Technology-based Employee Training:

Comparing Traditional and Technology-based Methods of Employee Training

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## Introduction

In today's economy, for a company to stay relevant, they must continue to get better at what they do. This means that training new employees and continued training for existing employees is a must (Wadors, P., 2016). Advanced training allows an overall strengthening of the team by increasing their level of performance, allowing employees to work with less supervision, without relying on constant help from others. In addition, it helps the employee think of new and innovative ideas that may make products, processes and procedures, safer, more reliable and more efficient, while giving them stronger job satisfaction (Frost, S., 2018).

However, training for a company can be a great expense (G. Y., 2015) that many can't afford to pay on an on-going basis. To add to the burden of cost, there is the lost production time of employees spent on training. Whether they are taking or teaching a traditional class, it takes time away from the job they were hired for. To make matters worse, depending on the material, there may not be anyone in house that has the necessary expertise to even tackle the needed training. This can make training inconsistent and even more expensive (G. Y., 2015).

Additionally, given the fact that in the workplace employees have varying degrees of academic ability, as well as varying education levels, cultural differences and work experiences to draw from, they will learn a given amount of material at different rates. Some employees may require prerequisite knowledge, while others have a wealth of experience and background knowledge in a given area and therefore need less time to cover the material.  Because of these differences between employees, the traditional method of classroom instruction can be ineffective.

What companies and employees need, is a delivery method that will address the issues of learning diversity among employees while addressing the high cost of training.

In this paper I will use the accompanying research to determine how a technology-based interactive learning method will address both of these issues.

## Literature Review

When it comes to training people in the workplace, the choice between a technology-based interactive learning method and face-to-face learning both have pros and cons. According to the literature reviewed, a technology-based interactive learning method, appears to be the most beneficial. Even so, there are limitations and considerations that the literature addresses where technology-based learning is concerned. In the following literature review, we explore some of the issues of traditional learning and some of the considerations that need to be addressed with a technology-based interactive learning method for it to be successful, as well as the benefits that a technology-based interactive learning method seems to have over traditional instruction.

 The following article summaries attempt to demonstrate the higher value of technology-based learning to both the company and the employee being trained, while addressing some of the flaws that could make it less beneficial if these potential flaws are not addressed.

The failings of the traditional methods of learning were pointed out in the following research article that focuses on the curriculums of Science, Technology, Engineering and Math or "STEM" courses to make its point. The authors attempt to reinforce the inadequacies of traditional lecture courses compared to courses that depend heavily on active learning through technology to present the same material, while using statistics to back up these claims. They state

that students in traditional lecture courses in these fields are 1.5 times more likely to fail while students ranked in the 50th percentile of a class would move the 68th using active learning in the place of traditional instructor lecture courses. Additionally, the article also makes the point that both female students and students from disadvantaged backgrounds seem to benefit a great deal more from using active learning in these mainly male dominated fields (Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P.,2014). There is however, a failure to determine if the advantage over traditional lecture instruction is from technology or simply based on general active learning techniques. It does make clear however, that the one-way transfer of information is inferior to student interaction, which may or may not be leveraged with technology (McDonough et al., 2014).

There can however, be issues with a technology-based interactive learning method as well. The point is made, that for a technology-based program to be of genuine value, it needs to be developed to meet the goals of the program rather than simply trying to make an existing program fit a need it is incompatible for. The objectives for the learners involved need to be carefully considered and tools chosen that support those objectives by examining the advantages and limitations of those tools (MacDonald, C. J., Stodel, E. J., Farres, L. G., Breithaupt, K., & Gabriel, M. A., 2001).

Also, there are different factors of technology-based learning, that we must understand for it to be effective. These factors include: Multimedia integration, knowledge acquisition in a Just-in-time format, interactivity, flexibility and intelligence (Zhang, D., Zhao, J. L., Zhou, L., & Nunamaker Jr, J. F., 2004). If the correct technology-based program is not developed for specific goals and the above factors are not considered, it will be no more effective than a traditional approach to learning.

Some of the benefits of a technology-based interactive learning method that includes multimedia are explained in the following research dealing with the effect of emotion on learning.

The correlation between emotions and learning are researched and how multimedia technology can improve the emotions of the learner. The findings of the article suggest that emotions involved in learning enhance the ability to learn in a variety of ways. Emotions are tied to the ability to process information during the learning process as well as affecting other process such as communication, negotiation, decision making, sorting ability and problem solving.

Positive emotions affect the ability to learn as demonstrated by comprehension test and positive emotions can be brought about with quality of design and presentation of the learning material. Several studies outlined in the text were found to indicate that positive emotions / mood was produced by multimedia design elements that were introduced into the presented material (Um, E., Plass, J. L., Hayward, E. O., & Homer, B. D., 2012). In essence, adding visual element such as multimedia into a technology-based interactive learning method improves the ability to learn.

Additionally, according to *American Journal of Distance Education,* two experiments were conducted to evaluate the effectiveness of interactive learning compared to the more traditional method of classroom learning. The interactive technology-based group had higher levels of satisfaction and performed at higher levels (as indicated by higher test scores) than did the students using the traditional delivery method of the classroom (Zhang, D., 2005).

The advantages that the students got from the technology environment was instruction that was equivalent to that of a traditional classroom, except for immediate feedback from the

instructor. The students could however, learn at their own pace and skip or repeat parts of the material as needed (Zhang, D., 2005).

An additional conclusion was that a user interface that was both straightforward and could be used easily, helped to lead to the better results (Zhang, D., 2005).

More of the benefits of multimedia learning that makes it preferable to face-to-face learning are outlined by Skinner, C. H., Fletcher, P. A., & Henington, C. (1996). This article centers around the basic concepts of improving retention of material by students and how technology may be able to play a role in improving learning. This article states that learning can be improved by a) increasing the number of repetitions that the material is covered over a fixed amount of time or b) by improving the quality of the material so that retention is easier or c) by increasing the amount of time a student has to cover the material. Increasing time allowed to cover the material is not usually a feasible option due to the constraints of other activities. However, with the aid of technology, material can be interactive to allow self-evaluation while also being visually stimulating (improving the materials quality). With self-evaluation, immediate feedback is given for a response allowing the student to reinforce only correct information and may also allow for more repetition in the student's weaker areas within the material.

More research by Piccoli, G., Ahmad, R., & Ives, B. (2001) outlines the many benefits that learning environments that are technology based have over traditional classroom instruction. Research as far back as 1994 suggest that a learning environment mediated through technology may improve student's achievement. There are several factors that bring this about. The students attitude towards learning as well as how they evaluate the learning experience. Technology based learning may also improve or increase the interaction that students can have with the teacher.

One student can't monopolize the class or the teacher / instructor's attention; making a more student-centered environment.

This concept is also brought out again in 2002 in an article by Benbunan-Finch, that focuses not only the delivery of content, but also on the communication between the teacher and the student. It goes on to bring out the point that not only is the teacher-student relationship improved but that the student may also have access to collaborate with other experts, peers and students to gain additional information on a topic, all without any hinderance brought on by geographical restrictions (Benbunan-Fich, R., 2002).

Further, Piccoli, Ahmad and Ives continue by saying technology-based learning environments have the ability to keep material current as well as breaking down geographical barriers that traditional classrooms create. The convenience a technology-based program provides also leads to student retention. Additionally, the differences of time needed for a student in a course is easily achieved in the virtual learning environment that is impossible in a traditional classroom environment. Through the implementation of technology there is greater learner control which leads to better measurable performance.

Even though the literature, as a whole, overwhelmingly supports technology-based learning, there are still concerns surrounding this method. In the following article, author Donald Clark explores these concerns, or "myths" as he calls them.

For instance, the myth that it is just another delivery method of learning material, when in fact it makes us address fundamental issues around the phycology of learning.

The myths that e-learning isn't as effective as traditional learning or that it takes the same amount of time. This article explains that the retention rate is higher due to it being self-paced,

which is why it doesn't necessarily take as long; students don't have to wait for others to catch up or the class doesn't have to be slowed down to accommodate the slower students.

Another myth is that e-learning can't accommodate different types of learners, when in reality a traditional class environment will only hit a small section of the class. This is because there are varying degrees of motivation, different backgrounds and skill levels as well as personality types in every class, but everyone gets the same pace and possibly no prerequisite instruction as they can with e-learning (Clark, D., 2002).

As the research shows, the benefits of a technology-based interactive learning method far exceed that of traditional classroom methods. However, when using technology-based programs of training, care must be taken to insure the type of information being taught is suited for the delivery program and that it is designed in such a way as to engage the learner to be effective.

## Discussion

The purpose of this paper is to determine the best solution for training employees in the workplace; technology-based remote learning or traditional instructor-based classroom lecture. To do this, we must first take a candid look at both of these methods of instruction to examine both the shortfalls and advantages of each.

Shortfalls of instructor-based training

In a traditional classroom setting, a group of individuals are usually assigned a class based on the need of the organization (epically in a work environment) without regard to their interest or motivations. Because of this, a typical class is made up of a variety of people. People

with different aptitudes, personalities, motivations and experiences to draw from. Yet, with all these differences, the instructor can only move the class at one pace, using one lesson plan. They often only reach a small part of the class (Clark, D., 2002). If the class is too fast, some will fall behind and not grasp the material needed for them to perform their job at the highest level. Going to slow on the other hand, not only takes more time than may be available, but also lets the class go to slow for the faster students that need to be challenged. This circumstance results in these faster students becoming less engaged as the class goes on (Reeves, T. C., & Reeves, P. M., 1997).

Of course, that is not to say that once a company adopts the philosophy of having a technology-based training program that it will meet their need either. To be affective there are some considerations that must be made.

Shortfalls of technology-based training

Simply adding a video to your training, for example videoing a lecture, would add very little benefit to the training process. It could provide some convenience, that could help improve learning, but is less effective if the student wanted to ask questions or find a particular topic within the lecture material. There are considerations that should be made in order to make technology-based training an effective method for any company. For example, consideration such as multimedia integration - how and how much, interactivity - what level is appropriate for the material being taught, using a just-in-time format to break the material into smaller chunks. These are some of the questions that must be answered when designing a technology-based training program to eliminate the shortfalls (Zhang et al., 2004).

In another article written by Zhang in 2005, for *The American Journal of Distance Education*, he mentions two experiments that were done to evaluate the effectiveness of technology-based learning. The interactive technology-based group had higher levels of satisfaction and had higher test scores than those students using the traditional classroom delivery method. The only drawback mentioned was that students did not have immediate feedback from the instructor, but the overall advantages that students got from a technology-based learning program was equivalent to that of a traditional classroom. (Zhang, D., 2005).

From Zhang's findings we begin to see that while there are some shortcomings to a technology-based learning program, the benefits exceed those of the traditional method.

Advantages of a Technology-based Training System

One of the preconceptions is that technology-based training is just another method of delivery of learning material, when in fact, the retention rate is higher due, in part, to its being self-paced, while being flexible enough to accommodate different types of learners (Clark, D., 2002). By being a self-paced delivery system, the time allowed to cover the material is increased as needed, which addresses one of the major flaws with the traditional delivery system of not adjusting the time for lower aptitude students (Reeves, T. C., & Reeves, P. M., 1997).

One of the less obvious benefits of technology-based learning was brought out in research done surrounding the relationship between emotions and learning in the *Journal of Education Psychology,* which indicates that when multimedia design elements are introduced into presented material, there is a rise in positive emotions. The article goes on to indicate that positive emotions are tied to the ability to process information during learning as demonstrated by comprehensive test (Um et al., 2012).

Another factor that helps increase learning with a technology-based method, is that this method may increase interaction between the student and teacher (Piccoli et al, 2001). According to an article written in 2002, *Improving education and training with IT* (Benbunan-Finch), states that not only is the teacher-student relationship improved with technology-based learning, but it also gives the student access to collaborate with other experts and peers for additional information on a topic, without the restrictions of geographical boundaries.

When the curriculums of Science, Technology, Engineering and Math (STEM) courses were used to evaluate the effectiveness of traditional classroom delivery in comparison to active learning delivery methods in 2014, the finding indicated that students were one and one-half time more likely to fail using the traditional delivery system than when using the active based learning method. The findings also suggest that when female or disadvantaged students were involved in these programs, these students benefited a great deal more from using the active learning system (Freeman et al., 2014). The point here is that even though active learning can be achieved without technology, it contrasts greatly from lecture style teaching. Active learning can however, be incorporated and deployed easily with a technology-based delivery method.

Conclusion

According to the research referenced in this paper, findings indicate that the most effective method for companies to use in training employees is a well-organized technology-based delivery method that is customized to fit the material that is being delivered, with regard being made to the type of learners that will be using this delivery method. This provides for learning diversity among employees.

Taking advantage of advances in technology we can create an environment that is more interactive and creates feedback that can be both immediate and delayed, while giving the student more time to work on needed topics.

While this helps employees learn, there are also some significant advantages to be realized by the companies or organizations that implements these programs.

These organizations don't have to provide a trainer for each class to be presented and can also update course information easily. This could may give them financial and competitive advantages by having a well-trained workforce; making the overall team stronger all while keeping training cost down.

The research strongly suggests that the issues that were brought to light in the original discussion of this paper concerning the problems of workplace training, are dealt with by using a well-suited technology-based delivery teaching method for employees.

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