

# Learning in Commons: Investigating the impact of a social network on the the learning of technology graduate students.

Gerald Ardito  
Pace University School of Education  
United States of America  
gerald.ardito@gmail.com

**Abstract:** Learning is both personal and social at the same time. In order to investigate the impact on learning and social behaviors of graduate level educational technology students, a social network, Pace Commons, was developed using Elgg software. During the study, students participated in an online course, "Computer Science for Teachers" which was conducted solely in Pace Commons. Findings suggest that students engaged in meaningful and productive collaborations and interactions while meeting the requirements for the course. In addition, analysis of their types, frequencies, and content of student responses indicates that the teacher presence described in the Communities of Inquiry model was distributed across these students.

## Introduction

Learning is both personal and social at the same time. John Dewey and C.S. Pierce understood this and discussed this phenomenon in terms of a community of scientific inquiry (Dewey, 1980; Peirce, 2012). Entire sets of pedagogical practices, collected under the term Constructivism are founded on this insight, as well (Anderson & Kanuka, 1999; Fosnot, 1996). New computer based communications technologies, such as social networks, extend and deepen this formulation (Dron & Anderson, 2014; Fer, 2016). This study seeks to investigate the impact of social networks on the autonomy and learning of teacher candidates in a graduate teacher preparation program.

## Literature Review

A good deal of research has focused on investigating Communities of Inquiry. Garrison and his colleagues extended this model into the understanding of online settings (Garrison, Anderson, & Archer, 1999). This model describes three learning "presences:" teacher presence, cognitive presence, and social presence, which. This model is illustrated in Figure 1.

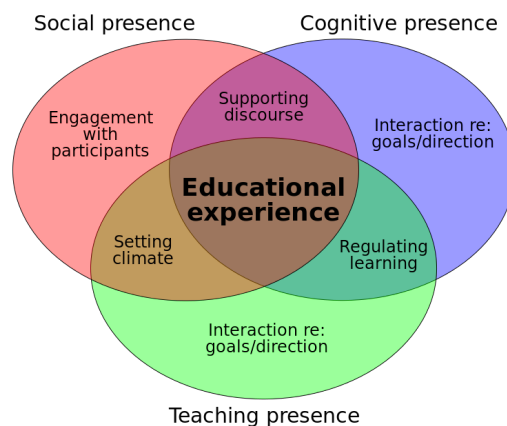


Figure 1: Communities of Inquiry Model (Garrison, Anderson, and Archer via Matbury).

Teacher presence refers to the design and organization of the learning environment. Cognitive presence refers to the cognitive processes associated with learning, such as exploration, research, and application of new ideas. Social presence refers to connectedness, highlighting factors such as group cohesion and affective expression. This research has suggested

that when these three presences are realized in online settings, that deep learning and participation can take place. Garrison's formulation of Communities of Inquiry in online settings . .

Jon Dron and Terry Anderson have extended this work on Communities of Inquiry to explore the role of social networks in learning (Anderson & Dron, 2010; Dron & Anderson, 2014; Dron & Ostashewski, 2015) explored the role of social networks in learning. This work focused on the benefits that social networked environments add to the autonomy available to learners in these settings. Social networked learning environments can greatly add to student choice, particularly in the areas of access to time, space, pace, medium, content and access (Paulsen, 1993, 2008). This work could be in contrast to the structures and strictures afforded by more typical learning management systems, which are modeled on traditional physical educational settings (Jon Dron, 2016).

There is a gap in the research around these topics in that little research has been done to explore the use of online learning with teachers and teacher candidates.. Therefore, this study was designed to address the following research questions: 1) How do students new to learning in social networks actually work together in a social network and 2) What happens to the role of teacher in this social network setting.

## **Method**

### **Context**

During the Spring 2016 semester, Pace University's School of Education offered a new course, "Computer Science for Teachers," as part of its Educational Technology Masters program. This program is primarily for certified teacher to do graduate level work in Educational Technology, while earning a masters degree and an additional New York State teacher certification.

### **Participants**

The participants in this study were the 15 students in course. There were 11 women and 4 men. Only three students had any prior experience with computer programming or robotics, and none had taught these topics to students before. One of these students worked in a museum environment, the other worked in schools. Of those in schools, one worked in a private school, the others in public school settings. Of all those educators working in schools, all had less than five years experience in education.

### **Pace Commons**

This study was inspired by work done by Jon Dron and Terry Anderson on The Landing, a social network created by them for their institution, Athabasca University (John Dron & Anderson, 2014), in addition to work demonstrating the freedom possible in this type of learning environment (Dron & Ostashewski, 2015; Dron, 2016).

For their work on the Landing, Dron and Anderson choose Elgg, which is open source software for social networking. As with other social networks (e.g. Facebook) Elgg allows users to form group, write blogs, create wikis, share photos, videos, and bookmarks, and create Pinterest-type pinboards. Dron and Anderson report choosing Elgg because of the flexibility it has regarding access. Whenever one posts anything in Elgg one can choose whenever it is visible on ly to oneself, to other logged in users, to members of particular groups, or to the public. In addition, these settings can be changed at any point for that post, so that something that had been creating only for a group could be shared with anyone on the internet at a later time.

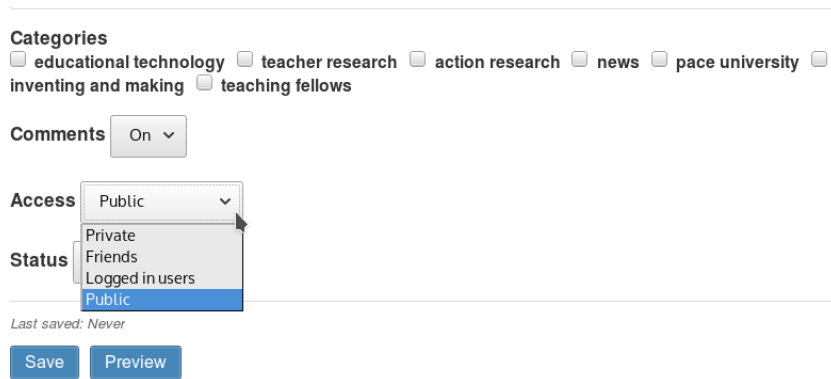


Figure 2. Access menu in Pace Commons.

Figure 2 is a screenshot depicting this functionality. The social network created for this study, Pace Commons, took advantage of the same capabilities and for the same reasons.

### Computer Science for Teachers

The course took place on Pace Commons throughout the 14 weeks of the Spring 2016 semester. The goal of this course was to expose these teachers to the theory and practice of teaching with and through computer science. The syllabus included units on the history of computer science in education, block based programming, text based programming in either Python or HTML, and robotics, and the students were required to demonstrate proficiency in each of these areas. Generally, this was a new experience for them as most online courses at Pace University take place in Blackboard, with its highly structured learning management structure.. Almost none of the students had prior experience learning via a social network. Two of the students in this course had been in a prior course which also utilized Pace Commons.

The coursework required students to post work, reflections, photos, useful bookmarks, and anything else that they wanted to share with one another via Pace Commons. Coursework and projects were designed to allow the most freedom possible for the students, a feature that has been demonstrated to increase intrinsic motivation and performance (Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009; Ste-Marie, Carter, Law, Vertes, & Smith, 2015; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004).

An example will be illustrative. For the unit in Robotics, students were provided with resources to support the platform they were using (Makeblock). They were asked to review those resources and to learn from a set of introductory lessons. Then, to demonstrate their proficiency, they were to program their robots to dance for a least two minutes to a song of their choice. They would then upload to Pace Commons both the code they had created as well as a video of their robot actually dancing. Students were further asked to create blog posts on Pace Commons that captured their process of learning with the robots. This was the typical structure for all the projects in this course. They were designed to allow for the maximum student choice and participation, as research has indicated that these are key factors in motivation, participation, and learning (Egberink, Gijlers, & Saab, 2015; Grace, 2015).

### Data Collection and Analysis

Student interactions for this course on Pace Commons were the data collected and analyzed for this study. These interactions include all of the posting shared by the participants throughout the course, including: blog posts, comments to the instructor and other students, discussions, shared photos, and shared bookmarks. These interactions were examined both in terms of content (what is being said) and transactional direction (to whom is it being said). These interactions were then evaluated to explore any relevant trends or patterns.

### Findings

This study was designed to investigate the impact of the implementation of a social networking platform for learning (Elgg) on the learning, interactions, collaboration, and role of the teacher in a graduate level educational technology course which sought to expose teachers to teaching with and through computer science. Student work and interactions were examined in order to explore the research questions. The section will discuss the findings of the study.

## Types of Interactions

All of the postings for this course on Pace Commons were collected and analyzed to determine the transactional direction. There were two fundamental types of transactional directions – *teacher to student* and *student to student*. As might be expected in a graduate level course, a preponderance of the student to teacher transactions had to do with the assigning of course work and answering related questions. There were two types of student-student interactions. The first was about *sharing* with others about the process of learning. Much of this was assigned as coursework, but some of these interactions arose spontaneously. The second type of student-student interactions were those where the *students offered and requested support* from one another. It is important to note that these interactions These more spontaneous interactions were correlated with times of high engagement in projects, especially the Robot Dance Off Challenge. It is important to note that further quantitative analysis of these interactions is required, but is outside of the scope of this paper.

## Student-Generated Actions

However, there were also student-generated actions where the course members went well beyond the work required for the course. Two examples will be illustrative. Donna (pseudonyms used throughout) is a special education student working in a high needs school with adolescents who have extreme disabilities. As she started to work with her robot, she intuited that this would be a powerful learning experience for one of her students with autism, effectively making him her partner in the course. Her postings on Pace Commons reflected this partnership and focused not just on her learning but his as well. Geena reported being so inspired by the programming she learned to do that she immediately built a project to use with her adolescent math students.

In both cases, these opportunities arose spontaneously and organically. These students invented them and implemented them without seeking approval or consent from the instructor. In this instructor's experience, these are very rare occurrences, especially in work done in more typical learning management systems.

## Discussion and Conclusions

This study was designed to investigate the impact of the implementation of a social networking platform for learning (Elgg) on the learning, interactions, collaboration, and role of the teacher in a graduate level educational technology course which sought to expose teachers to teaching with and through computer science. A social network called Pace Commons was created using open source Elgg software. Student work and interactions were examined in order to explore the research questions. The section above discussed the findings of the study. This section will attempt to draw some conclusions.

## Adoption of Pace Commons

Despite effectively no prior experience with using a social network for learning, along with extensive experience in using a traditional learning management system (Blackboard), the participants in this course embraced and adopted the Pace Commons platform. Almost immediately, students conducted essentially all communications about the course via Pace Commons (via the formal postings discussed about or via its messaging service), instead of the more typical emails. It should be noted that this happened via modeling by the instructor and not via any formal training or statements of community norms and expectations.

## Distribution of Teacher Presence

The Communities of Inquiry model describes three “presences” that form effective online learning experiences – teacher presence, social presence and cognitive presence (Garrison, 2016; Garrison et al., 1999). The interactions in the Computer Science for Teachers course conducted via Pace Commons in this study, suggest that this type of social networking learning environment is supportive of a distribution of the teacher presence across the participants of the course. While work in the course was planned and instigated by the instructor, the students worked on their own and with one another to ask and answer questions and to take the initiative to extend work to meet their own needs.

This is evidenced chiefly in two sets of data. The first is the rich series of interactions that took place throughout the Robotics Dance Off Challenge project. During this project, which the students reported as being both challenging and rewarding, students enthusiastically shared their accomplishments in coding their robotic dances, as well as offering and requesting support from one another. It is worth noting that these helping interactions emerged spontaneously. The second

set of data includes the outlier actions discussed above, such as Donna's decision to include one of her autistic students directly in her robotics work and Geena's decision to create a new unit for her math students based what she was learning in the course as she was learning it.

These two sets of emergent phenomena suggest both the power of a social network for learning, as well as the student-instigated assimilation of the teacher presence. These interactions were not the result of students seeking permission or guidance from the instructor. Rather, these interactions arose from such an autonomy-supportive environment, as predicted by Self-Determination Theory (Deci & Ryan, 2012).

### Implications for further research

These findings have further implications for educational research into personal learning environments. Research currently underway is investigating the impact of this type of social network on the learning and participation of graduate science education students in a face-to-face course, attempting to see if the findings of this study about the distribution of teacher presence will extend into a blended learning environment.

### References

- Anderson, T., & Dron, J. (2010). Three generations of distance education pedagogy. *The International Review of Research in Open and Distributed Learning*, 12(3), 80–97.
- Anderson, T., & Kanuka, H. (1999). Using constructivism in technology-mediated learning: Constructing order out of the chaos in the literature. *Radical Pedagogy*. Retrieved from [http://www.radicalpedagogy.org/Radical\\_Pedagogy/Using\\_Constructivism\\_in\\_Technology-Mediated\\_Learning\\_\\_Constructing\\_Order\\_out\\_of\\_the\\_Chaos\\_in\\_the\\_Literature.html](http://www.radicalpedagogy.org/Radical_Pedagogy/Using_Constructivism_in_Technology-Mediated_Learning__Constructing_Order_out_of_the_Chaos_in_the_Literature.html)
- Deci, E. L., & Ryan, R. M. (2012). Motivation, personality, and development within embedded social contexts: An overview of self-determination theory. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (pp. 85–107). New York: Oxford University Press Oxford. Retrieved from [https://books.google.com/books?hl=en&lr=&id=YU8IpnTnQasC&oi=fnd&pg=PT104&ots=5OGNxf\\_rhE&sig=CmSbqQGwPnR\\_4g5HzRY6wEmH-MQ#v=onepage&q&f=false](https://books.google.com/books?hl=en&lr=&id=YU8IpnTnQasC&oi=fnd&pg=PT104&ots=5OGNxf_rhE&sig=CmSbqQGwPnR_4g5HzRY6wEmH-MQ#v=onepage&q&f=false)
- Dewey, J. (1980). *Logic: The Theory of Inquiry* (New York: Holt, Rinehart and Winston, 1938). *The development of laissez faire doctrine in classical economics and its failure to deal with the Great Depression, the period of Keynesian dominance stretching from the 1930s through the 1960s, and the reappearance of a conservative individualism in econ.* New York: Holt, Rinehart, and Winston.
- Dron, J. (2016). p-Learning's unwelcome legacy. *TD Technologie Didattiche*, 24(2). Retrieved from <http://www.tdjournal.itd.cnr.it/article/view/891>
- Dron, J., & Anderson, T. (2014). Agoraphobia and the Modern Learner. *Journal of Interactive Media in Education*. Retrieved from <http://rilib.pace.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1034716&site=eds-live&scope=site>
- Dron, J., & Anderson, T. (2014). *Teaching crowds: Learning and social media*. Edmonton, Alberta: Athabasca University Press.
- Dron, J., & Ostashewski, N. (2015). Seeking connectivist freedom and instructivist safety in a mooc. *Educación XXI*, 18(2).
- Egberink, A., Gijlers, H., & Saab, N. (2015). The Effect of Task and Collaboration Support on Learning Processes and Learning Results in a CSCL Environment. In *11th international conference on computer supported collaborative learning*.
- Fer, S. (2016). The effectiveness of the model of “social constructivist learning environment” design through research. *Global Journal on Humanities and Social Sciences*.

- Fosnot, C. T. (1996). *Constructivism. Theory, Perspectives, and Practice*. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED396998&site=ehost-live>
- Garrison, D. R. (2016). Cognitive presence for effective asynchronous online learning : The role of reflective inquiry , self-direction and metacognition COGNITIVE PRESENCE FOR EFFECTIVE ASYNCHRONOUS ONLINE LEARNING : THE ROLE OF REFLECTIVE INQUIRY , SELF-DIRECTION AND METACOGNI. *Elements of Quality Online Education: Practice and Direction*, 4(June), 47–58.
- Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. *The Internet and Higher Education*, 2(2), 87–105. [http://doi.org/10.1016/S1096-7516\(00\)00016-6](http://doi.org/10.1016/S1096-7516(00)00016-6)
- Grace, L. (2015). *The effects of a technology-enhanced, flexible choice science program on achievement, self-efficacy and the scale learner progression mechanism in science*. Southern Connecticut State University. Retrieved from <http://gradworks.umi.com/36/63/3663830.html>
- Paulsen, M. F. (1993). The hexagon of cooperative freedom: A distance education theory attuned to computer conferencing. Retrieved April 10, 2016, from [http://www.prof2000.pt/users/ajlopes/AF22\\_EAD/teorias\\_ead/Teorias\\_Paulsen.htm](http://www.prof2000.pt/users/ajlopes/AF22_EAD/teorias_ead/Teorias_Paulsen.htm)
- Paulsen, M. F. (2008). Cooperative online education. In *Seminar. net: Media, Technology & Lifelong Learning* (Vol. 4, p. 2).
- Peirce, C. S. (2012). *Philosophical writings of Peirce*. Courier Corporation.
- Sierens, E., Vansteenkiste, M., Goossens, L., Soenens, B., & Dochy, F. (2009). The synergistic relationship of perceived autonomy support and structure in the prediction of self-regulated learning. *British Journal of Educational Psychology*, 79(1), 57–68.
- Ste-Marie, D. M., Carter, M. J., Law, B., Vertes, K., & Smith, V. (2015). Self-controlled learning benefits: exploring contributions of self-efficacy and intrinsic motivation via path analysis. *Journal of Sports Sciences*, 1–7. <http://doi.org/10.1080/02640414.2015.1130236>
- Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivating learning, performance, and persistence: the synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology*, 87(2), 246.