The Valuation of Learning Methodology: Costs, Delivery, and Efficacy

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The purpose of this paper is to explore the relationship between education delivery methods, costs, and efficacy.   There are various methods used to deliver training and education, and each method has different costs. The choice of delivery method can affect the both the cost and quality of the learning experience. Looking at the variables of common learning methods and models, it is apparent that online delivery provides the best education value at the least cost. Online delivery is both cost and learning efficient.

Types of Delivery Methods

In training and education, there are a number of delivery methods used to facilitate learning. Traditionally, children and adults have been taught classroom-style. Since the advent of the internet, there are now more options for training delivery. Distance or online learning can be synchronous, where the instructor interacts with the student in real time, or asynchronous, where the student-teacher interaction can happen anytime, anywhere; in this training mode, communication is static. Synchronous online learning can be thought of as e-teaching, in that it is led by a facilitator or instructor. In asynchronous learning, the learner directs the pace of the training from their end (Woodill, 2004).   Many colleges and universities now have distance learning options that include this type of learning opportunities.   ELearning, on the other hand, consists of education that is unidirectional, with no interaction between instructor and student. The learning derives from the student's interaction with the computer program.   In the case of self-paced eLearning, it is as if the instructor has been left out of the education equation.

Interactivity, Optimum Ratios and Learning Success

Within the delivery options mentioned, there are different levels of interactivity. Level of interactivity is one of the measures used to evaluate the quality of the training experience. In classroom learning, small class size has been thought to increase student success due to the high level of interactivity between student and teacher. A study conducted by Anymir Orellana of Nova Southeaster University concluded that most students consider their online courses highly interactive, and that the higher levels of interactivity were due to smaller class size (Orellana, 2006).

The optimum student to instructor ratio varies based on a number of factors. Course design, subject matter, and delivery method all impact the optimum ratio of student-to-teacher, student-to student, and level of overall interactivity. A classroom-based course designed with activities that involve student-to-student interactivity and group activities need at least a certain number of participants to be effective. In this case, too few or too many students could affect the success of the course.

Course topic can also help to determine the most appropriate delivery method. Certain subjects such as leadership development training, need high levels of student-to-student and student-to-instructor interactivity, therefore do not lend themselves to asynchronous e-learning delivery methods, and are better taught in a classroom environment. For example, a continuing education credit course for healthcare professionals would not necessitate instructor-to-student interaction; therefore, it is well suited for a self-paced e-learning course design.

The delivery method best suited for the maximum amount learning to occur must take into account subject matter, audience size, audience location, and program budget. Classroom

delivery may be the best choice in certain instances for particular topics, but classroom learning can be very expensive for a large, geographically disbursed audience. There are facility costs, travel expenses, instructor salaries, and opportunity costs to consider. Opportunity costs are expenses that are incurred as a result of an employee's absence, such as the salary that must be paid to cover their shift while they are in training (Ndon, 2010).

Many subject areas lend themselves well to web-based, real time distance delivery. Software training is an excellent example of the type of subject that is well suited for delivery via the web. Online learning is both a cost and learning effective method to train this type of subject matter to geographically disbursed audiences. It is important to keep the audience size manageable to increase opportunities for interaction between instructor and student and among the students themselves.

Self-paced eLearning can be ideal for certain topics. Asynchronous eLearning can have a very low cost per learner and the cost per student gets even lower as the number of students increases. Once self-paced courses are designed and developed, they can be delivered an unlimited amount of times to an unlimited number of students anywhere and anytime, making it particularly cost-effective.

Measuring the Value of Learning Experience

How do we measure the value of a learning experience? One needs to consider both whether the learning objectives are met and the cost of the learning experience. The value of a course or program can be determined by comparing the costs of developing and delivering a classroom-based course, a distance online instructor-led course (e-teaching), and an e –learning course.

Classroom training costs typically include: use of the facility and equipment, instructor time (classroom and pre/debrief), travel costs (either of the instructor or the participants), design and development cost, opportunity costs, and materials. An equation can be used to determine to the cost of developing instructor-led courses.   According to Bryan Chapman, a noted expert on instructional design, it cost approximately 36 hours of design and development time to create one hour of instructor-led training (Chapman, 2011).

Chapman breaks this rubric down further to include analysis, instructional design, PowerPoint slides, lesson plans, student guides, tests/exams, and handouts.   He assumes a per hour salary rate of $50, with a burden (usually 20%) to equal a total of $80 per hour.   Using the $50 rate of 2007, the cost to create one hour of instructor-led training is $2,880 (Chapman, 2011).

Brandon-Hall, an e-learning consulting firm, estimates a two to one ratio of development of eLearning to instructor-led. These estimates will fluctuate with the type and complexity of the eLearning developed (Hall, 2000).

Paul Walliker has developed a mathematical model that compares the cost of instructor-led training to eLearning.   In his model, Walliker has taken all the major cost factors into account in his comparison model, including lesson design and development, teacher compensation, student materials, travel, facility use, and opportunity costs.   He has also developed an accompanying user-friendly Excel spreadsheet for calculating and comparing both direct and indirect program costs of eLearning and classroom learning.   This spreadsheet can be used as a tool to help designers make informed choices regarding delivery options.   The user enters the development variables into the corresponding cells and the spreadsheet calculates the

costs. Walliker's spreadsheet provides options for 2-hour and 4-hour courses, an option for cost per learner, and a return on investment coefficient (Walliker, 2007) .

During the course of developing his model, Walliker became aware that eLearning is the more cost effective solution when equivalent courses are compared. In cases where the number of students exceeds 100, the savings can be exponential (Walliker, 2007).

Online learning provides more opportunities for learning than traditional methods. There are more resources, more online programs, and more informal learning available to more learners. Many colleges and university offer programs online. Webinars, online courses and educational blogs are just a few options now available. There are more opportunities for just-in-time learning experiences, as information can be accessed when it is most needed. More varieties of learning experiences offer more opportunities to learners with varying learning styles. There are more opportunities for individuation and customization. Many types of disabled persons can now access information and education that was previously not available to them. Online learning provides more feedback mechanisms and remediation options than traditional classrooms offer (US Department of Education, 2012).

ELearning has an added benefit of leveragability. One self-paced eLearning course can be delivered at the same cost to one or one million learners. It also has the advantage of what Walliker terms "velocity", meaning that many learners can take the course simultaneously, rather than over the period of weeks or months that it would take to deliver an instructor-led course. For example, an eLearning course becomes a tremendous advantage over an instructor-led course when a company is rolling out a new product, as all employees who need immediate knowledge of the new product can access it as soon as the course is implemented (Walliker, 2007).

The Optimal Number of Participants for Effective Learning

What is the optimal number of students needed to create an effective learning experience? In classroom training, the student teacher ratio is an important variable in the learning experience. If there are too many students per instructor there is insufficient interaction for optimum learning, and too few students limit the options for student-to-student interaction or for group learning to take place.

Success of distance E-teaching is also affected by instructor-student ratios. When delivering distance classes, there are added modalities that require a high level of concentration on the part of the instructor. For example, in many online webinars, the students and teacher can hear each other but not see each other. In this scenario, the instructor must make an extra effort to interact with all the students in the class. If there are more than 7-10 students, it is difficult for the instructor to keep track of who is participating and provide relevant feedback and accurate responses.

On the other hand, a self-paced eLearning course can be taken by a myriad of different users for a one-time development cost. ELearning courses also have the advantage of allowing a student to go back and review information that they may have not understood the first time through the course.

Evaluating the Effectiveness of the Learning Experience

There are a number of different ways to determine success of a learning event. Participant reactions are a way to gauge how a student feels about a class. Unfortunately, student evaluations are an entirely subjective measure of learning and therefore are not reliable indicators of learning success. Test/exam scores are relatively reliable indicators that learning

has occurred.   If courses are well designed and test questions are developed using criterion-referenced test objectives, then the results can be considered reliable.   Competency assessments are another method to help determine if the learning objectives of a course are met.   Observing workers while performing job tasks covered in the course provides supportive evidence that the objectives of the learning have been achieved.

Conclusion: More Research Needed

It is challenging task to quantify the productivity of education. Does the addition of distance, online, and eLearning to instructional methodology increase the chances for more effective education? Undoubtedly, internet-based education does allow for much more access to learning opportunities. The existing literature and studies done on this subject seem to say so. They also indicate that eLearning is in its infancy and much more research on the subject is needed to reach accurate conclusions regarding its efficacy. There are many variables in the online learning equation that are difficult to quantify and we are still learning.

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