Tutorial Videos in CAED for Slow Learners

C. M. Koti
Professor, Department of Mechanical Engineering,
B. V. Bhoomaraddi College of Engineering and Technology
Vidyanagar, Hubli 580031, Karnataka, India
cm_koti@bvb.edu

Sanjeev. M. Kavale
Lecturer, Department of Mechanical Engineering,
B. V. Bhoomaraddi College of Engineering and Technology
Vidyanagar, Hubli 580031, Karnataka, India
sanjeev_kavale@bvb.edu

Suresh. H. K
Asst Professor, Department of Mechanical Engineering,
B. V. Bhoomaraddi College of Engineering and Technology
Vidyanagar, Hubli 580031, Karnataka, India
suresh_hk@bvb.edu

Shreeshail. M. L
Asst Professor, Department of Mechanical Engineering,
B. V. Bhoomaraddi College of Engineering and Technology
Vidyanagar, Hubli 580031, Karnataka, India
shreeshail_ml@bvb.edu

Gurupadayya. M. Hiremath
Asst Professor, Department of Mechanical Engineering,
B. V. Bhoomaraddi College of Engineering and Technology
Vidyanagar, Hubli 580031, Karnataka, India
gurupadayya@bvb.edu

***Abstract*— Engineering Drawing is a language. Engineers all over the world communicate their ideas of products through this language. There have been rapid changes in the method of teaching in respect of tools and class room practices. New tools have been introduced to make the drawing process faster and easier. Also new methods of teaching have been introduced at various levels to make the teaching learning process enjoyable and more effective. But all these methods were limited only to the class room teaching. The course instructors were confronted with the problem of teaching slow learners. In order to address this problem a new method of teaching slow learners outside the class room by providing tutorial videos has been tried. This paper deals with the experience of making tutorial videos and their impact on the performance of students.**

Keywords— Engineering Drawing, Tutorial Videos.

I. INTRODUCTION

Engineering Drawing is a language. Engineers all over the world communicate their ideas of products through this language. There have been rapid changes in the method of teaching in respect of tools and class room practices. New tools have been introduced to make the drawing process faster and easier. Also new methods of teaching have been introduced at various levels to make the teaching learning process enjoyable and more effective. But all these methods were limited only to the class room teaching.

Teaching CAED (Computer Aided Engineering Drawing) is totally different from teaching any other subject. When teaching a theoretical subject the teacher will not come to know the level of understanding of the subject taught in a class till a test either in the form of quiz or exam is conducted to that effect. In CAED the understanding of the subject by the students is realized by the teacher immediately when the student starts solving the problem after the instructions. Students in a class can be broadly classified into three categories, bright students, average students and slow learners. Bright and average students grasp the subject quickly, may be at the first or second instance of instructions given by the teacher. Whereas slow learners need more time to grasp and need lot of hand holding during teaching of Computer Aided Engineering Drawing (CAED). This is where a teacher faces the problem. He has to complete the course at the same time take all the students along with him. If the course instructor tries to take the slow learners along with rest of the students then he will not be able to complete the course within stipulated time. However he cannot leave the slow learners unattended and some provision must be made for the slow learners to learn the subject in their own pace.

The concept of tutorial videos has been tried to address this problem. The book and multimedia DVD by Toogood and Zecher [1] is the inspiration for the proposed work. Also the work done by Choi and Johnson [2] suggest that rather than text books, videos play better role in understanding of concepts.

II. IMPLEMENTATION

A. Methods of making tutorial videos

There are various methods of making tutorial videos. If one tries to make tutorial videos using an ordinary movie camera and a microphone, normally either the video quality or the audio quality or in some cases both are poor. It is advisable to use a screen capturing software along with a USB microphone for making tutorial videos. One can always refer to guidelines given by Koumi [3].

B. Selection of software

There are many screen capturing software, some of them are freeware or demo versions and some are full-fledged licensed versions. With proper planning one can always use a freeware or a demo version to make fairly good tutorial videos. The authors used a demo version of software, Screencast-O-Matic in preparing the tutorial videos. This software has a recording time limit of 15 minutes for demo version. The authors found that duration of 15 minutes recording is quite adequate for recording a solution to a problem in CAED. However if one needs a longer duration the videos can be made in segments.

C. Planning and naming of videos

The videos have been sequenced in the same order in which the problems appear in the course delivery plan. They start with the simplest problem and the complexity increases as one progress through the videos. The naming of videos is in accordance with course delivery plan e.g., CH4_S2_2_3D.mp4, means second problem from session 2 of chapter no 4 which is in mp4 format. The student can easily correlate the videos with course delivery plan.

D. Recording of videos

The recording of videos needs a lot of preparation. As far as possible one must write a script and rehearse before starting recording. Recording must be done in a noiseless environment preferably with an USB microphone. The authors took all possible precautions to avoid noise and most of the tutorials have been recorded during night. If one has access to a recording studio it is advisable to use it. The videos have been recorded in mp4 format which can be played on the tablets which are available to all the students.

E. Distribution of Videos

The videos thus created were given to all students. Students put those videos on their tablets and watched them while practising. Videos with proper audio narration can create virtual classroom wherever and whenever student wants to learn.

III. CONCLUSION

The sample videos have been played in the classes and the students have been advised to use them for faster learning. At the end of the semester a feedback survey has been conducted and the figure 2 shows the opinions of the students in percentage.

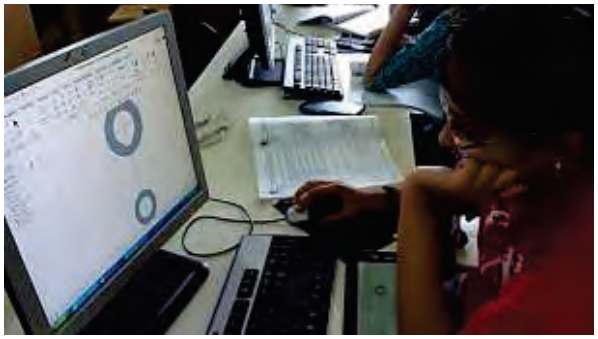

Fig. 1. Student watching a tutorial video

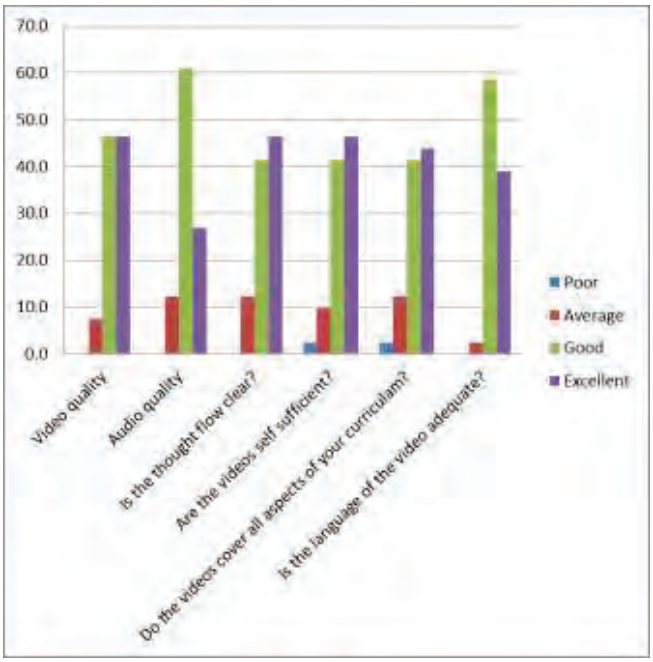

Fig. 2. Opinion of students for various questions in percentage.

Figure 3 shows the opinion of the students for the question: "Were you benefited by the tutorial videos?" in percentage.

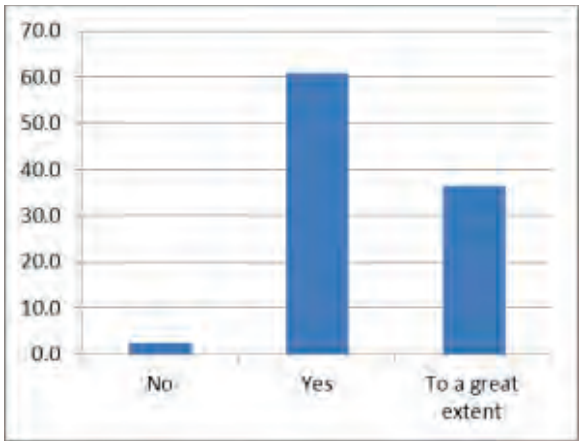

Fig. 3. Were you benefitted by the tutorial videos?

Figure 4 shows the opinion of the students for the question: "Will you recommend the videos to your friends learning this course?" in percentage.

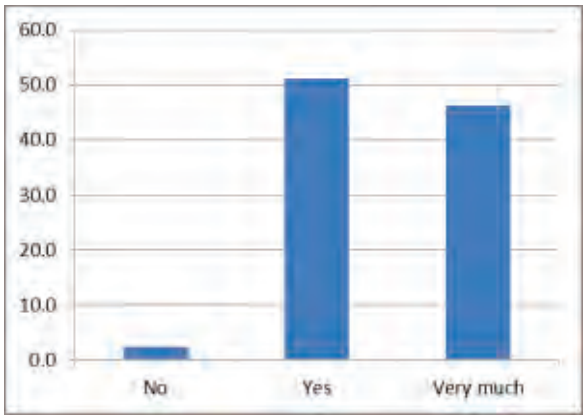

Fig. 4. Will you recommend the videos to your friends learning this course?

Some of the teachers who were to teach the subject for the first time also have used these tutorial videos to learn it faster and have expressed their satisfaction and feedback given by one of them is shown in figure 5.

Not all students will be able to learn while the teacher is teaching in the class. Some may require repeated observation only with which will be able develop skill of Engineering Drawing. For such students these videos were of considerable help.

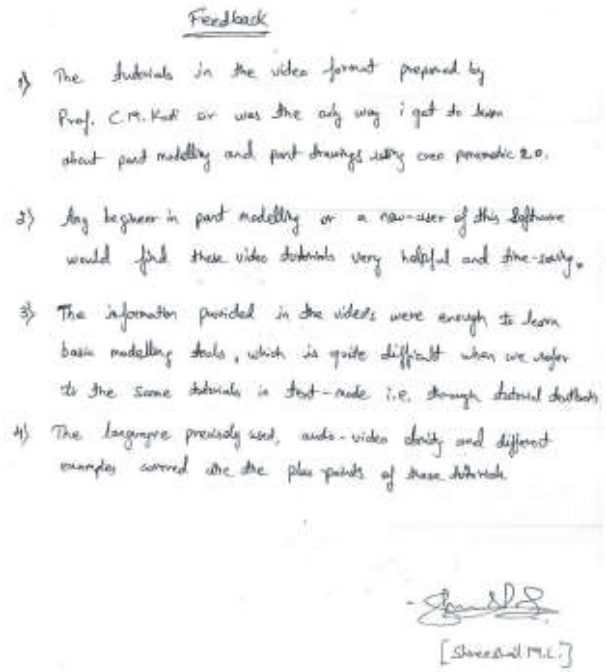

Fig. 5. Feedback by a Teacher.

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