paper. Yet again, there was something that students had to realize on their own without being pressured from the teacher, the institution, and the project developer of any sort. This meant that students exercised power and freedom to participate in the course activities. On the other hand, the author had to make sure that power was intended for the benefit of the entire project including the participants' welfare and protection of their rights. Contextualizing power relations for this project, furthermore, implied that participants were intellectually 'safe', harnessed to its full potential and not meant to harm them.

Issues on Questionnaire

It was deemed natural that students might complain about lengthy questions and a lot of items to fill-in, thus, the author sought that questions were precise and concise and written in conversational style.

Covert Attitude

Open and distance learning such as this proposed ECON Z was susceptible to covert attitude among participants. This issue of secrecy in posing as someone else such as a teacher posing as a student in order to have a student-level participation that would suffice the project's objective was not only inimical to the participant and author but would render the entire project invalid and inauthentic. In order to solve the issue on covert participation, it was important that the author disclosed all information relevant to the participants, their roles and responsibilities defined including freedom to participate or not. Next, insistence on anonymity of identity was supposed to relieve student participants from pressure of poor learning contributions, inactivity or any other infuriating occurrence that students would experience in the process. To this end, it was imperative that the issue on covertness was explicitly articulated in the consent form to guard moral rectitude of the project process. Lastly, it could not simply be dismissed that covert behaviour in online learning has a tendency to be pervasive so that the author had to articulate authentic participation in all learning activities of this online course.

RESULTS OF THE STUDY

Course Evaluation

To obtain information on student learning in the online subject, participants were asked to fill out a questionnaire with 10 items using a 5-point Likert Scale (1-strongly disagree to 5-strongly agree). Of the 50 students that enrolled in the course, 62 % (31 respondents) filled out the questionnaire with some comments on overall learning experience mentioned by some learners. The following table summarizes response rate in percentage for each item.

Descriptive statistics such as mean score and percentages were used in processing the quantitative data. The choice of these simple statistical tools was deliberate as the study was mainly focused on qualitative aspects of autonomous and collaborative learning.

Table1. Response Rate of Questionnaire

Item	Response Rate
1. I could study the lessons on my own	87.74
2. I could relate my experience in the lessons.	85.81
3. I could pace my own learning without strictly following topic sequence.	85.16
4. Technological learning with the use of the internet was good for my learning.	83.87
5. I could share my experiences freely.	83.87
6. I felt comfortable with my classmates.	83.83
7. Teacher's presence was felt.	83.23
8. Some activities were collaborative.	87.74
9. The subject was knowledge-centered.	87.74
10. My classmates were responsive	85.16

It is clear from the table that items 1, 8 and 9 received the highest percentage response (87.74) indicating high autonomous learning in the sense of independent study ("I could study the lessons on my own") and for item 8 (some activities were collaborative) that plainly suggests engaging and collaborative learning in some aspects of the course). Next, item 9 on knowledge-centeredness of the course also received 87.74 which explains high knowledge content in the online course.

Items 2-3 received 2nd and 3rd overall ranking of student response. It can be deduced that autonomous learning with aspects of independent study, ability to relate experience and self-directed learning from items 1-3 received the highest response.

In collaborative learning, disparity in quantitative result was observed with item 8 ("some activities were collaborative") getting the highest (87.74) on collaborative activities while item 10 ("my classmates were responsive"), on classmates' responsiveness, item 5 ("I could share my experiences freely") at 85.16 and item 6 ("I felt comfortable with my classmates") at 83.83 ranked comparatively low. The disparity is attributed to the drop in ranking from first (item 8) to low ranking for items 10, 5 and 6.

On the issue of technological learning, the response rate was comparatively low at 83.87 while teacher's presence received the lowest percentage mark at 83.23 with a small difference of 0.64 from technological learning. Even with the ranking result, the figures indicate high presence of all items above 80%.

Mean Scoring

Consistent with ranking from the Table on Response Rate, items 1, 8 and 9 received the highest mean value at 4.387 (5 being the highest from the 5-point Likert Scale). All items indicate high presence of autonomous learning on the notion of independent study, collaborative learning activities in some areas of the course and knowledge-centeredness.

Table2. Mean Score of Questionnaire Item

Item	Mean
1. I could study the lessons on my own.	4.387
2. I could relate my experience in the lessons	4.25
3. I could pace my own learning without strictly following topic sequence.	4.19
4. Technological learning with the use of internet was good for my learning.	4.19
5. I could share my experiences freely.	4.19
6. I felt comfortable with my classmates.	4.19
7. Teacher's presence was felt	4.16
8. Some activities were collaborative.	4.387
9. The subject was knowledge-centered.	4.387
10. My classmates were responsive	4.25

Item 2 on student's ability to relate experience and item 10 on student responsiveness with mean scores at 4.25 and 4.25, ranked 2nd and 3rd, respectively. Both items incorporate autonomous and collaborative aspects of learning. Technological learning on item 4 received a mean score of 4.19 along with aspects of collaborative learning ("I could share my experiences freely" and "I felt comfortable with my classmates"). Teacher's presence has the lowest mean score at 4.16.

It is worth noting that a mean score of 4 means the participant "agrees" to the question item while 5 represents "strongly agrees" from the Likert Scale which suffices to say that responses were positive for all items. All items are closely clustered within the 4.0 mean

range indicating a small difference between the means of all items.

Distribution of Score Ratings

Table 3 depicts collaborative activities in item 8 and knowledge centeredness of the subject in item 9 with the highest percentage response at 61.29% for ‘strongly agree’. This is followed by item 1 representing independent study with 54.84% for “strongly agree”. Items 2 and 3 (both items represent autonomous learning received 51.61%. in effect, students highly agreed autonomous learning (items 1-3) as a beneficial approach.

Table3. Percentage Distribution of Questionnaire Items in 5-point Likert Scale (31 responses)

Item	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Dis- agree (1)
1 .I could study the lessons on my own.	54.84	35.48	6.45	3.23	0
2. I could relate my experience with the lessons.	51.61	32.26	12.90	0	3.23
3. I could pace my own learning without strictly following topic sequence.	51.61	25.81	22.58	0	0
4. Technological learning with the use of the internet was good for my learning	38.71	45.16	12.90	3.23	0
5. I could share my experiences freely.	48.39	32.26	12.90	6.45	0
6. I felt comfortable with my classmates.	48.39	25.81	22.58	3.23	0
7. Teacher’s presence was felt.	32.26	51.61	16.13	0	0
8. Some activities were collaborative.	61.29	19.35	16.13	3.23	0
9. The subject was knowledge-centered.	61.29	25.81	6.45	6.45	0
10. My classmates very responsive.	45.16	45.16	6.45	3.23	0

Items 5 and 6 as collaborative learning items received 48. 39 (12.9% lower from item 9 which is an element in collaborative learning) followed by item 10 at 45.16 depicting classmates’ responsiveness.

Furthermore, technological learning got a low 38.71 in the ‘strongly agree’ portion but ranked second in the ‘agree’ portion signifying a general consensus of technological learning beneficial for student learning.

Teacher’s presence posted the lowest at 32.26 in the “strongly agree” section. However, students generally agreed that teacher’s presence was felt with the highest percentage rate at 51.61 and the remaining students perceived neutral for this item.

It is noticeable from the table that small percentage of responses leaned towards “disagree” while 90% of “strongly disagree” posted zero mark indicating high responses on “agree” and “strongly disagree” in most of the items of the questionnaire.

Based on the table alone, it can be deduced that collaborative and autonomous learning received positive marks for learners in the online course.

DISCUSSION OF RESULTS

Autonomous Learning

Independent Study

Items 1 and 3 (elements of autonomous learning) posted high marks from the questionnaire. In the first item, “I could study on my own”, independent learning was received positively with 87.74% of the responses concurring its beneficial help to learning. In discussing autonomous learning, the following student remarks are worth pondering:

- “learning alone made me focus my study”
- “the course was completely laid out with readings and links for further study, thus, no need to have a teacher to explain”
- “I was freely choosing topics to study”

The first comment attests to the self-directed, independent approach to learning as underpinned by Wedemeyer’s Theory of Independent Study. “Learning alone made me focus my study” highlights a deep learner-content interaction that enhances student cognitive skills such as critical thinking and application of knowledge. Moreover, some of the students preferred to study alone in internet shops where internet connection was fast while others opted to navigate through the Moodle site using smartphones only that content availability was limited, as articulated in the comments.

Knowledge-Centered

Based on the table on mean score, knowledge centeredness of the course ranked 1st at 4.387 together with item 1 (“I could study the lessons on my own”) and item 8 (“some activities were collaborative”). It also ranked 1st in the “strongly agree” column at 61.29. Consistency of its rank is explained in the next paragraphs.

First, the author designed the course such that content found in the modules and other learning materials provided sufficient knowledge of pertinent concepts in introductory economics. In addition, the design allowed students to use resources found in the internet as seen in the various video tutorials and website links intended for further understanding. Technological affordance along with modular readings was meant to hone thinking skills of learners relevant to the subject domain.

The foregoing reasons are grounded on some citations from the literature. Jon McPeck (2000) and other critical thinking theorists argue that teaching general thinking skills and techniques is useless outside of a particular knowledge domain in which they can be grounded. As Bransford et al. (1999) argued, effective learning abounds in the epistemology, language, and context of disciplinary thought.

Analysis of student posts revealed that Anderson’s knowledge-centered view of online learning was actively pursued in the learning context. Module 2 (Law of Supply and Demand), for example, was aimed for students to explain the relationship between demand and supply as applied in real world context. Various student posts in the discussion forum highlighted knowledge gained from the module and video tutorial as evident in the correct responses to the question, “what is the relationship between demand and supply”?

Likewise, the author observed that the student who made the comment, “learning alone made me focus my study”, actively participated in the self-directed approach to studying module 2 highlighting individual learning tasks in the activities embedded in some sub-topics. Furthermore, the student posted website links on his own initiative without asking consent from the teacher in order to answer a question on application of the law of supply and demand in real world setting. Taking responsibility for his own learning, an active element in learning autonomy was clearly observed here.

To continue, topics from 1- 8 centered around knowledge learning as the online subject is aimed to orient students with principles and theoretical perspectives of economics. One of the content-based responses is worth mentioning:

- In the video, aggregated demand (AD) has three components: consumption, investment, government purchase and net exports. The equation is $AD=C+I+G+NX$

In such response, the student has demonstrated knowledge in identifying components of aggregate demand followed by the given equation – such knowledge demonstrated after watching the video. In other words, the use of technology (video) as a learning support provided content knowledge (components of aggregate demand and its equation). It will be noticed that the video was instrumental in gaining knowledge as articulated in Wedemeyer’s “Independent Study” that encourages the use of technology such as the Web that immerses the learner in various Web-resources. However, even with high knowledge content of the course, rote learning was not its main goal but rather for students to analyse, reflect and relate lessons with authentic experience.

Based on the foregoing explanations from the author's observation, student response and literature citation, knowledge centeredness of the online course was effectively employed.

Learner-Centered

From the table on mean score, 4 items were construed as learner-centered themes of autonomous learning. Combining the scores of these items (1, 2, 3, 5) revealed an average score of 4.25, ranking second from the average of collaborative learning themes (items 6, 8, 10) at 4.27 with a very small difference of 0.02. From the table on percentage distribution of items in the Likert Scale, average percentage for similar items on learner-centeredness was 51.61 while collaborative learning themes had the same average percentage at 51.61 (average scores refer to the 'strongly agree' column (5)). In the 'agree' column (4), average score for learner-centered themes was 31.20 while average score for collaborative themes was 30.11, lower by 1.09. Finally, the table on response rate had an average percentage of similar themes in learner-centeredness at 85.65 while collaborative themes at 85.58, lower by 0.07, a very small difference.

Based on the foregoing quantitative results, learner-centered themes ranked 1st in two tables and 2nd in the mean score table with a small difference of 0.02. The following explanations attest to the high results.

First, the author designed the subject in such a way that students would be able to express freely throughout the learning process. For instance, a 'self-introduction column' before the formal opening of lessons was posted so that students can introduce themselves to the class. Its purpose was not just to introduce names but to have a sense of comfort from shared stories – such stories that would elicit background, interests, among others. Literature studies indicate that online teachers must make time at the commencement of their learning interactions to provide incentive and opportunity for students to share their understandings, their culture, and the unique aspects of themselves (Dixon, 2007). Furthermore, they should provide opportunities for students to introduce themselves and express any issues or concerns to the teacher and the class (Dixon, 2007).

Another aspect of course design that the author implemented was the conversational manner in asking questions at the various discussion forums that exemplified 'guided didactic interaction' (Holmberg, 1989) where the teacher used simple, conversational language to entice students to respond freely and comfortably. Such phrase as "feel free to elaborate your ideas" was used repeatedly in almost all discussion topics.

From the qualitative result of the study, analysis of student posts in the forum, "Thinking like an economist" revealed an active application of learner-centered approach to education as explained in Anderson's Model of Online Learning. For one, different socio-economic and cultural backgrounds of learners, some coming from middle-class families and others from lower income groups shared different views in the discussion on spending based on a scarce resource. Further on, probing into one student's view of non-rational behaviour of Filipinos in utilizing scarce resources resulted in deep cognitive processing from various perspectives and insights as seen in the forum posts. This purposeful search for meanings of rationality and non-rationality resulted in building of social knowledge from multiple perspectives did not only illuminate knowledge but students' cultural and economic statuses were mirrored as well.

Lastly, student dialogues in the forum exemplified social constructivist view of learning that posits social learning emanating from shared discussions. This view of knowledge co-production signifying presence of collaborative learning among autonomous learners was observed in the course as explained in Anderson's "Independent Learning".

Problem Based Learning and Constructivist Learning

From the quantitative procedure, item 2 ("I could relate my experience in the lessons"), a constructivist theme posted 4.25 mean score, ranking 2nd with a small difference of 0.137 from the highest mean. In the table on percentage distribution of the Likert scale, item 2 posted 51.61% in 2nd rank for 'strongly agree' (5) while in 'agree' column (4), it posted 32.26, dropping its rank to 4th, and in the table on overall response rate, item 2 received 85.81%, 2nd from the highest. Analysis of the figures indicates that constructivist learning was received positively by the students in the general sense. Careful look at the figures (51.61 for 'strongly agree' and 32.36 for 'agree') can be construed as a high acceptance of constructivist learning as seen in the large discrepancy in favor of 'strongly agree'. These high results are explained in the succeeding paragraphs.

From the author's perspective, a strong presence of Problem Based Learning (PBL) was employed in topic 4 where at the beginning of the lesson, an ill-structured problem was designed by the teacher for students to solve based on authentic, real-life solutions. The PBL design included tasks as guide to finding solutions but students were left to carry out the procedures based on experience. Another constructivist approach to design was carried out in the forum, "thinking like an economist" and "economics as a way of life" where students were asked to reflect on the given topics. Phrases like "relate the topic to your own experience", "reflect on making choices" helped the author in making sure learning was grounded on students making sense of their own learning. In another forum on "good and bad things about cost", it is worth mentioning the constructivist learning task the teacher asked the students: "Based on your expe-

rience, what would you consider as some good lessons from incorporating cost in your activities like buying, producing, etc.? What difficulties would you consider? Feel free to elaborate your answer.” Finally, aspects of constructivism were seen in the essay portion of the quiz where students were asked to share experience-based insights on the given topic.

Importance of constructivist learning in economics is well-articulated in the literature. The essential core of constructivism is that learners actively construct their own knowledge and meaning from their experiences (Gordan, 1995). Furthermore, learners are not passive recipients of knowledge, rather active in their construction of knowledge and meaning. This activity involves mental manipulation and self-organization of experience and requires that students regulate their own cognitive functions, mediate new meanings from existing knowledge, and form an awareness of current knowledge structures (Woldab, 2013). In learning economics, as per constructivist pedagogical concern, learning economic facts and theories is a matter of associating and attaching new meaning to past cognitive experiences, constructing new explanations, experiences and making decisions (Woldab, 2013). Finally, students in problem based learning possess the action and reaction which display self-directed learning skills (Blumberg & Michael, 1992).

Finally, the high response of students to constructivist strategies such as relating prior experience, introspection and reflection evident in the Problem Based Learning approach in much of the learning activities eased out the technical difficulty that is generally inherent in an economics course. With this course, students, by way of integrating real-life experience into the lessons, were able to connect concepts to everyday reality such as cost and budget management, allocation of scarce resources, saving for future consumption. Instead of presenting the lessons using highly technical terminology and abstract graphical representations, students were presented with practical examples and questions highlighting a learner-centred approach which motivated them to learn.

Cognitive Learning

This section has similar quantitative results from the previous one (Problem Based Learning and Constructivism) due to the close similarity of the two themes. In addition to the foregoing statements, different perspectives of cognitive learning are explored in the next paragraphs.

From the perspective of design, cognitive learning was sought in topic 4 where Problem Based Learning probed on students' thinking through construction of solutions to an ill-structured problem. For instance, two of the identified tasks were phrased “things/concerns you think..,” construed as a mental process of constructing “things and concerns” on a given task. This thinking process allowed for learning grounded on prior experience to be integrated in finding solutions. Furthermore, with the way the phrase was formatted, metacognitive learning by examining one's thinking was designed to emanate following the constructivist nature of PBL. Apart from PBL, forum discussions were designed to reflect, instigate personal insights of certain topics allowing freedom to explore possibilities grounded on authentic experience.

Based on student perceptions through the virtual discussions in the course portal, discussion on allocation of scarce resources in the forum, “thinking like an economist,” illuminated deep cognitive processing when some learners shared their own views on allocation. To illustrate, one student explored the concept of man and his environment taken from a Polynesian myth that calls the ocean as God as it is the center of economic activity, thus, must be respected, not exploited. He went on to tell the “myth” of Christ in allocating resource by way of sharing bread to his disciples, helping the poor, the sick and the blind. The examples can be gleaned from a student's profound understanding of allocation of resource comprising his cognitive structure. These packets of knowledge or schemata constitute prior learning assimilated into current knowledge of allocation of scarce resources.

Next, discussion on inflation and unemployment in topic 7 elicited integration of prior knowledge of unemployment when one student shared his experience after super typhoon Yolanda left people without jobs and how cash-for-work program of the government provided some financial relief to meet their needs. Subsumption of such knowledge was carefully handled by the teacher by emphasizing financial assistance in the form of transfer payments such as donations as opposed to salary received from work, both receiving money but the former requiring no job performance while the latter instigating employment remuneration.

The aforementioned explanations are foregrounded on Cognitive Learning Theory (CLT) which implies that the different processes concerning learning can be explained by analyzing the mental processes first (Sincero, 2017). With effective cognitive processes, learning is easier and new information can be stored in the memory for a long time. On the other hand, ineffective cognitive processes result to learning difficulties that can be seen anytime during the lifetime of an individual (Sincero, 2017). In the study of economics, cognitive psychology has some influence in the learning process. Cognitive economics examines the presence of extraction of information from the environment through perception, and the development of knowledge through communication (Paquet et al, n.d).

Teacher's Role

Quantitative results in item 7 (“teacher's presence was felt”) posted the following results: mean score (4.16), percentage distribution of questionnaire in Likert Scale (32.26 for ‘strongly agree’ and 51.61 for ‘agree’) and in overall response rate (83.2) construed as comparatively low although the figures are categorized in the high range. However, closer scrutiny of the quantitative data presents some discrepancy such as in the 5-point Likert Scale distribution where ‘highly agree’ received lower percentage but higher in the ‘agree’

column which can be stressed that teacher's presence was generally felt, but differed in its intensity. The following reasons are then explored.

From the author's perspective, the design followed a learner-centered approach to learning with minimal instruction from the teacher and facilitation, guidance in student activities considered as main tasks. With this, collaborative discussions along with independent learning modes centered most of the learning activities embedded in the course site. This, however, did not dismiss the role of the teacher in preparation of learning materials such as modules, selection of open educational resources (OER), writing of assessments not mentioned in class discussions but generally understood by learners as the high rating at 51.61 in the 'agree' column indicates.

From the students' perspective, teacher's comparatively unstable ratings can be expounded further. The comment, "the course was completely laid out with readings and links, thus, there was no need for the teacher to explain" can be explained by the fact that some learners might have hoped immediate response from the teacher in each of their posts. Learners as new to the online platform might not have fully grasped the essence of teacher facilitation as an important role in online teaching as opposed to the highly instructive classroom teaching where some participants have been accustomed to as articulated in the reasons for going online. Those who expected the same mode of lesson delivery could have rated low in teacher's presence.

In contrast, some students "agreed" teacher's presence was felt as seen in the quantitative result were those who embraced teacher's facilitative role, responding to some posts and encouraging further discussion of the topic at hand. This teacher-learner communication enhanced self-directed learning on the whole.

From the literature, Salmon (2000) describes the teacher's role in online conferencing is to facilitate learning. Her description suggests that the e-moderator does not require extensive subject matter expertise; instead, they need qualification at least at the same level and in the same topic as the course for which they are moderating. Similarly, student activity is influenced by tutor behaviour. Continual tutor presence, characterized by short messages acknowledging a student's contribution and followed by guidance, increases student activity (Tagg and Dickenson, 1995).

The above statements may spawn arguments for those teachers in face-to-face class where expertise of instruction is of utmost importance to become effective. In online setting, however, the teacher switches role to more of a tutor guided by the principle of student-centred learning. Yet, it is to be stressed that teacher's facilitative role is one among many functions to be considered. Based on the TPCK model (Mishra and Koehler, 2006, p. 1029) as discussed in the theoretical underpinnings, online teacher should possess technological, pedagogical and content knowledge. From the Community of Inquiry model, teacher's role extends beyond facilitation to course preparation, implementation of learning activities and providing formative and summative assessments.

Learning Control

From the quantitative data, learning control in item 3 ("I could pace my own learning without strictly following topic sequence") got a mean score of 4.19, 51.61 in the percentage distribution and 85.16 in overall response rate. All figures were ranked 3rd based on individual items. From the figures, the low mean score (4.19) is worth pondering. When the course initially started, students were overwhelmed by the abundance of textual presentations at the course website. From general announcements to learning units broken to 8 topics embedded with modules, the teacher received comments from students via e-mail asking what to do with all the topics outlined right before their eyes. Some asked if they had to follow topic sequence in answering questions while others wanted clarifications on how and when to post answers. These confusions could have affected the low mean score on their ability to control learning. Nevertheless, this could have been avoided if topics were presented on a weekly basis instead of the entire 8 topics shown altogether. From the author's perspective, weekly presentation of topic was avoided due to the uncertainty of student enrolment, participation in learning activities, among other concerns.

Next, even if the self-paced nature of the course design was encouraged, movement of topic from one to the other inherently 'required' prior learning of previous topics since most of the tools in economics build from one to the next in network connections. This somehow affected students' ability to literally jump learning topics at their own pace although qualitative results tell that students studied freely. This was evidently seen in the date of student posts that didn't follow sequential order from 1 to 8.

Contrary to the low mean score, the following qualitative data account for high degree of learner control. From the perspective of course design, learning control was present in learning flexibility articulated in teacher's announcement on freedom to choose any topic from 1-8 without strictly following sequence; deadline-free assignments such as the critical paper; problem based learning and online workshop to be accomplished freely and quizzes as voluntary tasks. This self-directed, learner-centered course approach was employed with the author's perception that flexibility in autonomous learning can be truly maximized if the course design encourages learning without restrictions.

From the qualitative data gathered, the comment, "I was freely choosing topics to study", explains learning control was exercised among learners in the course. This was evident in students moving from one topic to the next at their own pace, time and preference.

In essence, 'associasionist perspective' of learning (Mayes & Freitas, 2013) that builds on sequential learning from easy to difficult topics was downplayed.

Another aspect of learning control observed was that reflective queries received large student responses, while those that required modular reading received comparatively lower number of responses. In another instance, some students finished the quiz while others did not, and many did not even try. Finally, the course was open since December 2016 but many students enrolled by January 2017 already even if invitation to enroll was sent via their individual emails as early as December 4, 2016.

These results have shown that learners practiced considerable degree of learning control. From the literature, individualized learning, increased collaboration, and learner autonomy are among the advantages of online learning (Guth & Helm, 2010; Lai, 2013; Levy & Stockwell, 2006). Likewise, learner autonomy concerns embarking on the path of self-directed learning through which the learner takes initiatives, monitors progress, and evaluates individual learning outcomes (Benson, 2013).

Roles of ICT

Based on the questionnaire data on technological learning (item 4), technological awareness of students in this course was generally on the average as item 4 in Table 3 indicated higher tendency to "agree" at 45.16% compared to a lower 38.71% on "strongly agree". In the overall mean score, technological learning ranked second from the lowest among all items. Item 4 also received the same ranking in the overall percentage response at 83.87%. From the results, it is worth noticing that the mean score for this item was comparatively low. Some reasons can be attributed to lack of consciousness on the student part that online learning was indeed technological learning. When asked why, the author found out that even if internet mediated their learning in the online subject, some made no difference at all between classroom-based and online learning. All that mattered was that they responded to the question as what would normally happen in a class.

In explaining the result, the concept of 'pedagogy of nearness' (Mejias, 2003) that articulates online interaction, collaboration, and learning are neither valued nor devalued as compared to interactions with those near at hand becomes relevant. In the context of this online subject, 'pedagogy of nearness' was observed in smooth-flowing interactions among peer learners with some using the phrase "yes, kuya" (yes brother), for instance, indicating personal connection. It was also found out that most of the highly interactive students were classmates in campus learning at LNU so there was no clear-cut distinction between online conversation and face-to-face contact. In a sense, it was continuing communication between students and with the teacher that put 'pedagogy of nearness' in a network-based setting in a crucial role to achieve positive learning results.

Corollary to 'pedagogy of nearness' is the idea of continuum of interaction with or without ICT. From the literature of this study, it was found out that some studies would emphasize continuity of interaction among peers or with the teacher in an online setting as paramount to the overall educational process and the effect of ICT package that provided learning scaffolds should not interrupt the learning process. In the case of learning 'pedagogy of nearness' was the best application of such learning continuum.

Next, the principle of '*uses determinism*' can be construed as "the medium is not the message." Learning experience of students indicated that technology was solely used as an aid to knowledge construction, as a means to achieve learning targets. Except for some issues of low internet connection, technological learning provided learning continuity to students through using internet resources as learning scaffolds, answering automated quiz and computer mediated communication among peer learners and with the teacher.

Finally, poor technological awareness could be associated with less multimedia presentations in the course except for the video tutorials in some learning topics. In another interview conducted by the author after the course activities, one student reasoned that animated lecture where the student could actually draw graphs was missing. From the standpoint of design, interactive multimedia package was not employed in the conduct of learning for economic reasons. WinEcon ICT package could not be used as there was monetary payment required. This was the only reason why it was not adopted.

was not available when the author designed the course.

On the issue of pilot testing, the author wanted to provide a broad participation of learners not just the target learners (LNU undergraduate students) but professionals, non-working people as well so that a more holistic view about online learning would be generated. Doing so required a lot of convincing from the author's previous students and friends to participate without any form of incentive. In the case of the undergraduate students of LNU that provided the bulk of learners, the incentive was to raise midterm exam results for those who could join.

CONCLUSION

In conclusion, students earned autonomously through independent, learner-centered and knowledge-centered study by employing constructivist and cognitive strategies with a high degree of learning control. Next, technological learning was made possible in ECON Z through the use of the internet and the Web was construed as an aid and support to knowledge construction in a learner-centered envi-

ronment where the importance of student-student, teacher-student interactions illustrating 'pedagogy of nearness' as a learning continuum was paramount in the learning process. Both quantitative and qualitative findings addressed the issue of lack of awareness of students on technological learning even with internet technology mediating the learning process. "Pedagogy of nearness", placing on-line learning and face-to-face class of equal importance emphasizing learning continuity, proved to result in relatively low distinction between the two modalities which resulted in high interaction but lower in technological awareness.

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