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# Group and Individual Assessments via Cloud Computing Tools in PBL

Necmettin Şentürk[a]*

* Corresponding author: Necmettin Şentürk, nsenturk1@googlemail.com

[a]*Babes-Bolyai University, Cluj-Napoca, Romania, nsenturk1@googlemail.com*

**Abstract**

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This paper describes the utilization of cloud-computing tools for assessment of collaboration in project based learning. The usage of cloud-computing tools like Google Drive has increased among people in order to store and share data. In this collaborative study, high school students search their project in school and at home and share their finding with their group members on cloud computing tools to discuss the findings and prepare the projects. Group work is generally assessed by using group reports and interview questions. However these tools are not adequate to assess individuals` contribution and social loafing could be occurred in collaboration. Therefore group members` individual contributions should be monitored and assessed. On cloud-computing tools each contribution such as finding images, selecting texts and editing presentation is saved as person by person. Rubrics, depend on log of activities on cloud, are effective tools to assess individuals. These contributions are graded to reveal group members` performance in group work.

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**Keywords:** Collaboration, assessment, cloud-computing, Google Applications, project-based learning.

## 1. Introduction

In recent years, people benefit from fruit of technology and make their duties easier. In every field of life people say the popular technological quote` the world is under your fingertips`. They can access any kind of information and communicate with people around the world.

In educational field teachers utilize technological tools to prepare and present their teaching and to assess students. Students search on internet, write their reports and prepare presentations on computer. Moreover, students and teachers use technology to communicate and collaborate via internet. Nowadays there are many online tools such as wikis, websites, documents, forums, presentations.

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Teachers and students can edit, form, store, and share files and documents via cloud-computing systems that supports collaboration (Armbrust et al., 2009).

Group work reports or presentations are assessed as well as individual reports or presentations. On the other hand, it is difficult to assess group process, collaboration among the group members because some students could contribute less than others (Race, 2001). Technology could help to solve one of main collaborative work problems; assessment.

In this study students explore, learn, collaborate and form a digital product by the help of online resources and Google applications. The purpose of this study is to show importance of individual assessment tools and how cloud computing applications facilitate group and individual assessments of project-based learning in high school courses.

## 2. Cloud Computing

Cloud computing briefly means the hardware services and software services over the Internet, provided by datacenters. It offers many advantages to users as storing, editing and sharing data when internet is available. Users access their data easily wherever and whenever they want (Armbrust et al., 2009).

Cloud computing facilitates collaboration because people have plenty of options to access their data on cloud such as personal computers, laptops, tablets, smart phones, etc. Therefore, millions of people use cloud computing services such as Dropbox, Google Drive, wikis, etc (Gonzalez-Martinez et al, 2015).

This technology has influenced education and many of cloud-based tools support asynchronous and synchronous collaboration. Students can work together and edit their documents in classrooms or different places at the same time. Also students edit the documents individually and contribute the group work (Donna, & Miller, 2013).

Gonzalez-Martinez et al (2015) analyzed 112 publications including conference papers, journal articles, book chapters and categorized cloud computing systems. They enlisted the advantages of cloud applications as high availability, user-friendly, cost saving, and time saving. They reached these benefits, showing explicitly why cloud computing systems are utilized collaboration in education. After analyzing many studies, in an educational technology course, Google Docs improved collaboration in a blended learning (Gonzalez-Martinez et al, 2015). Similarly, pre-service teachers used collaborative cloud-based applications, like Google Apps and their attitudes towards them searched. They were more likely to use them for teaching because they stated that these tools developed their understanding (Gonzalez-Martinez et al, 2015).

Although cloud-computing technologies are applied successfully and support collaboration in undergraduate education, pre-service teachers have hesitations towards using new technologies and implementing technology in classrooms (Donna, & Miller, 2013).

Donna and Miller (2013) studied on pre-service science teachers' perceived toward using cloud-computing tools to support inquiry-based pedagogies and classified barriers as first-order and second-order. First-order barriers depend on technological issues such as availability of computer or device,

access to internet, difficulties in usage online documents, lack of time and students` ability. These barriers must be removed to implement cloud-based applications successfully. Second-order barriers depend on teachers` beliefs about using technological tools as classroom materials. They stated that the technological tools were not directly related to teach scientific context, were limited face-to-face collaboration, could lead to social loafing and could affect classroom management negatively by allowing cheating and sending unsuitable comment as anonymous. Overcoming the second-order barriers is more difficult on account of teachers` personal nature. Therefore, Donna and Miller (2013) reported that teachers might not pay attention and use cloud-computing tools unless they see helping students collaborating and understanding science.

Teachers` concerns on group management and classroom management are partly reasonable due to difficulties on assessing individuals` contribution to group work. Race (2001) offered some approaches how to assess individuals such as contribution mark, oral or written tests. Unless group members are assessed individually, giving the same mark for all encourages social loafers. Integration of group reward and individuals' contribution prevent form social losing and other disagreement on collaboration.

The selection of cloud computing system gains importance due to technological opportunities, students` ability and teachers` hesitations. The usage of appropriate cloud-based tool is required for effective collaboration. When popular cloud-based tools such as Google Docs, Zoho, iStorm, Buzzword, etc. are compared Google Docs is one of most appropriate collaborative tools with respect to types of documents, familiar interface and keeping users` tracks (Vallance et al., 2010).

## 3. Group Assessment Tools

The students are expected to follow PBL rules. Students search, upload their finding to Google Drive and write weekly reports. I interview with students. In semi-structured interviews, open-ended questions are asked to students to explore their views, beliefs, and experiences about projects. Also outside of school performance are tried to reveal by using reports and interview questions. Although weekly reports and interviews can assess group process, they are sufficient to indicate individuals` contribution.

## 4. Rubric as an Individual Assessment Tool

Rubric is an assessment tool to evaluate students` work in a constructed way. Firstly, rubric must guide students to do quality works and teacher to evaluate their works fairly (Popham, 1997). Evaluating criteria, quality definitions and scoring scale are essential elements of rubric (Popham, 1997).

Students share texts, photos and video clips and then edit their files to form their presentation. In addition to theory, they do their experiment and film it. They make their group video of the experiment and show in presentation. In this study, text, photo, video clip, making video and presentation are the

criteria of rubric. Scoring scale depends on the number and quality of the shared files. Besides, editing the shared files is important for the quality of the presentation. Rubric of this study is prepared as taken into consideration of Goodrich`s (1997) steps and the types of shared and edited files. (Appendix 1)

## 5. Conclusion

In digital age technology is a component of education. Collaboration and assessment are facilitated by technology especially cloud computing tools. Teachers may use cloud computing tools either teaching or assessing students.

Cloud computing systems keep log of activities and teachers can track students` contributions on group work and assess them individually as well. Therefore, monitoring students` work and individual assessment might prevent some reluctant students from social loafing and other working students from `sucker effect` (Webb, 1995). Rubric is an effective assessment tool to prevent group work from these facts. Unwilling students might be motivated and contribute more.

Rubric as an individual assessment tool might be integrated to overall mark. Score of rubric depends on the importance of individual work and duties in projects. If the effect of rubric is less, social loafing can still occur. If the effect of rubric is more, it may damage the group work and free rider may occur. That`s why, percentage of individual work is significant. Cloud computing tools are suggested to monitor individuals` contributions which are assessed by rubrics to support collaboration in group works.

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Appendix 1

Rubric for Online collaboration

| | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| Text | No uploaded text document | 1 uploaded text document | Selected parts of text on presentation | Editing text on presentation |
| Photos | No uploaded photo or image | 1 -2 uploaded photo or image | 3 or more photo or image | At least 1 selected photo or image in presentation |
| Video or animation | No uploaded video or animation | 1 video or animation, explaining theory, | Selected video or animation on presentation | Editing video or animation |
| Making Video | Not taking part to make video | Taking part to make video (act, narrate, shoot) | Editing video simply (cut, music, etc) | Editing video on presentation (effects, subscribe, etc) |
| Presentation | No contribution | Editing presentation such as transition, effects, organization of documents, etc | Using a different digital product such as Google site, website, prezi, etc | Using effects and some features of the digital products (background, transition affetcs, zoom in and out,etc) |