

# Applying the Concept of Innovation Trinity to E-Learning Analysis

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## Abstract

This research employs a concept of ‘Innovation Trinity’ to analyzing current e-Learning activities. Based on the sustainable mechanism of innovation—integrating functionality, delivery and relationship innovations appropriately, this research examines how some distance e-Learning practices serve learners for learning through a series of surveys conducted 2014-2016. It argues that the current e-Learning practices benefit learners mainly in the area of delivery, but do not show much advancement in expanding learning functionalities and forging a better learning relationship with key stakeholders. Therefore, it suggests that the future development of e-learning, especially in the field of business education, should pay more attention to eliminating “distance” between self-learning and real world applications of expertise gained via various learning media. Adding a “hands on” portion could be a frontier of e-Learning.

**Keywords:** Innovation Trinity, e-Learning, student surveys, education reform

## Introduction

E-learning has been growing rapidly since mid-1990s along with the development of world wide web. In 1995 online degrees became available but not many people really wanted to take them. Financial aid did not apply to these classes and people were still dealing with dial up internet. It took almost a decade for the American people's minds to change about online classes mostly thanks to foreign students who cannot come to the U.S. in person. Now over twenty years after the first online degrees, most universities have online classes available. There are many online universities dedicated to distance online classes. Online education is beginning to take over in colleges and universities around the globe. It is definitely on the rise in our education systems and is becoming increasingly more effective with technology. Online education could become a 100-billion-dollar global industry (Newton 2015). According to annual *Online Report Card* published by Babson Survey Research Group, over 6.7 million postsecondary students enrolled in at least one online class in 2011, compared to

only 1.6 million in 2002. Thirty-one percent of all higher education students now take at least one course online (Allen et al. 2016).

E-learning is undoubtedly an innovation in the domain of education. Therefore, it should be examined in the context of both education and innovation. Furthermore, its future development should be shaped by the logic of sustainable innovation, because the question we are faced is not whether e-Learning is possible, but how to expand or improve the quality of learning. This research employs a concept of *Innovation Trinity* to analyzing current e-Learning activities. Innovation Trinity focuses on the sustainable mechanism and dynamics of innovation. It divides innovation into three basic types in a business context: functionality innovation, delivery innovation and relationship innovation. Then, it reveals the dynamics of sustainable development of businesses and industries by examining the integration of all three types of innovations (Lan et al 2007, Lan 2009, 2010, 2013).

By employing the concept of innovation trinity, this research systematically examines how some distance e-Learning practices serve learners for learning. Firstly, it briefly introduces the concept of innovation trinity by differentiating three kinds of innovation, comparing varied innovation landscapes, and outlining the rhythm of innovation dynamics. By identifying the three dimensions of education, secondly it shows the features of current e-Learning practices and the progresses of e-Learning in three areas of innovation. The examination was the result of a series of surveys from students. According to the analysis, it finally addresses a gap existed in current e-Learning practice, i.e. the separation between self-learning and expertise's real world applications. Adding a "hands on" portion in e-learning will be an ideal way of learning.

The paper has two parts. Firstly, it introduces a new analytical framework—the paradigm of innovation trinity which can be used widely in various contexts, and demonstrates the application of the framework in a specified industry. Secondly, this paper sheds lights on the future development of e-Learning based on the systematic analysis on the current practices. It points out a possible direction for future innovation in the area of e-Learning.

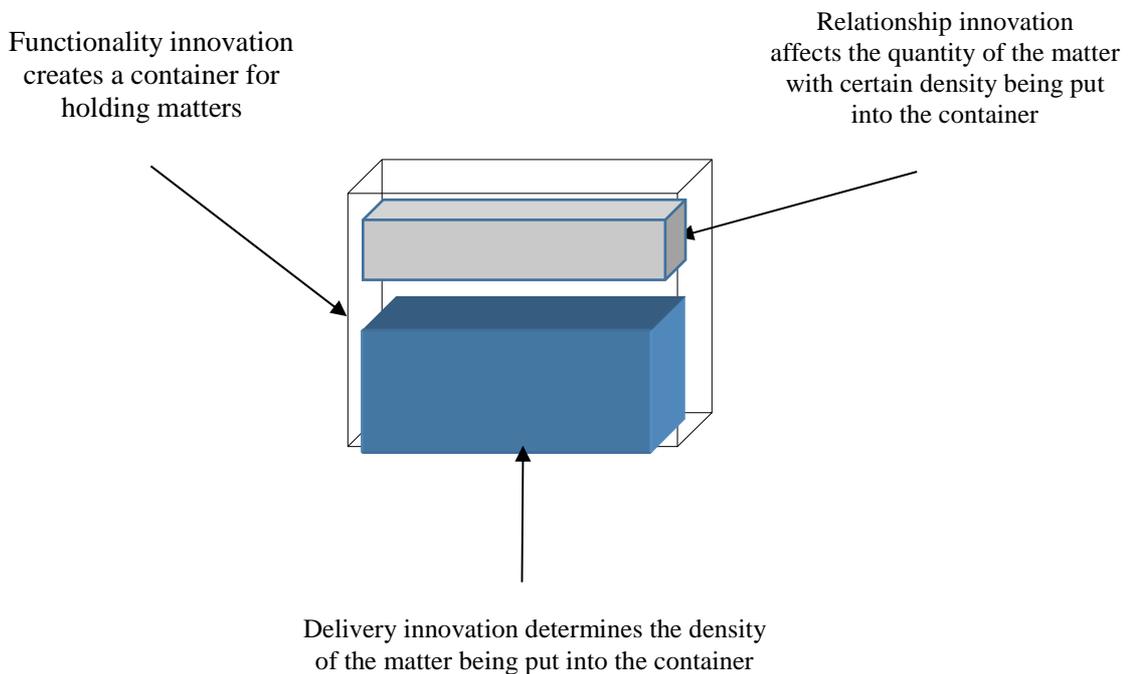
### **Innovation Trinity—an Analyzing Framework**

A feature of previous innovation studies is to use a dichotomy as a gateway for entering innovation domain. It means that innovation has always been treated as a combination of two things or two parts, such as production innovation vs process innovation, modular innovation vs architectural innovation, closed innovation vs open innovation, disruptive innovation vs sustainable innovation, functional innovation vs supplementary innovation etc. (Lan et al. 2007, Lan 2009). While the dichotomy approach offers different paths to explore innovation issues, it lacks accommodativeness to hold different parts together. For example, the popular innovation life cycle model—A-U model—developed by Abenarthy and Utterback in the 1970s, selects product innovation and process innovation as the basic building blocks, and uses dominant design as a watershed to mark the shift of innovation stages. While the model becomes one of benchmarks for indicating changes of innovation pattern, its applications for

foreseeing the innovation dynamics are discounted in the current world, due to the shortcomings of exclusion, oversimplification and insufficient sorting functions (Lan 2010).

Breaking away from the traditional innovation dichotomy, scholars (Lan et al 2007, Lan 2009, 2010, 1013) suggested a framework of innovation trinity. The framework starts with a common denominator of innovation, which consists of three basic types of innovations: functionality innovation, delivery innovation and relationship innovation. As shown in Diagram 1, each individual part of the innovation has a unique value proposition, plays a distinguished role and show different temporal dynamics.

**Diagram 1. Innovation Trinity: An Innovation Denominator**



Functionality innovation means that through providing a new or improved product/service, an entity (either an industry or a business) could demonstrate certain usage. The utility could be ultimate or collective usage to its customers. For example, a restaurant's functionality is to provide health and tasty food, a hospital's function is to provide adequate healthcare services for its patients. The role of functionality innovation in the innovation trinity is to create usage, which can be regarded as creating a container for holding some matters. The temporal fluctuation of functionality innovation shows a pattern of unsymmetrical multi-peak: the first peak usually reflects a breakthrough in creating a new utility. The second peak indicates the diversification of usage. The last peak usually shows at the end of functionality innovation life cycle and focuses on optimizing the legendary function (Lan 2010, 1013).

Delivery innovation means that through introducing a new or improved process/method, an entity could gain efficiency in delivering its functionality from the entity to its customer including the formation and transferring the utility. For example, a restaurant's delivery involves the cooking methods and distributing/consuming methods; a hospital's delivery

involves caring systems and treatment methods. The role of delivery innovation in the innovation trinity can be treated as changing the density of matters, which will be put into the container created by functionality innovation. The temporal fluctuation of delivery innovation also shows a pattern of unsymmetrical multi-peak, the same as functionality innovation. However, the intervals between peaks are varied: its first peak is usually much behind the first functionality innovation peak. Then the gap gradually reducing along with the reducing of innovation intensity. At the end, the peaks of functionality innovation and delivery innovation are coincided or are very closed (Lan 2010, 1013).

Relationship innovation means that through establishing a new or improved linkage, an entity could harvest value from generating and delivering the functionality. For example, by engaging more franchisees, a restaurant could reap more revenue from its innovation in cuisine (functionality) and cooking know-how (delivery); by changing the ownership structure, a hospital's reputation (quality and methods for providing healthcare services) could be dramatically adjusted. The role of relationship innovation in the innovation trinity can be regarded as changing the quantity of matters with certain density which will be put into the container created by functionality innovation. Differing from the other two innovations, the temporal fluctuation of relationship innovation shows a pattern of symmetrical multi-peak. The symmetry has two aspects. Firstly, peaks are more or less at the same level or intensity. The peaks usually correspond to the crucial milestones of a business or an industry such as birth, mid-life and winding down (Lan 2010, 1013).

Innovation trinity is a common denominator for innovation. It means that the success for an entity comes from conducting or handling three types of innovation appropriately, or expressed as

$$\text{Success} = \text{Innovation (F x D x R)}$$

Unsuccessful entities, one way or another, attribute their failures to the mishandling of their innovation trinity. In this context, competition between entities are reflected in the whole package instead of a single item, or expressed as

$$\text{Self-Innovation (F x D x R)} > \text{Competitor's-Innovation (F x D x R)}$$

Another element in the innovation trinity framework is innovation landscapes. Although the innovation denominator consists of three types of innovations, it does not mean that all three parts are equally represented for all entities, in all circumstances, and at all times. The differences constitute the uniqueness of each case. However, this uniqueness is confined to certain patterns. Those patterns are called innovation landscapes. Based on the possible combinations of the tripartite, seven patterns can be identified. They are functionality innovation (Inno-F), delivery innovation (Inno-D), relationship innovation (Inno-R), Inno-FxD, InnoFxD, Inno-DxR, and Inno-FxDxR. The same as in the natural world, each innovation landscape shares certain features, attracts or support certain activities, and demonstrates certain tendencies (Lan 2010, 1013).

The third element of the innovation trinity framework is clear innovation dynamics, or a more applicable innovation development life cycle model. Based on the revealing of each type of innovation, the binding forces for connecting different innovations, and differentiating previous identified innovation, Lan (2009, 2010, 2015) converted seven universal innovation landscapes into a time sequence of seven innovation stages. They are Radical innovation (Innovation-F) → Dual-core innovation (Innovation-FxR) → Cross (Innovation-FxDxR) → Incremental (Innovation-D) → Restructure (Innovation-DxR) → Engagement (Innovation-R) → Dichotomy (Innovation-FxD). The new innovation life cycle model indicates that an ideal full-length innovation chain has never been a single peak life curve. Instead, it does show multiple peaks over time. The new model also points out that there are often sustaining loops occurring between the last three stages of a full-length innovation chain, which expand industry's life cycle with a certain rhythm. The innovation chain was tested in the Typewriter industry and other industries and entities Lan 2010, 1013).

By employing the concept of innovation trinity to e-Learning activity analysis, several clarifications are needed here. Firstly, the ultimate functionality of education is to produce high quality students. Secondly, the delivery innovation in education focuses on how to train and graduate graduates. Thirdly, the relationship innovation of education aims to optimize the linkage between administrators, faculty/staff, students and employers. Therefore, formal e-Learning activities are only part of education endeavors. Education in general, whether presented in person or in an online format, has the same outcome in mind. Its purpose is to teach students and prepare them for the next aspect of their lives.

### Data Collection and Data Analysis

Data used for this paper comes from two sources. One is from *Online Report Card* authored by Allen, Seaman, Poulin and Straut (2016). *Online Report Card* is an annual survey conducted by Babson Survey Research Group since 2003. While it covers all kinds of degree grant institutes national wide, its main targets are leaders or administrators of the institutes. Therefore, the reports display strategic considerations of e-Learning providers.

Another data source of the analysis is a series of surveys on student and conducted by students. All surveys were supervised by the author. Those surveys were mainly conducted in Alaska and ranging from 2014 to 2016. However, those surveys were unplanned and unstandardized. Except to requiring minimum 25 responses, there was not any limitation for students to formulate their survey questions, chose survey medium and determine survey targets. In this way, students could explore what they were really interested in for online courses. Based on those surveys, the author consolidated them into three surveys according to the date of the survey. Table 1 summarizes the survey sizes, scopes and priorities of the surveys.

**Table 1. Student Surveys 2014-2016**

Item	2014 Survey	2015 Survey	2016 Survey
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Survey responses	73	50	85
Survey scope	-Students in all disciplines -Alaska wide	-Students in Business Management only -Alaska wide	-Students in all disciplines -Alaska and Wyoming
Survey priority	Motivation for taking online classes	Interaction with others in e-Learning	Improvement for online courses

Survey 2014 focuses on finding out students' decisions in coming to take online courses. The survey was dispersed online to e-Learning classes. At the same time, the survey was conducted around campus to get some random thoughts. Total respondent count was seventy-three. Differing from other surveys, survey two limits its survey object to students who are major in business management—either BBA or MBA students. SurveyMonkey was used for conducting the survey. The reason for selecting business management is that the School of Management in University of Alaska Fairbanks has had its first program available completely online. In the survey, the importance of interaction for learning and students' involvement in both online and offline courses was checked. Survey 2016 took a survey of college age young adults in both Alaska and Wyoming. Eighty-five people responded to the survey. It aims to describe the differences in online education compared to traditional face to faces classes with regards to variations in learning styles. Based on it, how the online education system can be improved is asked.

Although three surveys have different priorities, they all consists of two basic segments. The first one is how many students have taken online classes. The second one is how do they view their online courses. Table 2 displays the survey results and compares them with the results of the Barbason Survey. It is worth noting that there are a couple differences between Barbason survey and our surveys. Firstly, the huge gap shown in students who have taken online courses, In Brabson survey, it is only 4% student who enrolled in at least one online course. In our survey, about 90% students have done so. Furthermore, our survey found that students who take more than seven classes accounts for 48%. This because the objects of our surveys are mainly the students who are in the bandwagon of e-Learning, while Barbason's survey targets all students. It indicates that the University of Alaska System is ahead of many colleges nation-wide on the topic of online education. Secondly, our survey does not deal with the issue of instructors, except in improving online courses.

**Table 2. Results of Student Surveys Compared with Online Report Card**

Item	2014 Survey	2015 Survey	2016 Survey	Babson Survey
Students who take online course (%)	89	92	95	4
Students who view online courses as equal or better than face-to-face courses (%)	63	32	60	71
Faculty is regarded as a barrier for	-	-	-	29

online teaching (%)				
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While the data of our surveys indicates that majority of student view online courses as equal or better than face-to-face courses as shown in Table 2, the survey data also reveals that there is a general consensus that students learn more in the in-class courses than the online courses, which is reflected in output measurement in Table 3. In the survey, students are asked to check whether they learn an equal amount in online courses vs traditional, in-class courses. Few students felt they learned more in an online course. About 30% of responses felt that they learned equally in both settings. A majority stated that they learned more in a classroom setting. It is apparent that traditional modes of teaching are still highly valued, although information and communication technology has been slowly but surely changing the entire learning system. Regarding the inputs measurement, students are requested in the survey to check whether they spend an equal amount time in online courses vs traditional, in-class courses. It is surprising that ¼ of students answered that they spend more time in online classes, 1/3 of students indicate that they spend more time in face-to-face classes, while 40% of students cannot tell the difference.

**Table 3. Inputs and Outputs of Students' Learning in Different Settings**

Items	Online Setting	Classroom Setting	Both Settings
<b>Output measurement:</b> Answers to "How do you learn in different settings?" (%)	I learn more in online courses (4%)	I learn more in face-to-face courses (68%)	I learn equally in both settings (28%)
<b>Input measurement:</b> Answers to "What are your involvement in courses of different settings?" (%)	I am involved more in online courses (25%)	I am involved more in face-to-face courses (33%)	I am involved equally in both settings (42%)

The data in Table 3 shows an obvious discrepancy between level of involvement and achievement in online course settings. Few report having a better result, but one quarter reports that they involved more. Two factors may attribute to this discrepancy. One is related to courses. Students reported that some classes are less structured, or using different teaching methods. In those cases, some requirements were less predictable. Without an instructor to explain certain things, students have to spend some time to figure it out. In online courses, if a student begins to fall behind, they will become overwhelmed and may become lost in the material of the class. Therefore, students spend some time to follow the deadlines of varied assignment than in a face-to-face class. Another is related to students. Usually students who take online course takes are more self-motivated. They are usually proactive in their course and manage their time. This different from the cases in face-to-face classes, some students go to classes and don't necessarily listen or care. When things aren't clear, they would like to ask an instructor.

The input-output analysis also shows a fact that has been revealed in other study (Ni 2013) that students, who did well in previous courses in a traditional setting, would tend to also do well in online classes. A dedicated, high performing student is typically going to take control and do well in either setting because of their personality traits, such as self-motivation, and driven to complete their work on their own accountability.

**Table 4. Reasons and Comfortability for Taking Online Courses**

Items	Answer (%)	Rationales
<b>Reasons</b>	<b>100%</b>	
Flexibility	69%	Schedule, style, pace
Only offered Online	14%	No Choice
Needed Course for Degree	10%	Curriculum enrichment
“Easy” to pass	7%	Teacher was easy, or course is easy
<b>Comfortability with using computers</b>	<b>100%</b>	
High Comfortable	64%	High competent due to daily use of various applications
Low Comfortable	16%	Basic skills need some helps
Technically Uncomfortable	8%	Difficulty & frustrated
Psychologically Uncomfortable	12%	Competent but prefer F2F instructions

The discrepancy between setting preference—majority students like online courses—and learning result consensus—majority students believe learning more in face-to-face classes—makes the analysis on students’ motivation interesting. Table 4 either reveals students’ considerations in selecting online courses, or displays students’ comfortability in taking online courses. In the survey, number one reason for students to enroll in online courses is the convenience or flexibility offered by online courses. Most students state that they can avoid scheduling conflicts, and do the work on their own time and at their own pace. They also said that it fit better into their environment and their life style. Some mentioned that they can do the work at midnight, or when they want. They can review their lessons more than once according to their needs. They can manipulate the coursework to fit their learning by focusing more on their weaker topics while breezing through concepts that they already have or can easily grasp. Another reason is that online courses are their only choice, because some classes are offered only online. This is not uncommon for Alaska. Another reason is to enrich their curriculum. Easy pass is the last consideration, and less than 10% students regarding it as a motivation for enrolling online classes. The easiness can be seen from the simple contents of a course, the lenience of an instructor in grading course works, and the both. It is

apparent that many students are attracted to online courses by the convenience, availability, and flexibility of scheduling the classes, which is similar to the finding about a decade ago (Mupinga et al. 2006). However, some students made decisions based on subjects. They stated that they enjoy taking online classes for courses that aren't in their program requirements. Classes that they actually care about learning a lot and taking knowledge away, they prefer to take them in person.

Question of comfortability was aimed at determining student's comfort level with completing classes completely online, and their competency level with computers. The results show that majority of students use a computer daily and are capable of learning via computer alone. About 1/7 students stated that they felt comfortable to complete online courses given their computer skills, but they need some helps from instructor, peers or any other resources occasionally. It is worth noting that there are two types of students who felt uncomfortable. One type is technical uncomfortable. Less than 10% students reported that they often had technical problems, were not confident with their computer skills, and get frustrated when using computers. A few students stated that they really didn't like computers and had a bad experience with online classes in school. A student reported that he had to deal with dial up internet and so he couldn't submit his tests because they took too long to load and send. The other type is psychological uncomfortable and about 12% of students are in this category. Students in this group are competent on a computer, but prefer face-to-face instruction. Surveys also reveal that comfortability is increasing over time.

**Table 5. Interface and Helps for Taking Online Courses**

Items	Choices	Answer (%)
<b>Importance of face-to-face interaction in course learning</b>	Not important	12
	Somewhat important	56
	Very important	32
<b>Helps got from instructor or peers in taking online courses</b>	Extremely Helpful	8
	Very Helpful	18
	Equal Helpful	22
	Less Helpful	41
	Not at all Helpful	11

Learning is not just about the material, but how it is presented and how the information is interpreted. Table 5 presents survey results related to interface during learning. First, students were required to rank the importance of face-to-face interface in their studies. Then, they were asked to evaluate the helps they got in online courses. Regarding F2F interface, 56% of students responded that it was somewhat important, and 32% responded that it was very important. In their minds that sharing and discussing with instructor and peers are one way to reinforce topics, and deepen the understanding. There are about 1/10 of students stating that it was not important. It is not surprising that postgraduate students weight more on F2F interface than undergraduate students. For example, 63% of surveyed MBA students highly cherish personal interface and only 39% of surveyed BBA students did so.

Based on the results how students truly feel about face-to-face interactions between peers and instructors, students were given a chance to assess what kind helps they got in online courses from their instructors and peers. It is interesting that the importance of F2F interface viewed in learning does not transfer to a high dissatisfaction with helps in online courses. Nearly half students felt that they get better or equivalent helps from their instructors and peers. Some student commented that they felt like they had more communication with the distance education class because instead of only having one hour with a teacher, they have every day to talk to the teacher and other students. This situation is more obvious in postgraduate students than in undergraduate students, for example MBA vs BBA. The reason for this discrepancy is unclear. It may either result from technology advancement and instructors' efforts for help, or be attribute to the low expectation for online courses. However, students who said less helpful often commented that there was a lack of decent communication. Complains include that they did not get to know the instructor well enough; did not get adequate feedback, did not have one-on-one contact, and peers did not always take online discussion boards seriously.

**Table 6. Suggestions for Improving Online Courses**

<b>Improvement Suggestion</b>	<b>Responses</b>
Use more video conference facility (one-to-one video chat)	90%
Better communication between instructor and students	78%
Add hands on segment	61%
Use Virtual reality technology	40%
Dealing with online cheating	14%
Other (abolish them all, standardize them all)	7%

In the student survey conducted in 2016, a question was designed to ask students how they thought online classes would be changing and how they would improve them in the future. Almost all of the survey responses mentioned web conferences facilities/applications or platforms such as Skype being used to instruct distance classes. Although students have different learning styles and some process information better when they read a textbook, adding visual portion in online courses seems a consensus. It is expected that video-conference/discussions will become more common as time goes on. Another suggestion concentrates on improving the communication between instructors and students. In addition to asking their questions being answered, students expect to have multi-channel for communication. and things like that, even if it has to be a phone call instead of over email. They seem unsatisfied with email as a sole communication channel, because sometimes things can get miscommunicated over email but are harder to misinterpret in conversation of F2F or via phone. Therefore, many of them said that it would be really helpful to have someone to help them if they needed the help.

An interesting suggestion given by students is to add hands on portion in online courses. Students stated that they really hate sitting in a chair all day, and they like hands on learning and going and doing. Examples on hands on include interviewing people, finding something

out in museum, looking something up in the library, comprehending new topics by experimenting, trying out real life applications, or even watching the clouds. Also, students have a pretty high expectation on using virtual reality (VR) technology in online courses. About 40% of responses believe that VR has a high probability to revolute online education once it becomes more readily available.

Another issue pointed by students for improving online education is to prevent online “cheating”, although only 1/7 of students raised issue. It is well known that cheating is and always will be a problem with schooling but it can be even worse with online classes (Newton 2015). It is so easy for students to cheat on their assignments and tests when students don’t have anyone monitoring them while they do their work. Some students stated that during a test, students can open up two windows side by side on their computer and just type the questions to the problems into Google and most of the time it will show where the professor got the question from and it will give them the answer right away. Although less than 10% of students aired their opinions in the category of other, two attitudes are worth noting. One believes that the best way to improve online classes was to not have them online. The other believes that the best way to improve online classes was to standardize them all.

## **Discussion and Conclusion**

Several features of the current e-Learning practices can be drawn from applying the concept of innovation trinity into the analysis of survey data. Firstly, there is an alteration of functionality along with e-Learning. From the perspective of customers or users, education institutes have two functions. One is to provide trained people. The other is to grant a degree to a graduate. Theoretically, the two functions are the two sides of a coin: a degree labels a competent graduate, and a trained graduate exemplifies the level of competency. But in reality, there are gaps between them due to various reasons. Therefore, education institutions display a dual-functionality, which has been existing since degree program was offered. However, degree oriented e-Learning practices is increasing the gap, which can be seen from students’ answers on comparable learning outputs and their decision rationales. With the burgeoning of online courses, an alteration in the spectrum of dual-functionality happens leaning more towards to obtaining a degree instead of obtaining certain level of knowledge, which also can be seen from the fact that e-Learning targets more non-tradition students. If the following two conditions do not disappear, the alternation of dual-functionality may not stop. One is the diversification of knowledge sources for people to learn. The other is the recognition of a degree for employment, promotion and career development in the society. During this alternation, the linkage between the two functions can be vaguer.

Secondly, e-Learning is regarded as convenient/cost-effective delivery. Surveys show that students do not experience cost saving in taking online courses. Students stated that they spent the same amount money in an online course as in a face-to-face class. In most private for-profit universities, students pay more tuitions for a similar degree (Lerman 2015). What students really got is convenience. They are better access to learning materials and resources. They have more control over how to complete their course work and manage their learning

process. Online learning behaviors spread from proactive dedication to tricks for cutting corners, and further to engage cheating agent. However, from the perspective of e-Learning providers, online courses stand for a cost effective means for conducting the training. Cost saving can be realized through getting more enrollment, providing a larger sized class, reducing instructor number, and using less expensive instructors. National wide, it is reported that the number of faculty has gone down for online classes even though the number of students have steadily increased since 2003. Survey in Alaska found that some online courses double the size of the same offline classes. Babson survey reveals that majority of universities consider it a competitive strategy for offering online courses (Allen 2016). It is difficult to tell if the e-Learning improves the overall efficiency for learning. But its convenience for students and its cost saving for providers are apparent.

Thirdly, e-Learning has disrupted the old linkage among stakeholders but has not led to a new linkage yet. The surveys show that the digitalization of learning, generally speaking, came loose the old linkage among stakeholders. For example, the interface between students and instructors, as well as exchange between students and their peers were loosen in the online courses, termed by Bhaskar (2013) as learning isolation. Babson survey revealed that instructors were not enthusiastic to be engaged in online teaching. Furthermore, the recent falling down of ITT (Banerjee 2016), much higher default rates of student loan in private for-profit education institutes (Lerman 2015), and the emerging of “cheating agents” (Newton 2015), do indicate the deterioration of relationship among traditional stakeholders in education industry, although some portion of the linkage has been enlarged quantitatively. Both our surveys and Babson report did not indicate any new positive linkage among stakeholders being established along the e-Learning practices, albeit the digitalization of education offers more opportunities for engaging some stakeholders, such as employers, in the industry.

The above three features of the current e-Learning practices indicate that the endeavors of online education are mainly confined to the innovation landscape of delivery. As pointed by Lan (2009, 2010, 2013), most innovators will be production and distribution oriented in this pattern of innovation, in which dominant considerations are on efficiency, cost reduction, economy of scale, quality control, or on standardization. Exemplified in e-Learning, more providers will be attracted to the battle fields equipped with measures for (1) enlarging the scale of operations, including recruiting more students, competing for a larger class size, and consolidating delivery platform; (2) standardizing certain portions of delivery, counting on shepherding instructors to accept online delivery, guiding student to form a new routine, and regulating the format of online courses; (3) coping the practices of face-to-face delivery by increasing the function of platform or software, including using more visual media and materials, transplanting certain tools such as alert from physical to digital, and enhancing communication channels. However, not many e-Learning providers will pay enough attention to the decreasing of the training function, or the shift of dual-functionality. Furthermore, the development of personalized online learning which reflects different learning styles will face the problem of resources deficiency. This will restrain functionality innovation in e-Learning, which will further detain the emerging of relationship innovation.

The innovation landscape of the current e-Learning activities falling into determines the present environment for innovation endeavors. It also defines the dynamics of innovation efforts occurring in the near future. The framework of innovation trinity suggests that after delivery dominated innovation or incremental innovation, the innovation stage will shift to restructure innovation, in which both delivery and relationship innovations will play an important role, while function innovation is still comparatively weak (Lan 2009, 2010, 2013). Applying the dynamics to e-Learning, it suggests that innovation may expand in two frontiers. One is to diminish the gap between online courses and face-to-face courses by improving the delivery. The other is to innovate more in e-Learning business models. It may involve finding new sponsors, stakeholders, or new users. The most possible direction is to engage employers innovatively, and enable them to be an active stakeholder instead of a passive stakeholder. It is expected that (1) “hands on” portion of online courses becomes a bridge to link different stakeholders; (2) more practical and useful small programs show as promising e-Learning niches which have different employer-student relationship; (3) the role of instructors will shift to learning facilitators from knowledge distributors with more involvement in real world applications. In short, various models which focus on diminishing the gap between self-learning and real world application will be thriving.

This study combines surveys and concept development. It not only provides a snapshot of the current e-Learning practices, but also predicts the possible development of e-Learning innovation in the near future. During the study, first hand data collection and analysis are paralleled with the examination of secondary information; introduction of the concept of innovation trinity is exemplified in education industry. While the study shed lights on the e-Learning area, it does show some shortcomings. Firstly, the surveys concentrated only on students, and instructors and employers were not included. Since instructors and employers are important stakeholders in the industry, their concerns and requirements have to be fully examined. Secondly, the surveys concentrated on students who have entered the field of e-Learning, and the opinions of other students on e-Learning are not covered. It is apparent that only those missing parts are included, a comprehensive picture about e-Learning could emerge. The limitations of this study and the trend revealed in the research definitely point out the venue for future study.

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