

The untold voices of science education students regarding online laboratory work

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Abstract. This research analysed the written views of science education students regarding the teaching of laboratory work using an online mode. The research was conducted using eight groups of students that consisted of 90, 250 and six groups of 200 students. The students wrote their views in the blogs created in the online system. The data was analysed thematically. The results show that students are in favour of real time hands-on laboratory work than online laboratory work.

1 Introduction

Research has demonstrated that social presence not only affects outcomes but also student, and possibly instructor, satisfaction with a course [3]. The study [3] found that students with high overall perceptions of social presence also scored high in terms of perceived learning and perceived satisfaction with the instructor [3]. The study [2] assessed the depth of online learning, with a focus on the nature of online interaction in four distance education course designs. The study [2] found that design had a significant impact on the nature of the interaction and whether students approached learning in a deep and meaningful manner. Structure and leadership were found to be crucial for online students to take a deep and meaningful approach to learning. [1] investigated the extent to which evidence of collaborative learning could be identified in students' textual interactions in an online learning environment. The study [1] revealed that there is substantial evidence of collaboration, but that there are differences between conventional face-to-face instances of collaborative learning and what occurs in an asynchronous, networked environment.

Due to insufficient research on the views of students on the online laboratory work. The focus of this research was to analyse views of distance education students regarding online science laboratory work. The research looked at (i) what are the students views regarding the implementation of online science laboratory work (ii) what are the challenges facing the implementation of online science laboratory work. (ii) what are the perceptions of students regarding online science laboratory work. (iv) what are the benefits of online science laboratory work.

2 Methodology of Research

The research is qualitative. In order to analysis the data, the data were first printed and hard copies were used. The data was read several times and key concepts and ideas were highlighted. Themes and patterns were identified to describe the situation. Coding as a process of organising and sorting data was used.

3 Results

The students argue that science can only be learnt through actively doing experiments. Therefore doing it online will be a challenge to students. It is the student's view that it is impossible to learn something that you have never seen or touched. In addition, students say that laboratory work is meant to be hands-on. Students therefore argue that science is learning by doing and it is not possible by online learning. However one of the students mentioned that since technology is at our disposal online laboratory work can be possible.

Students in favour of online laboratory work argue that access to the internet can be a challenge, especially to rural schools. This finding is not surprising as many of the students in the rural areas experiences challenges in accessing basic resources. Access to the internet may only be available to the selected few. In addition, one students highlighted the financial challenges related buying data bundles to access the internet. However, students commented that if resources are provided online laboratory work would be possible.

4 Conclusion

While some of the students are in favor of online science laboratory work. Students argue that the online laboratory work should be supplemented by the traditional laboratory. The student's argument is that even if science is done online, students would still like to have a feel of the real time laboratory work. Overall, the students argue that online laboratory can be of great value in schools that do not laboratories.

References

- [1] D.D. Curtis and M.J. Lawson. Exploring collaborative online learning. *Journal of Asynchronous learning networks*, **5**(2001) 21-34.
- [2] D.R. Garrison and M. Cleveland-Innes. Facilitating cognitive presence in online learning: Interaction is not enough. *The American journal of distance education*. **19**(2005) 133-148.
- [3] J. Richardson and K. Swan. Examining social presence in online courses in relation to students' perceived learning and satisfaction, 2003.