Reconstructing Classroom Routines through On-line Instructional Delivery Technique

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Abstract

This study investigated the impact of leveraging and harnessing students' a-priori experiences in on-line discussion as basis of integrating new ideas and information in constructing a body of knowledge cognizant to enhancing the over-all students learning. This was done in a collegial, constructive and democratic learning towards classroom efficacy through on-line instruction delivery technique. A total of 34 students enrolled in Fundamentals of Statistics was used in this study. Learning segments through virtual instruction were included in the process of developing classroom tasks vis-à-vis with the lessons' goals and objectives. A questionnaire was adopted in determining the perceived relative magnitude of advantages of the on-line instructional delivery technique. Using Pearson-r correlation, a very-strong positive relationship was found between the students' a-priori experiences in on-line discussion and their success in OIDT; a moderate to strong positive correlation were established between OIDT and students' performance in formative evaluations, classroom interaction and academic performance.

Key Terms: A-priori On-line Learning Experiences, Academic Performance, On-line Discussion, On-line Instructional Delivery Technique, Virtual Learning Environment.

1. Introduction

The eve of the 21st century is the threshold that leads educationists to divert from the traditional classroom initiatives to contemporary initiatives that make the classroom learning situations more dynamic. One of these initiatives is the introduction of on-line instructional delivery technique in promoting classroom efficacy.

On-line instructional delivery technique is the introduction of on-line communication and multi-media tools as key modalities of instruction. This includes LMS, on-line mentoring, chat room/bulletin group discussion, e-mail exchange, among others.

Advanced technologies enhance the spirit of the virtual world in any learning environment. These modalities enforce the learners to improve his own-paced independent learning, and enjoying greater academic freedom in the context of life-long learning.

Apparently, advanced technologies and communication facilities is imperative to interactive learning experiences in optimizing competencies in education at all levels. This culture will be prevalent in the future as it is one of the thrusts of the World Declaration on Higher Education for the 21st Century. The exciting challenge among educationists is to shift some of the modalities of the conventional teaching-and-learning routines that will help improve learning efficacy leading to the development of their active-uncovering techniques of cause-effect probing skills both in theory and in practice.

This practice in educational technology has been prevalent in higher education as most institutions of higher learning introduce some courses and programs using on-line technologies as a potent tool in their instruction (Beller & Or, 1998; Schmidt & Brown, 2004). This modality enhances student learning in the advancement of educational technology in the higher education institutions as it further enhances students' skills in constructing a body of knowledge through computer technologies (Beller & Or, 1998; LaRose, Gregg & Eastin: 1998, Kandies & Stern, 1999; Sanders & Morrison-Shetlar, 2001; Schmidt & Brown, 2004)

The dynamic features of the success of on-line instructional delivery techniques, as infrastructure in course development, has led to the development of valid bases on the establishment of on-line learning environment as an alternative to traditional instructional delivery which is practiced in most of the universities worldwide. However, there is no sufficient exploration on the effects of this on-line instructional delivery technique in the context of reconstructing classroom routines in a traditional instructional environment.

Findings show that there is synergy on on-line instructional delivery technique as student-learners can control their pacing with enjoyment. This became a concomitant factor in sustaining their interest as they develop better attitudes towards learning. They also find that technology familiarity is positively related to receptivity for on-line instruction,

and that technology accessibility is not significantly related to receptivity for on-line instruction (Fitzelle & Trochim, 1996; Chester & Gwynee, 1998; Kandies & Stern, 1999; Christensen & Kessler, 2001; Schmidt & Brown, 2004; Sanchez, 2009).

Studies examining student attitudes and learning related to on-line instructional delivery technique found that students participating in an on-line class had mixed levels of interaction and satisfaction with the teacher and with reactions to their ability to create learning communities through on-line tools (Potter, 1998; Benbunan-Fich & Hiltz, 1999; Sanders & Morrison-Shetlar, 2001; Schmidt & Brown, 2004; Anderson & Elloumi, 2004; Sanchez, 2009).

2. On-line Learning Model

Figure 1. On-line Learning Model Showing the Types of Interactions. Anderson & Elloumi (2004). Theory and Practice of On-line Learning. Athabasca University.
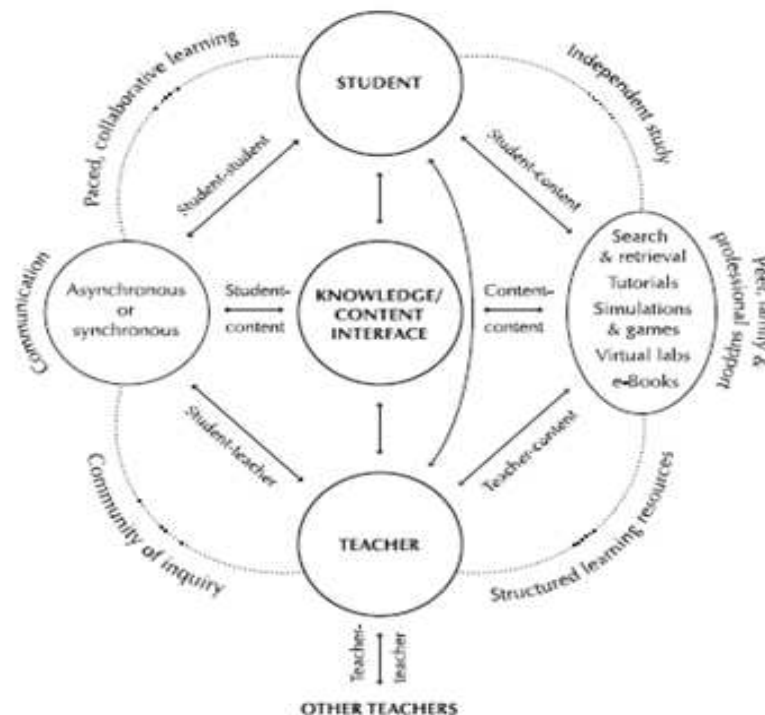
Presented in the model are the two main actors of the educative processes, the teacher and the student-learners, interacting in a constructive learning environment of different modalities. It further presents the difference between independent and paced collaborative learning modalities.

In independent learning modality, learning happens in a sequenced and a directed or structured learning environment putting the content as the heart of the process. The teacher controls the content where the student-learner interacts.

On the contrary, learning happens in a community of inquiry in a self-paced cooperative learning. Learners interact with varied learning modalities of synchronous and asynchronous activities of rich learning environment. This environment allows cooperative attainment of the learning contents' objectives and the development of personal relationship among the student-learner participants.

Examples of the synergy developed in these sequences, but not limited to the following, pave for more success towards the students' tasks towards independent learning: creativity through association, drill and exercises, behaviors through simulation, feedback and practice, sound judgment from received feedbacks and coaching among their peers, analysis, deconstruction and practice to both synchronous and asynchronous learning activities.

3. Objectives of the Study

This study is designed to determine the learning impact of on-line instructional delivery technique with embedded on-line learning experiences in the attainment of the select portions of the course materials in Fundamentals of Statistics.

Specifically, it sought to determine the following:

3.1 What are the a-priori learning experiences of the student-learners in on-line instructional delivery technique?

3.2 Is there a significant relationship between the students' a priori experiences and the characteristics of their success in participating on-line learning experiences?

3.3 What is the impact of the on-line instructional delivery technique on the students' success in achieving the course' learning goals and objectives?

3.4 How do the student-learners perceive the relative magnitude of advantages of the on-line instructional delivery technique?

4. Delimitation of the Study

This study is delimited to the utilization of LMS, on-line mentoring, group-chat room discussion and e-mail exchange as part of the on-line instructional delivery technique in the attainment of select portions of the course materials in Fundamentals of Statistics. It further employed the time and place dimensions of educational delivery systems (Duderstadt (1997) in O'Malley & McCraw (2000) both the synchronous and the asynchronous activities.

5. Significance of the Study

Reconstructing classroom routines through on-line instructional delivery technique is imperative to enhancing the positive transfer of learning. In Mathematics instruction, the students are supposed to be exposed in varied quantifiable experiments, problems and exercises in order to master the necessary skills. In order to achieve the mastery of these skills, formative intervention activities are to be executed in a constructive on-line learning environment.

This study is mostly significant to the development of constructive approaches to assist students in developing better academic achievement. It shall also provide bases for elaborating the communication approach responsive to the need for "more penetrating theories of mathematical thinking and learning" since the cognitively oriented science of thinking and the dynamic learning need to be harmonized with various theories of interactions and discourses of the teaching-learning process.

6. Research Paradigm

Figure 2. Research Paradigm
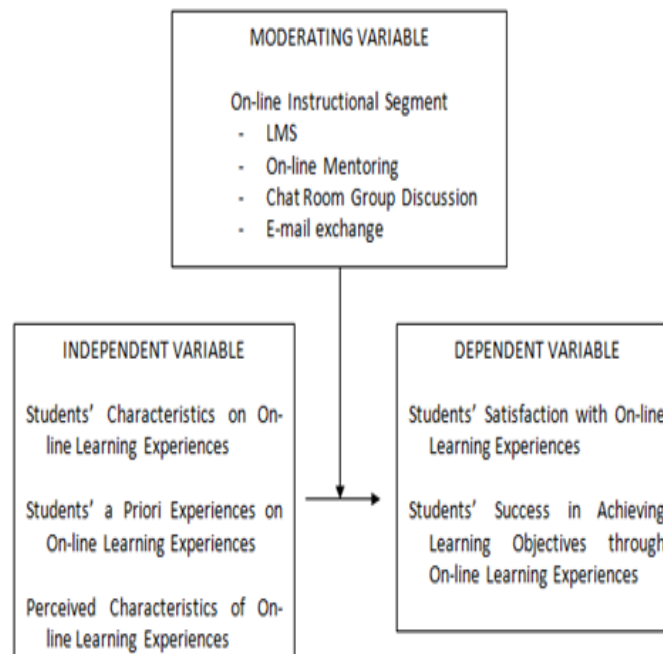
This study introduced the on-line instructional delivery technique as a way of reconstructing the traditional classroom routines. The segmentations used were the LMS, on-line mentoring, chat-room group discussion and e-

mail exchange in a community of inquiry in a self-paced cooperative learning environment.

These instructional modalities are expected to reshape the students' characteristics on on-line learning experiences, their a priori learning experiences in on-line learning experiences and their perceived characteristics of on-line learning modalities towards satisfaction and success in achieving learning outcomes of select course materials in Statistics.

7. Methodology

The Descriptive-Correlation Research Design was used in this study. The result provided bases for the causal relationship of the independent variables to the dependent variables. The impact of the embedded on-line instructional segment to the conventional classroom routines as part of the on-line learning experiences of the student-learners to the students' satisfaction and success in achieving learning objectives through this modality was also elucidated. The online instructional segments used in this study were LMS, on-line mentoring, chat room/bulletin group discussion and e-mail exchange; all were done in the e-learning facility of the university, together with the personal e-mail of the researcher.

This study was conducted among thirty-four students enrolled in Fundamentals of Statistics at the Mathematics Department, Center for General Education of AMA International University – Bahrain during the SY 2011 – 2012.

Data were collected through an observation guide, rubrics, formative examinations (developed and validated by the researcher) and a questionnaire formulated by Towel (2007), and Moore & Benbasat (1991) in O'Malley & McCraw (2000). Data were treated in terms of frequency counts, mean, percentage and Pearson-r through SPSS.

8. Results and Discussion

Table 1. A-Priori Experiences of Students in On-line Learning

	Criteria	Mean	Descriptive Equivalent
1	I am a social butterfly and use social networks (e.g. MySpace, Flicker, Facebook, among others)	4.57	Very Often
2	I use synchronous chat tools (e.g. Instant messaging, chat rooms, IP telephony, among others)	4.57	Very Often
3	I use messaging and discussion tools (e.g. E-mail, forums, phone texting like BBM, Tango)	4.57	Very Often
4	I play online games or use virtual worlds and talk to other players (e.g. World of War Craft, Battlefront 2, Sims On-line, Second Life)	4.86	Very Often
5	I have an on-line personal space other than a social network (e.g. Web pages, blogs, triond team, among others)	4.29	Often
6	I use other social and communication tools on-line (e.g. On-line dating, Friends Reunited, among others)	4.57	Very Often
	Average	4.57	Very Often

Presented in table 1 are the a-priori experiences of students in on-line learning. It presents that the respondents are extensive users of on-line discussion with a general mean of 5.57 and interpreted as Very Often. This means that their a-priori on-line experiences are rich.

It further presents that they are social butterflies in most of the leading social networks that uses synchronous chat tools, messaging and discussion tools although they seldom use personal space like web pages, blogs, triond team, among others that also use social and communication tools on-line.

When interviewed, the students admitted that they participate in on-line discussion very often as they could freely express their insights without inhibitions or coercion of being wrong. Using sound judgment to the transcripts of their discussion, the respondents mentioned that they learned from each other's ideas and knowledge to a particular topic.

The foregoing outcomes were also observed in the studies conducted by Sanchez (2009) in on-line mentoring as she

concluded that learning became direct and immediate. Hence, learning was enhanced.

Table 2. Students' Satisfaction on the Benefits of On-line Instructional Delivery Technique (OIDT)

	Criteria	Mean	Descriptive Equivalent
1	I am free to participate in the discussion more frequently than traditional courses.	4.71	Very Satisfied
2	It enables me to take more researches than the traditional classroom routine.	4.14	Satisfied
3	It develops my critical thinking abilities more than the traditional classroom routine.	4.29	Satisfied
4	I am satisfied on the use of on-line instructional delivery technique.	4.43	Satisfied
5	I would like to have more courses taught using on-line instructional delivery technique.	4.43	Satisfied
	Average	4.40	Satisfied

Presented in the foregoing table is the general satisfaction of the respondents on the benefits of on-line instructional delivery technique in Statistics. It presents that the respondents are generally satisfied with a mean of 4.40 and interpreted as satisfied.

They zeroed their high satisfaction in the provision that they could freely participate in on-line discussion more frequently than traditional courses with a mean of 4.71. In this regard, it was construed that learning took place from direct and indirect discussion with proper use of questioning, from acceptance, clarification, reflections of feelings, reassurances, suggestions, persuasion, and advice giving to the active-uncovering techniques of cause-effect probing (Anderson & Elloumi, 2004; Towel, 2007; and Sanchez, 2009).

Table 3. Relationship of the Students' a-Priori On-line Learning Experiences and their Participation and Success to OIDT

		Participation and Success to the On-line Instructional Delivery Technique (OIDT)
A-priori learning experiences in on-line discussion	Pearson Correlation	.881[**]
	Sig. (2-tailed)	.000
	N	34

    **. Correlation is significant at the 0.01 level (2-tailed).

Presented in the table is the relationship of the students' a-priori learning experiences in on-line discussion and their success in OIDT.

It presents that the two variables have a correlation value of 0.881 and a p-value of < 0.001. This means that there is a strong significant positive relationship between the students' exposure to on- line discussion and to their participation and success to on-line instructional delivery technique. It can be construed then that their knowledge and exposure to on-line discussion, where they can freely communicate without the inhibition of coercion when their answer or comprehension is wrong, is significantly correlated to their success in on-line instructional delivery technique. It was observed that students who are exposed to on-line discussion, like blogs, facebook, chatbooks, among others, are more receptive and participative to on-line instructional delivery technique. They further enjoyed

the value of interpersonal communications aided by technologies in a collegial learning environment.

This result is in conformity with the findings of Webster & Martocchlo (1992), Potter (1998), Benbunan-Fich & Hiltz (1999), Moore and Benbasat (1991) in O'Malley & McCraw (2000), Stilles (2000), Sanders & Morrison-Shetlar (2001), Schmidt & Brown (2004), Anderson & Elloumi (2004), Towel (2007) and Sanchez (2009) when they concluded in their studies that high cognitive computer playfulness and active participation to on-line discussion provides synergy towards collegial learning. These create a wagon of positive motivation and highly related to positive learning in a virtual learning environment towards classroom efficacy.

Table 4. Relationship of the Independent Variable to the Dependent Variables of the Study

| Independent Variables | | Dependent Variables | | |
| | | Performance to | | |
		Formative Evaluations	Classroom Interaction	Academic Performance
Exposure to On-line Discussion Sites/Networks	Pearson Correlation	.336	.575**	.476**
	Sig. (2-tailed)	.052	.000	.004
	N	34	34	34
E-mail Exchange	Pearson Correlation	.293	.595**	.488**
	Sig. (2-tailed)	.093	.000	.003
	N	34	34	34
Participation to the On-line Instructional Delivery Technique	Pearson Correlation	.364*	.702**	.540**
	Sig. (2-tailed)	.034	.000	.001
	N	34	34	34

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Presented in the foregoing table is the relationship of the students' characteristics in OIDT to the dependent variables which is tested with Pearson correlation using alpha-levels of 0.05 and 0.01.

It presents that there is a significant positive correlation between their participation to OIDT and their performance to formative evaluations, r-value 0f 0.364 and p-value of 0.034 at 0.05 level of significance. However, significant relationship is not identified with their exposure to on-line discussion sites and the e-mail exchange to their performance in formative evaluations. Although the students who were exposed to on-line discussion develops competencies on interpersonal communication and become superior to classroom interaction and on-line discussion, there are insufficient grounds of establishing relationship in performing mathematical tasks through problem manipulation during formative evaluation. This can be attributed to other variables of teaching and learning to task-models of mathematical skills and competencies.

On the other hand, an average to strong positive correlation is discerned between the independent variables (exposure to on-line discussion, e-mail exchange and participation to the OIDT segment) and classroom interaction: r-value of 0.476, 0.488 and 0.540 respectively, and p-value of < 0 .001 at 0.01 level of significance.

It can be pointed out that a strong to very-strong positive correlation is discerned between the independent variables (exposure to on-line discussion, e-mail exchange and participation to the OIDT segments) and their academic

performance: r-value of 0.575, 0.595 and 0.702, and p-value of 0 .004, 0.003 and 0.001, respectively, at 0.01 level of significance.

This can be interpreted that a-priori learning experiences of the students towards on-line discussion through sites or networks are associated to the students' success to on-line instructional delivery technique. Consequently, it correlates with their success in communicating their understanding in a collegial classroom discussion. This will affect their success in their academic pursuit in the subject. However, it can also be interpreted that their a-priori experiences in on-line discussion is not related to initial evaluations like drill, problem sets and quizzes. Cognition of mathematical skills and model schema, therefore, is associated after a collegial learning environment is posted in the teaching-learning process.

These findings post similar conclusion with the studies conducted by O'Malley & McCraw (2000), Stiles (2000), Sanders & Morrison-Shetlar (2001), Schmidt & Brown (2004), Anderson & Elloumi (2004), Towel (2007) and Sanchez (2009). They articulated in their studies the involvement of leveraging and harnessing students' prior experiences in integrating new ideas and information in constructing a body of knowledge cognizant to enhancing the over-all students learning in a collegial, constructive and democratic learning environment.

The interaction models of on-line Learning of Anderson and Elloumi (2004) and the time and place dimensions of on-line delivery systems of Duderstadt (1997) in O'Malley & McCraw (200) can be theorized as bases behind this cognition process where learning takes place in a community of inquiry. Learners learn in varied modalities of creativity through simulation together with deconstruction and the practice of sound judgment to feedback among their peers during on-line discussion. Hence, learning is enforced. (Stiles, 2000; Johnson, Aragon, Shaikh & Rivas, 2001; Clements, 2003; Weyers, 2004; and Sanchez, 2009).

Table 5. Students' Perception on the Benefits of On-line Delivery Technique (OIDT)

	Criteria	Mean	Descriptive Equivalent
1	On-line instructional delivery technique enables me to participate in the discussion more frequently than traditional courses.	4.43	Advantageous
2	On-line instructional delivery technique enables me to take more researches than the traditional classroom routine.	4.57	Very Advantageous
3	On-line instructional delivery technique develops my critical thinking abilities more than the traditional classroom routine.	4.14	Advantageous
4	I benefit in on-line instructional delivery technique.	4.14	Advantageous
5	I would like to have more courses taught using on-line instructional delivery technique.	4.00	Advantageous
	Average	4.26	Advantageous

The foregoing table presents the general perception of the respondents on the benefits of OIDT in attaining the course' learning goals and objectives in Statistics. It shows that OIDT is generally advantageous with a mean of 4.26. It can be explained then that OIDT develops esteem among learners in improving their own-pace towards independent learning. This poses enjoyment to greater academic freedom in the content of the course and other related learning tasks as the experiences encourage them to articulate and replicate their insights through reflective thinking and reasoning. It further probes their needs, confusions and progress to their background knowledge towards the subject matter in dialogical learning environment with their peers (Clements, 2003; Weyers, 2004; Schmidt & Brown, 2004; Beatty, 2004, and Sanchez, 2009).

This technique makes the students active participants in the learning process as it leads them in more learning focused on understanding and reasoning.

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