

# Chapter Five

## Development, implementation and evaluation of screencasts according to phase 1 design principles for an N2 Industrial Electronics course

---

### 5.1 Introduction

Current students, the so-called “Net Generation” or “Digital Natives,” daily use digital devices and spend much time online (Tapscott, 2011). They are familiar with modern technology, hypermedia and online surroundings as they grew up with technology (Hoadley, 2004). Creation of multimedia educational material is becoming less complicated and less expensive. The use of screencasts is progressively becoming more widespread in higher education (Engelhart, 1997). Screencasts allow lecturers to document what is on their computer screen and share it with students. When a student views a screencast, the outcome is like a live incident; it is like watching the lecturer's presentation in a classroom. Lecturers' presence remains vital in training. However, the use of screencasts can elongate a lecturer's presence when students are not in classrooms (Engelhart, 1997; Hoadley, 2004).

### 5.2 Creating screencasts

A methodical workflow of creating screencast by stages will be described. When creating a screencast, there are five steps to follow. These steps are described as the researcher followed them.

#### 5.2.1 Planning

Plan the part of the work you want to do before you start recording carefully. The planning incorporates whatever is recorded; whatever are the goals and content of the screencast. The draft should be thorough. It should consist of a word by word account of all that will be narrated and with the graphic structures of onscreen movement (Hoadley, 2004; Jones, 2010). I found it best for the theoretical parts to plan a verbal account of the screencast, so when the recording begins you can refer to it. In the case of calculations I found working out the example beforehand to be useful so as not to make mistakes in the recording phase. For the theoretical part a PowerPoint presentation was used and for the calculations I used Windows Journal™.

#### 5.2.2 Preparation

In this phase, testing if the equipment is operational takes place. All resources used during the screencast must be prepared. Computer screen should be clear of unnecessary content that could

---

confuse the student or expose unnecessary information. Software applications, documents, etc. that will be utilised in screencast should be opened and sized to the recording window (Hoadley, 2004; Jones, 2010). I ensured that the antivirus program or other programs did not pop up during recordings and disabled them temporarily.

### **5.2.3 Recording**

The computer screen and voice are simultaneously recorded. It is crucial to speak clearly when recording screencasts. It is also practical to pause the recording when a frame is opened and placed inside the recording area. Everything is recorded in the screencast, as well as mouse movements and clicks which can be edited. Mouse actions should be unhurried when something is being indicated. The rest of the time mouse movements should be coordinated not to become bothersome and confusing to the student window (Hoadley, 2004; Jones, 2010). I talked slower than normally and also pronounced the words correctly, which resulted in voice clarity.

### **5.2.4 Editing**

After the recording, the video should be revised and corrected, if necessary. In the editing stage, the lecturer can: correct video, if some blunders have been made during the recording, they can be edited or cut out; correct audio; add pans and zooms; add titles and highlights; produce a heading and a concluding slide; create transitions, etc. (Hoadley, 2004; Jones, 2010). When the screencast contains minor errors, you could edit it. When larger problems transpire, the developer has to again record the entire episode in order to keep continuity.

### **5.2.5 Distributing**

The screencast capturing program used in this study was Camtasia Studio™, which is a common screencasting software program (TechSmith, 2013). Camtasia Studio™ has a “track-based” interface with video track and audio tracking that permits for non-linear correcting and repositioning digital fragments to earlier or later in the production. Camtasia Studio™ also includes special effects like zoom, pan, locked captioning, splash screens, and transitions that can enhance the application. Completed screencasts can be viewed from almost any device from computers to mobile phones. (Song, 2009).

After recording and editing, everybody concerned agreed and signed off. The concluding files of the screencast should be compiled in the desired file format for publishing and distributing to students. Selecting a video file format will be determined by the distribution method. The screencast should be verified before the concluding publication (Hoadley, 2004; Jones, 2010). As many students had access to DVD players as the only technology, the screencasts were exported as Windows Media Video (WMV) and Audio Video Interleave Video File (AVI) formats. Figure 5.1 is a screen dump as an

example of the interface of the screencasts developed during this study. The complete screencast is available as Addendum 5.1.

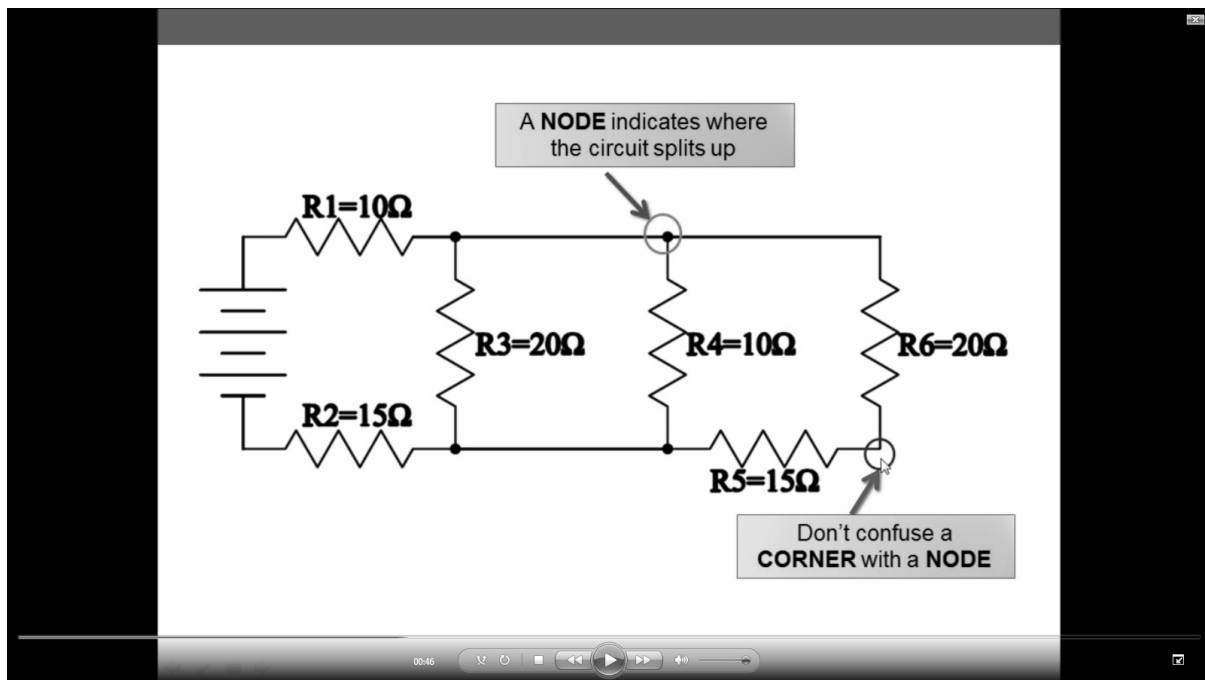


Figure 5.1: Screen dump of a screencast developed during this study

### 5.3 Implementation of screencasts

The screencast was implemented in the second trimester for the students in the Industrial Electronics N2 classes. The screencast was made accessible to all students and not only to the students that took part in the interviews. The screencast was handed out on a voluntary base. The few students who didn't use the screencast were those who did not have access to a computer; that problem was overcome when the computer class was put to their disposal after normal college hours. The screencasts were there to help the students with solving misconceptions formed in DC resistive circuits.

### 5.4 Evaluation of screencasts

At the end of the phase 2 and 3 of the research design the students were given a questionnaire (Addendum 5.2). The group that was surveyed was presented with screencasts that concentrated on the four chosen misconceptions. The questionnaire comprised ten questions, seven closed-end questions and three open-end questions. Though there were ten questions the questions of primary interest were:

- How useful do you find the videos?
- Do you want the screencast done in typing or handwriting?
- What things did you like most about the videos?

The students were given the opportunity to provide feedback on the positive or negative aspects of the screencasts. The survey was voluntary and anonymous and 29 of the 38 respondents (76%) participated in the evaluation (Addendum 5.3).

**Table 5.1 Quantitative questions and data relating to the evaluation questionnaire on screencasts**

Questions	Options	Counts	Percentage
1. Have you viewed the screencasts provided to you on the DVD?	Yes	27	93%
	No	2	7%
2. Are screencasts easier to understand than the text book?	Yes	25	86%
	No	2	7%
3. Do you want the screencast done in typing or handwriting?	Hand writing	20	69%
	Typing	7	24%
	Missing	2	7%
4. How many times did you use the screencast?	0 times	2	7%
	1-2 times	15	52%
	3-4 times	10	34%
	More than 5 times	2	7%
5. For what purpose did you use the screen cast?	Revision	19	61%
	Clarity	12	39%
6. How favourable or unfavourable is your opinion of the videos?	Poor	0	0%
	Fair	2	7%
	Good	12	41%
	Very good	7	24%
	Excellent	6	21%
7. How useful do you find the videos?	Not at all useful	0	0%
	Somewhat useful	0	0%
	Neutral	4	14%
	Useful	12	41%
	Very useful	10	34%
	Missing	3	10%
8. What things do you like most about the videos? (up to 3 responses)	Personalised	2	7%
	Demonstration	16	55%
	Time	2	7%
	Repeat	20	69%
	See lecturer	14	48%
	Hear lecturer	8	28%
9. What things do you like least about the videos? (up to 3 responses)	Too short	7	24%
	Difficult	3	10%
	Errors	0	0%
	Time	6	21%
	Do not know	4	14%
	Missing	9	31%

Overall, the students found the screencasts favourable with 41% finding them useful and 34% finding them very useful (Figure 5.1). This was very positive as 14% were neutral about the usefulness of screencasts, and no respondents (0%) found them somewhat useful or not at all useful (Figure 5.1).

In response to the question of how many students prefer handwriting in the screencasts above typing, 69% of the students preferred handwriting and 24% of students preferred typing, with seven per cent not answering the question (Figure 5.2).

On the question that asked the students what they liked about the screencasts, they could have chosen up to three options. Sixty nine per cent (69%) selected the ability to watch the screencast more than once, 55% found a screencast a demonstration of how to find what they need and 48% found the ability to see what the lecturer is doing. (Figure 5.3). Most respondents used the screencasts for revision (66%) before a test or examination, rather than using it for clarity on a specific concept (41%, Figure 5.4).

The written comments on the last open ended question were generally positive and concentrated on the flexibility and usefulness of screencasts. Students also appreciated watching supplementary theory and worked examples as well as the capability to watch it over and over again. An analytical set of responses were:

Can watch it more than once & easier to understand

When you see it demonstrated you understand it better, because you see how it is done

The book does not explain everything and it is easier to understand with the screencasts

With the aid of the screencasts the information can be broken down into understandable concepts.

And an interesting comment of a student about screencasts was: "We know and remember mostly what we see and hear because we are lazy to practise." Not all students learn at the same speed and the repeated use of screencasts could not only improve the learning curve, but will allow students to learn at their own pace.

## 5.5 Challenges

While there were many positive comments on screencasts, some challenges remain. They include:

- The potential of decreased class attendance
- Loss in student-lecturer relationship
- For a student inactively viewing events on a computer screen, things are occurring at lightning speed. This seemed crushing for some and intriguing to others
- Students who did not complete the questionnaire may not have used the screencasts
- Some students daily travel far from the deep rural areas to study at NCRFET Kathu Campus and they may not have had the time to view the screencasts
- Most students did not have the means to view the screencasts.

## 5.6 Design principles relating to phases 2 and 3

After the quantitative and qualitative analyses, the recognised design principles that were used during the development, implementation and evaluation of the screencasts prepared for DC resistive circuits as part of phase 2 and 3 of the DBR cycle related to:

---

- Developing teaching-learning strategies like screencasts to prevent or address misconceptions in DC resistive circuits
- Taking into account the embedded features of effective screencasts
- Assessing the use of the selected teaching-learning strategy like screencasts to improve instruction.

## **5.7 Chapter summary**

The use of screencasts do not jeopardise the continuation of the conventional lecture; it could even increase its potential. Screencasts could enrich learning as they could be included into the teaching and learning development in order to reinforce student learning, as well as during tutoring sessions. Lecturers can offer students a method to view the same learning event repeatedly.

Screen capturing software presents flexibility for a variety of intentions in engineering education. It calls for little or no teaching to use. In future, it can be anticipated that it can be used for other purposes not mentioned here and outside the ones described here (Barker et al., 2010; Engelhart, 1997).