

"New Teaching for a New Generation: Online Video Technology"

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Abstract

It is a primary goal in higher education to provide a high-quality learning experience for all students. However, changing times have created a need to alter educational methods in order to meet ever increasing financial and personnel constraints as well as attune to the individual abilities and learning styles of students. Thankfully, evolving technology has provided a way to meet these needs. Media-rich instructional methods offer multiple benefits for instructors and students alike in a low-cost, low-effort way of increasing the quality and quantity of instruction. This paper will discuss specifically the utilization of online video technology. Specific examples for integrating video with other computer programs and its use in automated courses are reviewed. Furthermore, we will discuss how video teaching is an instructional technique of choice for today's technologically advanced generation of students and how it provides a user-friendly, duplicable means of helping instructors teach methodological processes without repetitious instruction.

Introduction

A new generation has entered our world and our universities. The modern generation understands and utilizes technology like no other group before them, and their learning styles have evolved to match the fast pace of this advanced world. Because most university faculty were educated via the chalkboard, the idea of using technology as an educational tool requires a paradigm shift. Instead of shying away from new things that at first may seem overwhelming, it is important that today's teachers embrace the new tools available to them for the benefit of both the students and themselves. Indeed, recent technology can have as many benefits for the teachers as it does for the learners.

Technological advances have created means of teaching that can save much time and effort for professors, as well as better meet the needs of the students. Industrial companies like Solid Works and Edge Cam have seen the benefits of the latest technologies, and are currently using it in training courses. After attending training with these companies and witnessing first hand the impressive nature of new video technology, specifically a program called Camtasia, I began to research it, learn it, and use it in the past year. The following paper will discuss Camtasia and how to use it, how to integrate it with other media and software, how it can benefit students and professors alike.

The Technology and How to Use It

Camtasia is a software program that creates professional-looking videos from a PC. It records and creates full-motion video tutorials or presentations in real-time. Then the created file can be published in almost any format.¹ In other words, it is possible to combine videos, still pictures, lectures, demonstrations, Power Point presentations, automated evaluation instruments, and many other teaching tools onto one interactive video for student use. The program has a relatively low cost and requires much less effort than one might imagine in seeing the quality work that is produced. Because the training is straightforward and readily available online, it is not necessary for users to have prior multimedia or programming experience. Moreover, no studio or traditional specialized recording equipment is needed. All that is necessary is the video software and whatever tools are needed to create the components desired for inclusion such as a digital camera for still pictures, a digital video camera for video, a microphone for voice recordings, and/or whatever other means one might want to use. A computer with a fairly large memory is helpful for speed in recording, editing, and publishing.

Video technology such as Camtasia is wide and varied in its usages. One can teach specific procedures, multi-step processes, complicated information, and other scientific work. It can be successfully integrated with CAD and CAM programs as student learn design and manufacturing. One can take his/her own digital still pictures and videos and record them into the program to show specific objects, details, or processes. Audio can be added in the form of one's own voice recordings or other sound.

For example, in a computer integrated manufacturing course, I recorded audio and Power Point notes about how to operate computer drawing programs. I integrated the drawing program itself into the file and the students could watch how to do the program directly. Camtasia would highlight my keystrokes and cursor movements to show how to operate the program. I also took still pictures of the part that was being drawn and placed it as part of the file. I also video-recorded and included how to load the program into the machine and actually operate the machine to create the part. I recorded my own voice teaching to explain all these processes.

Once the file is complete, publishing it for student use is the next step. The file can be placed on CD and played on standard Windows media player software or on Camtasia's own player software. The files can be published online, on real stream servers, or on Blackboard for students to watch and/or download. In these online methods, it is possible to monitor individual student access and conduct interactive evaluation.

For example, I put the computer integrated manufacturing course file described above on the university Blackboard system. I would upload the day's notes prior to the class, and then teach on the topic but refer them to the file for more information. Later I could access the file and see which of the students had actually logged onto the system and looked at the file.

The Benefits to Students

The video technology described is a method of choice for teaching today's students. It is consistent with the way they interact with the world and it meets their individual learning needs. It is helpful, even essential, in understanding complicated material.

Students are technologically advanced and able to understand this type of teaching. Indeed they have had toys from infancy that flash lights and make noise. In their spare time they play video games and explore the world online. This way of living, this mind set, has not only made them more capable of understanding technology, but has also led them to expect and need to be taught in a way that matches their world.

Moreover, the educational world has known for years that learners have different learning styles which dictate how they best learn. And yet, we continue to lecture and expect that they all understand, but actually knowing with some confidence that only the auditory learners will "get it" while the kinetic and visual learners will have to catch on somehow on their own. Interactive video technology alone, and especially when combined with traditional teaching and hands-on laboratory experiences, provides the means for all types of learners to learn. The auditory learners hear the material, the visual ones get to see it, and the kinetic learners are allowed to interact with the program and actually do it.

Online video teaching also allows for students to see the material over and over without someone having to explain it again and again. Some students may need to hear the material only once while others need to see it several times. By having this technology available to match their learning styles and needs, the level of ultimate understanding among all students is increased. Skill level differences that used to be large are evened out as students are able to learn in their own individual way using the tools made available to them.

Furthermore, if a student misses a class, the professor does not have to go over the entire lecture again, nor does the student invariably fall behind. They simply watch the video online and catch up.

In my personal experience in teaching computer integrated manufacturing, I saw a great deal of difference between when I taught the course with and without video technology. Without video technology students constantly complained that the processes were too difficult and complicated. They continually asked for repeat teaching of material covered in the past, they could not keep up with the number of steps, and they could not satisfactorily complete assignments. If they missed a class even for a valid reason, it was very hard to catch up, almost to the point of failure, unless they came to my office for an entire repeat of the lecture which was difficult for me and something most students were unwilling to do.

However, with video technology, the course proceeded much differently. Students were able to stay abreast of the material and complete assignments. It was still a difficult course, but with the availability of video technology for them to utilize self-teaching along with regular class

and lab time, most students were able to conquer the material and leave the course with good understanding and good grades.

The Benefits to Professors

As mentioned earlier, it requires a paradigm shift for many teachers to move beyond a traditional lecture-based teaching method. While the classroom lecture and personal interaction with students is still vital to the learning process, the utilization of video technology greatly enhances the transfer of knowledge. It has been shown that video teaching provides many benefits for students, but it also provides many benefits for professors as well. Interaction during class and lab time is improved when students are better prepared, repeat instruction is not necessary, and schedules are more easily maintained. Once the initial work in creating the video file is done, preparation for future offerings of a course is minimal. Furthermore, it is easier to assess student effort.

By offering course notes and demonstrations online via video technology, students can prepare and learn prior to class or lab time. They come to class/lab armed with better questions and a greater knowledge base on which to build. Class and lab time is spent in real teaching/learning rather than remediation. All students benefit from the direct interaction time rather than spending excessive amounts of energy on helping the slower learners while the brighter ones get bored, or in another instance, teaching the brighter ones while the slower ones fall behind.

If the professor stays firm in requiring that students come to class having watched the day's video files, they quickly accustom themselves to the system and utilize the tools available to them. Once the format is established, students put peer pressure on each other to "watch the files" as they become exasperated with those who do not prepare ahead of time.

Repetitive teaching is minimized or avoided altogether with the use of video technology. Multi-step processes are easily taught by referring students to the video file for repeat instruction. Missed classes or just a plain lack of understanding are remedied by the utilization of the video files. Furthermore, a class schedule is more easily maintained when repetitive teaching is avoided. It is much less likely to finish a semester having covered only half of the intended material. Class can even progress in the absence of the professor if he/she has to be gone for a conference or last minute interruption.

While the initial investment of time in the creation of the video file may seem somewhat tedious, the end result of saved time will more than make up for it. Once the file is done, it can be updated as needed, but the pictures, videos, notes, demonstrations, and other components will likely be relevant to a course for years to come. Future preparation and planning is minimized. Additionally, students are able to download and print their own notes thereby saving professors the time and universities the money in making photocopies.

Finally, when using video technology with a program such as Blackboard, it is possible to insert interactive evaluation instruments and monitor individual student access. The file can

require a student to log in, answer questions, grade the answers, and give the professor and student instant feedback about his/her performance. The file can also record which students have logged in and watched a file, and how many times they have watched it, so that professors know which students are putting effort into their study of the material.

Summary

Video teaching is the way of future education. It matches student learning needs and eases the efforts of professors. While the idea of creating video teaching files may seem overwhelming, Camtasia has made it relatively easy and inexpensive to make professional-appearing videos that greatly enhance student learning and maximize a professor's time and effort. It is the solution to the increasing constraints of time, lack of support staff, and the ever-present need to address student learning styles. Online video teaching technology is indeed the way to teach the new generation.

Bibliography

1. www.techsmith.com

Biographical Information

WARREN LEWIS received a Master of Science degree in Manufacturing Engineering Technology from the University of Southern Mississippi in 1994. He has been an Assistant Professor for Oklahoma State University since 2001 teaching courses in manufacturing processes, industrial materials, physical metallurgy, tool design, and computer integrated manufacturing. Prior to this position he served as a Manufacturing Engineer for The Charles Machine Works, Inc. (Ditch Witch) in Perry, Oklahoma.