A Rich Content Self Study Tool

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1. EXECUTIVE SUMMARY

The paper discusses the usability of video recordings of lectures in the learning process and recommends additional content which needs to be contextually interwoven in the recording. It also presents a tool developed to facilitate recording and linking of materials in rich self-study content.

1.1. Background

Since the advent of Internet and multimedia content it's been experimented with recordings of lectures for the purpose of individual asynchronous learning. The student could view the lecture not only in cases when she or he was not able to attend it synchronously but also to review it for clarifying purposes and for deeper study of the subject.

1.2. Approach

Based on the decade of experiments authors reached the conclusion that audio is more important than video recording of the lecturer and for better results additional content is needed as well. In particular, the recording of the presentation screen has been found to be of major importance especially if it could be captured with all remarks, sketches and other interventions presenter made on the screen. Furthermore, expanded text, additional readings, examples, exercises and quizzes contribute to fulfilling student's needs in the learning process and assist them in acquiring the knowledge. The recoding itself should be sliced in granules of knowledge and additional content linked in contextually. Full control of presentation flow should be in student's hands. Production of such rich content should be simple even to a lecturer without much technical skills.

1.3. Alternatives

A range of products have been on the market aimed at recording the lecturer, capturing the desktop and editing video material. However, a simple to use tool that would integrate those sources on contextual basis has not been found. Therefore a dedicated tool has been developed.

1.4. The Tool

"Pyramida" records the video of the lecture, desktop and one audio source. It also records timings of all slide transitions in the .ppt presentation used. After the lecture, the recording can be linked with .ppt in one rich content package. At replay time, viewing can be jumped to any slide, randomly. Additionally, student can read additional text, follow links or answer questions, which all change from slide to slide. Preparing additional content for the author of the lecture was made easy via a PowerPoint plug-in which enables author, while editing standard .ppt, to add links to external texts and web pages, indices and questions, in separate windows. They can be changed even after the recording of the presentation and re-integrated with video recording, at any time, repetitively.

1.5. Conclusions

Such rich self-study content has been well accepted among students. "Pyramidia" has proven it's simplicity of use and usefulness in practice and has a potential of being used in a wide audience of educators and students. Further development will be focused on streaming the recording off a web site to eliminate the delay and hassle in downloading the whole recording before viewing it.

2.   VIDEO RECORDINGS OF LECTURES

Since the time multimedia came to the desktop of "ordinary" users it has been experimented with video recording of lectures. There is a lot of appeal in doing so. It is hoped it could help students who couldn't attend the lecture or those who can never do so, due to some physical disabilities or geographical distance. Even those who attended the live lecture have often the need to re-live it and rethink what has been presented or to inspect it and study deeper.

Lecturers could have benefits of their lectures being recorded since one can not always do their best performance. Thus recordings of best ones could be sometimes used instead of live lecture, if top performance cannot be achieved. Further, by the mean of video recordings, a lecturer has further reach to the audience both in space and time. The recording can be made available to the audience far away geographically, but also to those who will use it much, much later. Seeing all those benefits, some lecturers have started creating their own legacy in such a way.

3.   EXPERIENCE

Authors were experimenting with video recordings of lectures ever since 1997. The recordings were available to students via web pages of respective subjects. The first conclusion that has been made was that the audio recording is more important than the video recording of the lecturer. Granted, the importance of video recording has been higher in cases when lecturer performed an experiment.

However, it has been found that student pay much more attention to the recording of the blackboard or presentation screen. Thus the recordings have been modified to include two video sources: the one of the lecturer and the recording of the desktop. The final conclusion was that the video recording of the lecturer does carry useful information to students, but it's significance is much lower that those of the recording of the desktop and voice of the presenter.

Therefore in further experiments the video recording of the desktop was given much bigger part of the screen at the playback time then to the recording of the lecturer. However, the final recommendation is that the two screens need to be swappable during playback for the sake of the moments when the presenter performs an experiment and the recording of the lecturer zooms in on it.

Another important note was that linear, continuous, sequential consummation of the recording is tiring and demotivating. Rather, students needed free navigation through the recording with emphasis on easily finding "(sub)chapters" of the lecture, the beginnings of modules and granules.

4.   Additional Content

Further study revealed that students would benefit if they could pause the recording and read more text in addition to what has been presented both on the screen (desktop) and orally. Besides this extended text, they need links to further readings, similar information, simulators etc. They would also greatly benefit if they could verify whether they grasped the concept and understood what has been presented in the lecture so far by answering questions and/or filling out quizes. Photographs, audio and video clips, programs and other "media" should be available in "full quality" to be consumed, inspected and studied in full.

Therefore all this additional content should be available at the time of the playback.

5.   PYRAMIDIA

A range of products are available that can record the lecture or the desktop. Some can record both. Some allow slicing of presentation. Other even link recording with PowerPoint and its slide transitions. However, a single tool combining all these features, linking additional content on contextual basis and requiring minimal additional effort and knowledge has not been found.

Therefore, "Pyramidia" is a tool that has been developed to meet all these requests. It is a package that consists of three components: a recorder, a player and a plug-in for PowerPoint.

5.1. Pyramida recorder

It records three channels: one (external) video source, the desktop and one audio source. Everything that happens on the desktop, regardless of the application(s) running is recorded in regular, adjustable, intervals. This includes notes, drawings and other interventions the presenter makes during the lecture using "SmartBoard", tablet or regular mouse. Exactly those interventions on the "blackboard" accompanied with audio of the lecturer are the "added value" that recordings of lectures bring to the world, what makes them more useful than traditional, paper textbooks.

One more thing is recorded: events. Slide transition in PowerPoint, to be precise. Pyramidia does not require PowerPoint to be used. However, in order to enable users to jump to chapters in lecture, some kind of signaling needs to be in place in order to determine when does the chapter begin. The most convenient way to do it is to grab slide transition events and record their timing. In such a way "slicing" of recording can be performed completely automatically in most natural and convenient way for the lecturer.

5.2. Pyramida plug-in for PowerPoint

Additional content is the second major "added value". However, the issue is where to store it and how to connect it with the recorder content. Again, PowerPoint has been used as a synchronizing device. Today, lectures are mostly delivered with the aid of a PowerPoint presentation. A number of terms, points, ideas or data are put on one slide and the lecturer tells stories about them. During the playback time the user looks at the information presented on screen (slide) and listens to what lecturer has to say to it. If student wants to get more information, she or he can read additional, extended text which author simply puts in "notes" section of that slide. "Notes" are provided in (a window in) PowerPoint. Pyramidia plug-in provides additional windows, linked to the current slide: links, questions and indices. Links are used to make it easy for student to study even deeper by visiting external documents and web pages. Indices are provided for easier navigation at playback time through the recording by choosing from keywords instead just from titles of slides. Questions are arranged in form of quizzes linked to each individual slide.

In this way, the author in most natural way enters additional content while at playback time it can be accessed in proper context. All this additional information is stored in PowerPoint file, too. Thus, there is only one data file per presentation.

5.3. Pyramida player

In order to playback the recording, it has to be packaged or "published". This is done in recorder. Publishing is the moment when video and audio recordings, timeline and external sources of data are linked together and prepared in the format which Pyramidia player can recognize and play back. Actually, using the PowerPoint plug-in, the whole textual content can be edited in .ppt file even after the recording of the videos. They can be reintegrated with video and audio using recorder at any time, provided that the number and order of slides have not been changed.

Published content can be viewed sequentially or randomly, jumping from slide to slide or by searching keywords. The playback can be stopped at any time, extended text read, links followed, questions answered and playback resumed to move on. User can define his own bookmarks and save them to an external file.

6. REQUIREMENTS

In described manner any lecturer can produce video recording of his lecture with enriched content, without any special technical knowledge or skill.

Special attention has been paid to use only standard HW and SW which majority of potential users have. Video coding and compression can consume a lot of processing power, so there is provision to do only coding at the time of lecture which is less computationally intense. Compression can be completed at a later time, in the off-line manner, before the publishing stage.

7. CONCLUSION

By development and use of "Pyramidia" it has been proven that video recordings of lectures can be valuable tool for self-study. It has also been shown that additional content linked with recording on contextual basis significantly improves the usefulness of such learning material. In the same time it has been demonstrated that both recording and producing additional information as well as producing final product are simple, straightforward and can be accomplished even by a novice user of ICT.

It is hoped that "Pyramidia" would appeal to the wide audience of teachers, lecturers and presenters and that it would result in a significant number of rich content materials produced for self-study purposes.

Currently, the materials produced by "Pyramidia" are stored in a file and student needs to download the whole file and play it with "Pyramidia" player. Further development will be directed towards streaming the material from a web site.

8. REFERENCES

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