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## Advantages of Online Learning in Design and Technology

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## About the Author

**Sally Filtness** is a Head of Butters House - Senior for Butters and has been a senior pastoral carer at Barker College since 2002. She has a Master's degree in Technology Teaching and is a Nationally Accredited Highly Accomplished Teacher. She has been a member of the ISTAA Experienced and Highly Accomplished Teacher Assessment Panel and she has written three textbooks on Design and Technology, Stage 4, 5 and 6. Sally is a member of the College of Teachers and is currently finishing off her Doctorate in Education based on Online Learning Resources in the Design and Technology classroom. When not doing all of the above she enjoys playing with her four year old identical twin girls, Zara and Chloe.

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# Advantages of Online Learning in Design and Technology



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## Abstract

This excerpt from a thesis will examine the use of online learning resources in the teaching and learning of senior secondary students in Design and Technology. The research investigated changes to classroom practices that occur when implementing online resources, from both teacher and student perspectives. The outcomes from this study seek to provide us with a better understanding of how teachers and students perceive online teaching and learning and its advantages.

## Advantages of online learning

When looking at advantages of online learning, it is important to look at how they apply to the secondary school environment and the Design and Technology classroom and how they could be used to improve learning environments. Through the use of online tools; technologies can be used by teachers to assist the students to monitor and guide along their own learning paths (Moyle, 2015). This is what happens in a Design and Technology classroom, the technologies are used for the teachers to 'guide' and 'monitor' and for the students; to explore, be creative and research (Knowles & Kerkman, 2014). Digital learning resources support information processing by helping students to develop mental representations through the mix of media elements presented to them. Digital learning resources include content and, sometimes, learning activities. They combine multimedia elements including text, image, video and audio to present information. Research on multimedia learning has demonstrated more positive outcomes for students who learn from resources that effectively combine words and pictures, rather than those that include words alone (Clarke & Mayer, 2011).

There are many advantages with online education including flexibility with time and place, the flexibility of pace of learning, the range and variety of study options, the variety of forms of online material, the self-directed nature of online learning, and the provision of an authentic environment for learning. Studies by Song and Hill (2007) have shown that the context where learning takes place (at home or at school) influences the level of learner autonomy that is allowed in the specific context, as well as how a learner utilises resources and strategies, becomes motivated to learn, and integrates self-directed learning is significant. This is particularly true in online learning contexts, a relatively new area of exploration. Furthermore, Means, Toyama, Murphy, Bakia & Jones (2009) see the clear advantages of online study and learning is that it enhances the learner's control of their interactions with media and prompting learner reflection. Studies indicate that the triggers that increase learner activity or reflection and self-monitoring of understanding are effective when students pursue online learning as individuals (Biggs & Tang, 2011).

Online education removes the constraints of time and place with instruction available

when the learners want it and at an unlimited number of locations (Bartley & Golek, 2004). Students can learn in a convenient location when engaged in online education as long as they have access to a PC or a device and then the Internet. Students can also choose a location that is comfortable to them as well as the classroom and home (Simons, Baron, Knically, & Richardson, 2002). This is advantageous because learning can happen anywhere: bus, training field, train, home or classroom (Wright, Hoay, Mukami, & Priyadarshini, 2015).

Learning online means students can choose to learn at their own pace and at their own speed. Porter and Calder (2004) & McGee (2002) support this statement finding that in an online environment, students can access, read, hear or view the web-based material repeatedly as necessary. This is particularly beneficial for students with learning disabilities or for whom the course they are taking is not in their first language. With an increasing and overwhelming amount of information available on the Internet on just about any subject, students can learn about topics that are not covered thoroughly in their classroom (Johnson, 1984; Porter & Calder, 2004).

From the learner perspective, online education offers students the opportunities of pursuing a range and variety of study options that would not otherwise have been possible due to geographical, time or financial constraints (Means et al., 2009). Online education also opens a wider range of choices where students may choose to be associated concurrently with multiple educational providers and modes of instruction according to their needs (Twigg, 2003).

Online learning provides opportunity for students to become self-directed in their studies (McGee, 2002; Porter & Calder, 2004). When navigating Web-based learning material, students have full control over the sequence of pages they wish to access and to make decisions on what information is deemed to be important and what can be skimmed. In other words, they can tailor their learning to their interests and apply the information that suits their situation (Schiefele, 1991). Research claims that the Internet facilitates collaboration, interactivity and project based learning and provides an authentic environment for learning (Kreijns, Kirschner, & Jochems, 2003; Liaw, Huang, & Chen, 2007; Warschauer, 1997).

Looking historically at the work of Alpert and Bitzer (1970), the introduction of any major new technology into the educational process will undoubtedly raise questions on the part of some educators concerning the possible negative impact of an inanimate tutor on the very human processes of learning and teaching. They state:

*Similar questions may well have been raised when the printing press and inexpensive paper were introduced into the educational process in the 15th century. It was not long, however, before the technology of the printed page became so identified with education that the library became the universal symbol of educational excellence. We believe that the resulting explosion of knowledge and of information has made the introduction of computer-based education all the more needed in a rapidly changing world.*

This historical hesitancy to take up technology tells us about our situation today (Gerver, 2014). Interestingly, Suppes (1966) predicted the impact that ICT would have on our education system 30 years before it occurred. He observed that machines were able to deal with many kinds of information at high speed and in large quantities which would change the way in which they could be used. He suggested that the development of machine technology would result in greater personalisation of education for students:

*This is perhaps nowhere truer than in the field of education. One can predict that in a few more years millions of school children will have access to ... the personal services of a tutor as well-informed and responsive as Aristotle.*

This has certainly been one of the advantages of ICT in education as students can tailor their education in terms of their time, location, mode of communication and choice of provider with 'e-moderators' that make education more 'focused and productive' (Salmon, 2003).

As a Design and Technology (DT) teacher for twenty years at Barker College, I have been able to apply this research in my classroom and to share with my colleagues, faculty and greater teaching community. Some examples of online learning that has been used in the Design and Technology classroom could consist of using Fusion 360 and being able to collaborate with Computer Aided Design (CAD) files, Canvas used as a Learning Management System (LMS), using Canvas for quizzes, discussion and chats for Senior DT classes and tutorials and software demonstrations have now been placed on the LMS to aid students in a greater understanding of the software. The benefits of these online learning tools is a greater, richer learning experience and environment for all students who choose Design and Technology as a course in Stage 5 and 6.

## References

- Alpert, D., & Bitzer, D. L., 1970. Advances in computer-based education. *Science*, 167(3925), 1582-1590.
- Bartley, S. J., & Golek, J. H., 2004. Evaluating the Cost Effectiveness of Online and Face-to-Face Instruction. *Educational Technology & Society*, 7(4), 167-175.
- Biggs, J., & Tang, C., 2011. *Teaching for quality learning: What the student does*: McGraw-Hill Education (UK).
- Clark, R., & Mayer., 2011. *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning*: John Wiley & Sons.
- Gerver, R., 2014. *Creating tomorrow's schools today: education-our children-their futures*: Bloomsbury Publishing.
- Johnson, D. W., 1984. *Circles of learning. Cooperation in the classroom*. Alexandria, VA: ERIC.
- Knowles, E., & Kerkman, D., 2014. *An investigation of students' attitude and motivation toward online learning*. Center for Excellence in Teaching and Learning.
- Krejins, K., Kirschner, P. A., & Jochems, W., 2003. Identifying the pitfalls for social interaction in computer-supported collaborative learning environments: a review of the research. *Computers in human behavior*, 19(3), 335-353.
- Liaw, S. S., Huang, H. M., & Chen, G.-D., 2007. Surveying instructor and learner attitudes toward e-learning. *Computers & Education*, 49(4), 1066-1080.
- Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K., 2009. *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. US Department of Education.
- McGee, P., 2002. Web-based learning design: Planning for diversity. *USDLA Journal*, 16(3), 39-50.

- Moyle, K., 2015. School policies, leadership, and learning with technologies: an international comparative study.
- Porter, R., & Calder, P., 2004. Patterns in learning to program: an experiment? Paper presented at the Proceedings of the Sixth Australasian Conference on Computing Education. Vol. 30.
- Salmon, G., 2003. E-moderating: The key to teaching and learning online: Psychology Press.
- Schiefele, U., 1991. Interest, learning, and motivation. *Educational psychologist*, 26(3-4), 299-323.
- Simons, D. F., Baron, J. A., Knicely, K. S., & Richardson, J. S., 2002. Online learning: Perspectives of students and faculty in two disciplines-occupational therapy and teacher education. *Occupational therapy in health care*, 14(2), 21-52.
- Song, L., & Hill, J. R., 2007. A conceptual model for understanding self-directed learning in online environments. *Journal of Interactive Online Learning*, 6(1), 27-42.
- Suppes, P., 1966. *The uses of computers in education*: Freeman.
- Twigg, C. A., 2003. Models for online learning. *EDUCAUSE review*, 28-38.
- Warschauer, M., 1997. Computer-mediated collaborative learning: Theory and practice. *The Modern Language Journal*, 81(4), 470-481.
- Wright, C. R., Hoay, G. L. P., Mukami, D., & Priyadarshini, A., 2015. *Establishing Learning Centres Anywhere: Keys to Success*. Centre for Learning Design and Development, Athabasca University.





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