



A STUDY OF THE EFFECTIVENESS OF A COLLABORATIVE EDITING TOOL IN ONLINE LEARNING

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Summary

Web 2.0 tools, such as the collaborative editing tool Google Docs and Spreadsheet, empower users in creating knowledge collaboratively and sharing it with communities of participation. This tool was used with Master's level students to teach some content (Dick and Carey model of instructional design).

Eighteen students on the Master in Educational Technology programme took part in the experiment, which had a pre- and post test single group design. The participants worked on cases by collaborating on Excel and Word files, using the share, edit and chat features. They could see the online editing in the 'viewing now' feature and in Excel they could observe the features other editors were working on as that part/cell was highlighted and tagged. The researcher provided feedback using the 'insert comment' feature. Participants also used other available formatting features which helped in the process of learning.

The statistical analysis (t-ratios) showed that the students' achievement was enhanced significantly at the 0.01 level. Also, the opinions of participants on the use of the collaborative editing tool as an online learning and group learning tool showed that almost all students (94%) felt the tool was useful in these respects.

The findings of this study underline the value of such collaborative tools in the teaching- learning process.

Introduction

Collaborative editing is the practice of a group of individuals working simultaneously in editing a document through individual contributions. A collaborative editing tool is used for this purpose. Using such editing tools, authorized users can edit a document, see who else is working on it, and watch – in real time – as others make changes.

Unlike simple version control, in which a single working copy of a file is managed among editors one at a time, collaborative editing allows multiple users to make changes at the same time.

A group of individuals – in the same location or geographically separated – can use collaborative editing tools to create a document that reflects the contributions of the group, without having to track and coordinate edits.

Types of collaborative editing tool

- There are two types of collaborative editing, *real-time* and *non-real-time*. The former allows users to edit the same file at any time, including editing at the same time, while the latter does not permit editing of the same file at the same time and so is similar to revision control systems.

- **A Web-based collaborative editing tool: Google Docs and Spreadsheets**

Web-based collaborative editing tools require only a browser and internet access and so the tools become increasingly platform-independent and the opportunities for collaborative editing among wider-ranging groups expand significantly. One example is Google Docs, which is free of charge and has the following important features:

- ***Quick creation, editing and uploading***

Basic documents can be created from scratch and all the basic formatting can be done, such as: making bulleted lists; sorting by columns; adding tables, images, comments and formulas; and changing fonts. Familiar toolbar buttons make the editing straightforward, and it is easy to upload existing files as the system accepts most popular file formats, including DOC, XLS, ODT, ODS, RTF, CSV and PPT.

- ***Access and editing from anywhere***

People can be invited to share a document by entering their e-mail addresses and they can access the file as soon as they sign in. No downloading is involved: one can access documents, spreadsheets and presentations from any computer with an internet connection and a standard browser.

- ***Sharing changes in real time***

Real-time collaboration is possible as people can view and make changes at the same time. There is an on-screen chat window for spreadsheets. Also document revisions are available which show exactly who changed what, and when. A presentation can be viewed together, as anyone who joins a presentation can automatically follow it along with the presenter.

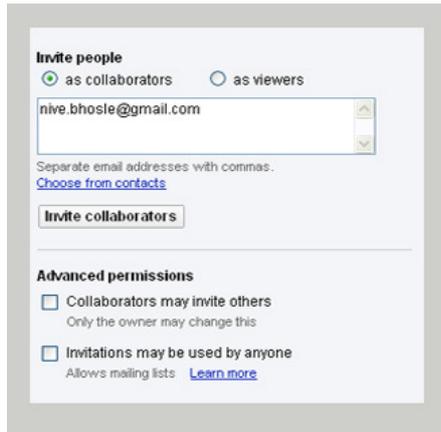


Figure 1: Feature – Share

➤ **Storing and organizing files**

Online storage and an auto-save feature are available. One can save documents and spreadsheets to one's own computer in DOC, XLS, CSV, ODS, ODF, PDF, RTF and HTML formats. One can easily find documents by organizing them into as many folders as one wants through drag and drop.

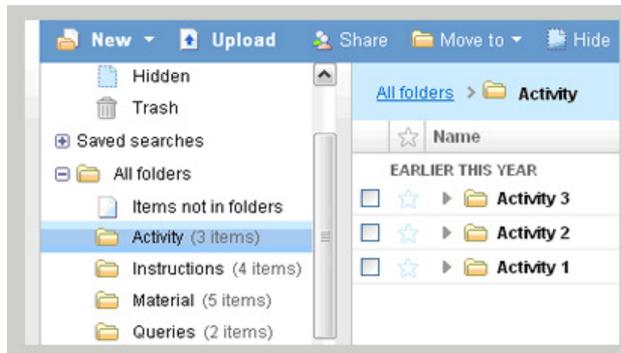


Figure 2: File organization

➤ **Publishing work**

One can publish documents online as normal-looking Webpages, without having to learn anything new. They can be published to the entire world, just a few people or, through the 'Unpublish' option, no one at all. Documents can also be posted to blogs.

Review of research

The findings in some relevant research are outlined briefly below.

In the study 'Gaga for Google in the twenty-first century advanced placement language classroom', Adams (2008) pointed out the increasing need for tools like Google Apps in online education. He examined how one program, 'Advanced Placement Language and Composition', incorporates Web 2.0 tools, including

several Google applications (gmail, docs, a notebook, a personalized homepage, Web pages, a calendar, a blogger and talk) into its high school curriculum. .

Oishi's (2007) research on one of the new applications introduced by Google – 'Google Apps Working Together' threw light on Google Docs and Spreadsheets which allow the creation of documents and spreadsheets with a more collaborative capacity.

Also, Courtin and Giraud, (2008) used ZWikiCoop, a web collaborative editing tool, in an experiment at school in which empirical analysis of group awareness indicators in the electronic situation highlighted the necessity of providing the participants with computer-supported indicators, even if they work at the same place. Traceability was found to be one of the benefits worth noting in computer-supported solutions in contrast to traditional situations. The results suggest that working together on the same document implies a perfect coordination of the various tasks. This requires a well-structured document and assigning of roles.

A position paper by Perry (2008) described work on integrating shared editing with messaging systems for scientific collaboration within a widely distributed environment. The researcher presents scenarios and describes the requirements for collaborative editing integrated with group discussion and synchronous messaging. The researcher also developed 'Pervasive Collaborative Computing Environment' (PCCE). The flexibility of the tool was found to be important and the PCCE system allowed integration of several tools such as messaging, file-sharing, and collaborative editing mechanisms.

Baecker et al. (1994) presented the results of studies of collaborative writing in which they applied an SASSE ('Synchronous Asynchronous Structured Shared Editor') design. The SASSE provided shared workspace in the form of a shared document and authors were able to work on networked Macintosh computers on a single document.

Another study by Baecker et al. (1995) entitled 'Learning to write together using groupware' describes collaborative writing by two groups of four grade six students using synchronous collaborative writing software over a 12-week period. It also demonstrated the importance of concepts such as awareness, ownership and control in the writing process, and highlighted many examples of the strengths and weaknesses of the writing software.

These and other studies indicate that Google Docs collaborative editing is simple, very usable, effective and efficient; and also setting up collaboration with colleagues is very straightforward.

The present study

Objectives

The objectives of this study were to:

- examine the effectiveness of a collaborative editing tool for online learning;
- find out the students' opinions on the use of this tool.

Hypotheses

- There will be significant differences between the pre-test and post-test scores of students.
- Eighty per cent of the students will achieve 80% mastery after going through the online sessions using a collaborative editing tool.

Methodology

For the present study a pre-experimental design (single group pre-test and post-test) was employed. The sample was selected from the Master of Educational Technology-Computer Applications (METCA) programme offered by the SNTD Women's University. The sample size was 18, all of them women in the age group 20 to 24.

The independent variable was the collaborative editing tool (Google Docs and Spreadsheets) and the dependent variable was student achievement. The students' views on the tool for collaborative learning and online learning were also studied.

Achievement tests (on instructional design: Dick and Carey model) and a questionnaire to collect students' opinions were developed by the researchers. Two parallel achievement tests were developed for use as pre- and post-tests. The questionnaire had a 4-point rating scale: 'Strongly agree', 'Agree', 'Disagree' and 'Strongly disagree'.

Experiment

The pre-test was administered to all the students. The treatment started with an orientation session with participants in which they were introduced to the collaborative editing tool selected for this study – Google Docs and Spreadsheets.

A. Introduction/orientation to the collaborative editing tool

The sample was given a short presentation about the collaborative editing tool selected for the research, on which the researcher had created an account. All the learners were invited to share files and given guidance on how to create their own accounts, and create and share files, with all these processes being demonstrated in the class.

First, an invitation to share a file named 'Welcome' as a viewer was sent to the gmail IDs of all the participants. In the orientation session, the features of file creating, sharing and editing were shown, and other features useful for file organization were also introduced. At the end of the session participants were asked to view the shared file.

After the session, the following files were shared with the participants:

1. 'General Instructions' which includes a list of points on the use of applications and procedures to be followed
2. 'Updates', which gives regular updates about the sessions and next steps to be carried out

3. 'Queries', where participants, could raise any doubts which researcher could then clarify.

An activity was arranged as an 'ice-breaker' The learners were asked to explore features of Google Docs and Spreadsheets and write about them and then to share what they had written with two other participants (two roll numbers next to them) as collaborators.

In the activity participants used and explored various features such as creating files, sharing files, editing files, inserting comments, images and links, and revision.

B. Using the tool for the teaching-learning process

The general pattern of the activities for the teaching-learning process was as follows: the uploading of reading material for a sub-topic; a large group activity on the given topic in the form of a case study; and, finally, the provision of feedback. After all the sub-topics were completed in this way, a small group activity was given.

The content to be taught was the first two steps from the Dick and Carey Systems Approach Model i.e. assess needs to identify goals, and analyze learners and contexts. Thus the sub-topics involved needs analysis, performance analysis, learner analysis and context analysis.

The activity took the following form:

Day 1: After the introduction of the topic, the reading material on needs analysis and a case study on the same area were uploaded. A spreadsheet was created and shared by the researcher with all the participants as collaborators to work on and solve the case.

Day 2: The reading material on performance and learner analysis and a case study on learner analysis were uploaded. Again a spreadsheet created by the researcher was shared with all the participants to work on collaboratively.

Day 3: Feedback on the activity on needs analysis was given by the researcher. The reading material on context analysis and a related case study were uploaded and a spreadsheet was shared with the same purpose as in days 1 and 2.

Day 4: Feedback was given on the learner analysis activity. Activity 3 was uploaded, for which the participants were divided into three small groups – two of seven members each and one of six members. The groups were assigned roles as different analyzers (needs, learners and contexts) and they first collaborated on (word) documents in pairs. Then the entire group cooperated to produce a presentation, with one group member assigned as the task organizer who was responsible for collecting the points on one of the sub-topics in the presentation while others helped her.

Day 5: Feedback on the activity on context analysis was provided and participants continued working on Activity 3.

Day 6: Activity 3 and its treatment were completed by noon.

During these sessions, the participants solved the given cases by collaborating on files – Excel, Word. They used features of share, edit and chat and they could see the online editing in the ‘viewing now’ feature and in Excel they could observe the features other editors were working on as that part/cell was highlighted and tagged. The researcher provided feedback using the ‘Insert comment’ feature. The participants also used other formatting features available that helped in the process, such as using different colours to differentiate their texts from those of others.

A post-test was administered to the sample after the six-day experiment was completed.

The t-ratio was used to test the null hypothesis that there would be no significant increase in the students’ achievement, resulting in a t-ratio of 12.696 which was significant at the .01 level. This implies that the collaborative editing tool was effective in enhancing achievement.

The questionnaire had the following sections:

Section I: Use of the collaborative editing tool (Google Docs and Spreadsheets) by the participants

Of the sample, 94.44 % (33.33% ‘Excellent’ and 61.11% ‘Good’) had positive opinions about Google Docs and Spreadsheets. A few participants did not find it easy to upload the file, perhaps because this feature was being compared with the feature for creating, which was used more and was found to be straightforward by all the participants. Though almost everyone had edited documents, other features were rated slightly lower. Also some participants could not use the chat feature, possibly because of some technical problem with this particular feature (as mentioned by one of the participants) and the unavailability of the internet around the time of working on the document.

The participants used features such as editing, sharing and creating files and found the tool to be user-friendly.

Section II: A collaborative editing tool as an online learning tool (feature-wise)

The sessions were designed to incorporate most of the collaborative features. As mentioned in Section I, participants not only used these features but had very positive views about them. The features involved were sharing – as a viewer as well as collaborator – the availability of different types of files (documents, spreadsheets, presentations) for collaboration and chat, along with working documents (spreadsheets) and inserting comments.

In general, sharing answers/opinions with others, reading others’ answers to the same problems, communicating synchronously with peers and the facilitator and receiving feedback helped to improve students’ learning, as reflected in their questionnaire responses.

Section III: A collaborative editing tool as an online group learning tool (general)

Some of the participants felt that the collaborative editing tool could not be used to evaluate individual contributions in group work. For this feature, they had colour-coded or tagged their contributions to the group work but the researcher feels they

should be autotagged/automarked as is said to be possible with some other collaborative editing tools. This would help in identifying individual work, would assure learners that their work is seen clearly as 'theirs' and would allow the facilitator to judge each individual's work more accurately.

Overall, almost all involved held positive views on: (a) the usefulness of the collaborative editing tool in the evaluation of group work; (b) the time saved in the process of group work; (c) the evaluation of their own contributions; and (d) the general usefulness of the tool in education.

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