Chang, M. et al. (Eds.) (2019). Proceedings of the 27th International Conference on Computers in Education. Taiwan: Asia-Pacific Society for Computers in Education

The Discourse of Pre-service Teachers on Designing an Online Learning Course

Chih-Hui SEET*, Chuan-Chih CHIANG, Huang-Yao HONG
Department of Education, National Chengchi University, Taiwan
*105152014@mail2.nccu.tw

Abstract: This study aims to understand the collaborative discourse of the preservice teachers on their customly designed online learning course. The participants were 38 pre-service teachers from a teacher education program in Taiwan. Using a design-oriented instructional approach, two iteration of design thinking activities were scaffolded to help the participants work on their online course projects. To this end, the participants discussed how to design their online course/project in a knowledge building environment in which they were encouraged to generate and optimize their design ideas. Data mainly came from online discussion through posted notes. The findings indicate that although the number of posts is few, the design ideas in these posts showed some quality improvement. At the end of the course, it was also found that all groups were able to design interesting learning contents and activities personalized for their target students' online learning use for addressing some real-life problems.

Keywords: knowledge building, discourse, design thinking, personalization, online learning course

1. Introduction

The emergence of technology and big data brings us into a more convenient, personalized world that supplies more customized, ubiquitous services and products for today's digital natives. This context has also seen changes in education, from a more traditional teacher-centered pedagogy into a new technology-assisted, student-centered direction based on collaborative learning (Hargreaves, 2018; Persson, 2005; Schleicher, 2012). In Taiwan, the K-12 system and its new course outline now emphasize the cultivation of students' 21st-century core skills, especially in technology, similar to that of STEM education (Cheng, 2017; National Academy for Educational Research, 2019). Given that the direction of future education will focus on deep and transferable learning with aptitude based on related skills or knowledge, such a vision aims to develop students who can learn and apply knowledge elastically and hopefully achieve the habits of lifelong learning.

Consequently, teacher training institutions should seek to stimulate learners and transfer or strengthen their instructional design skills using particular digital resources. We believe that the roles of teachers of the future will be to operate as instructional designers, curriculum designers and learning guides, regardless of whether they are inside or outside the simulated world. Indeed, their work will involve creating interesting, customized and useful learning content for others to learn either independently or spontaneously (Grant & Basye, 2014). This study aims to understand the collaboration process enacted by pre-service teachers in designing a personalized online learning course in a knowledge-building environment and design thinking context. The research questions are: *(1) How were their discourses connected when applying a design thinking scaffold and when working in a team-based knowledge-building environment? (2) What were their main points of discussion and core values while designing an online learning course for future learners? (3) What were the final products/ design outcomes of their online learning course?*

2. Methods

2.1 Participants

This study adopted a design research method with two iterations of design thinking activities. The participants comprised 38 student teachers from a teacher education center in Taiwan, most of whom were at the sophomore level. Half had no previous relevant experience of being in a knowledge-building or student-centered class.

2.2 Instructional Design

In the two iterations' design thinking activities, the participants were divided into 10 groups, each with a leader, and were asked to design an online learning course that was directed more toward personalization and that could relate to students' daily activities. The aims of the activity were to develop participants' (pre-service teachers') ideas and to cultivate their design ability in order that they would be able to solve some structural problems that can be found on other online learning courses, such as all content being rote learning that learners cannot practice in real-world situations even where they own the "knowledge."

All of the teaching subject of the courses and targeted learners were freely determined by the participants, although they were required to design at least 150 minutes of online learning activities. The participants were encouraged to develop their ideas and work collaboratively in a computer-supported knowledge-building environment called Knowledge Forum 6 (KF6).

2.3 Instruments/Data Collection

All data were auto-recorded on the KF6, containing the discussion process of the participants, the learning plan and the final online learning course interface designed by each group. The discussion posts were then run on an analysis using the Knowledge Building Discourse eXplore (KBDeX) application, while the designed learning plans and interfaces were analyzed qualitatively.

3. Results

Research question 1: *In the process of designing the online learning courses, the participants held quite considerable discussions even where this was their first time learning through such knowledge-building environment/courses. Their performance on the KF6 included two main actions (read and modified note) displayed below in Table 1, which were integrated with the design thinking scaffold (the process: empathy, define, ideate, prototype, test), revealing dynamic and progressive behavior in order to construct a visionary learning product. The interaction process of the participants, extracted from their discussion posts, is shown below in Figure 1, while Figure 2 presents the personalization environment in which these participants worked collaboratively.*

Table 1 All groups' discussion performance

Group	*Discussion Post Number*	*Read Note (%)*	*Modified Note (%)*
1	*46*	*12.67*	*16.31*
2	*22*	*6.92*	*8.56*
3	*71*	*11.56*	*17.42*
4	*41*	*6.02*	*5.51*
5	*48*	*15.29*	*17.57*
6	*38*	*5.46*	*2.83*
7	*32*	*10.82*	*7.37*
8	*40*	*7.95*	*7.07*
9	*39*	*9.95*	*10.65*
10	*26*	*13.37*	*6.70*

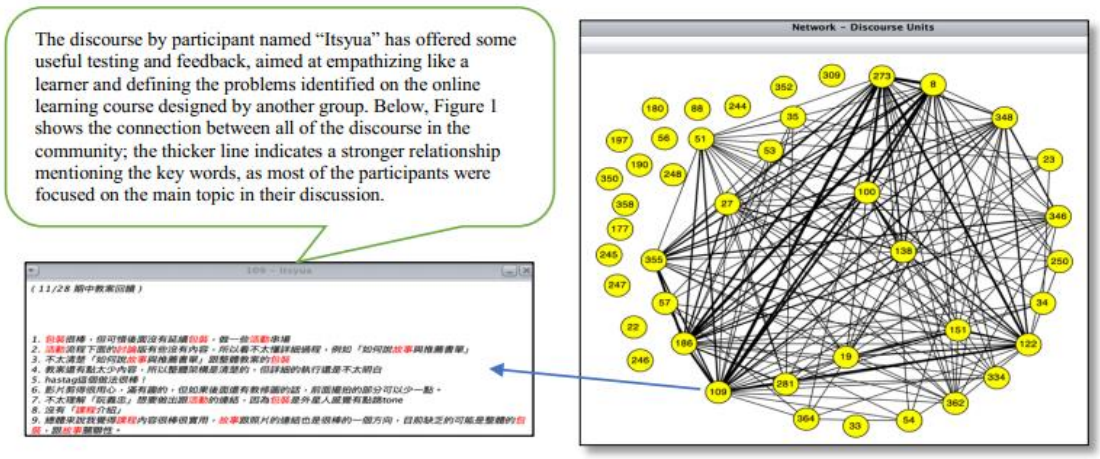

Figure 1: The discourse network in the community

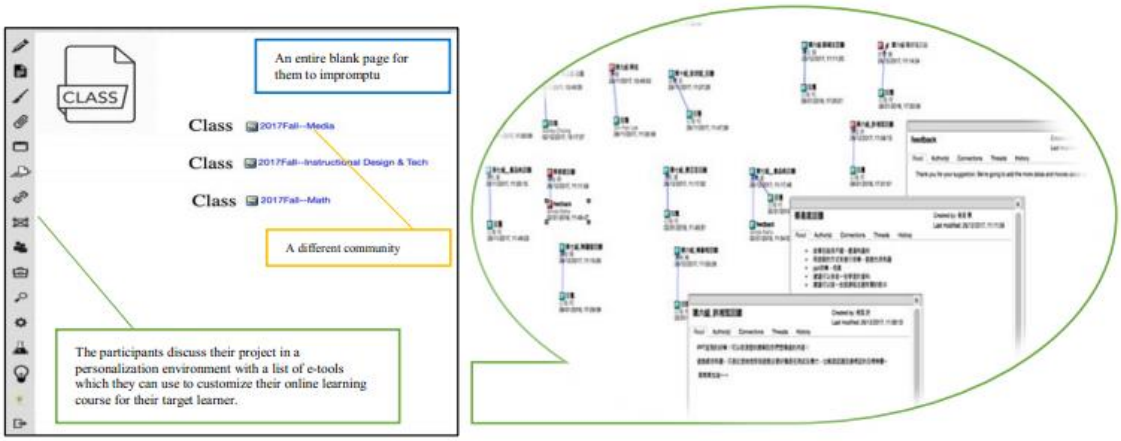

Figure 2: A personalized and collaborative working environment (left); according to the design thinking scaffold, the discussion content seems to define the problem and brainstorm the new ideas (right)

Research question 2: *Figure 3 (right) below presents the discussion result of the whole class, and the key element in the discourse covered by each group. They sought a more activities form's designated course wrapping contents with stories, tasks and games that are not only connected to learners' real lives, but are also related to what truly motivates learners. The teacher's guiding and discussion activity enables target learners to learn in a self-directed manner, hence they frame their course design using "experience," "course," "task," "story," "discussion," "life-connected," "guiding," "wrapping," "interesting," "design," "activities," "motivation," "games," and "experience." Figure 3 (left) displays the discussion post order by time, mentioning the key words above. It appears that they first discussed the desired framing of their online learning course design, followed by the construction of their different topics' contents for their individual learners.*

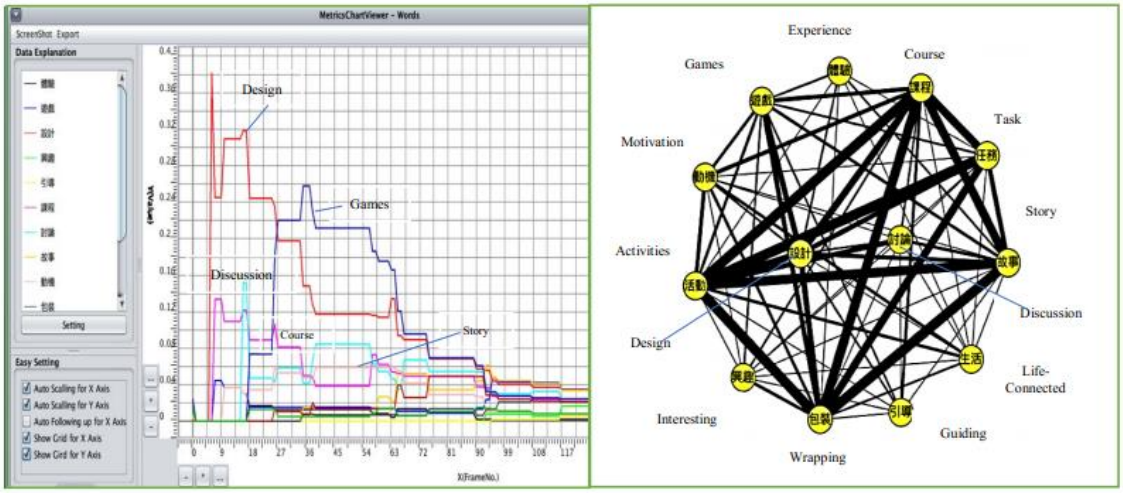

Figure 3 shows discussion core literacy (right) and the post order by time mentioning these key words (left).

Research question 3: *Figure 4 below is a small corner screenshot of one of the most representative group's online learning course interface. Their online learning course design looks like a tournament game, with different levels and tasks bringing the learner to the final destination (target of the learning). It also incorporates some important knowledge that might be adaptable in real life after the learner has completed the course, such as a safety concept and attitude.*

Figure 4: A small corner screenshot of Group 8's online learning course prototype.

4. Discussion and Conclusion

For most Asian students, it is not easy to participate in a course or environment that requires the learner to ask questions and discuss passionately or actively, because they have traditionally studied according to a teacher-centered teaching strategy. Consequently, relatively few posts were submitted in the KF6. Although the entire process of posting their discussions appeared to be rather passive, it nevertheless enabled a reasonable number of new knowledge-building learners. Further research must continue to encourage learners not to hesitate in publishing their ideas and opinions in advanced. Pre-service teachers are those who will nurture the next generation of society's pillars, and accordingly they need to improve their pedagogical knowledge time upon time. On the other hand, we found that the design thinking framework that operates in a knowledge-building environment is a great scaffold or support for

teachers to design and solve certain issues, and as they generate and advance their ideas through brainstorming, they will receive more and more feedback.

Owing to the convenience of newer technologies such as the Internet and the development of big data, future generations are today shaping themselves to become a more effective and productive nations. Relatedly, teachers are now seeking to facilitate more student-centered learning objects and instructional designs that support the comings era and 21st-century core literacy. It was encouraging to observe the discussion content produced by these participants increasingly take an active and postmodern design pattern, no longer based on rote learning, and successfully integrated with technology and notions of creativity that should meet current students' demands.

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