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Chapter 25
Smart Literacy Learning in the Twenty-First Century: Facilitating PBSL Pedagogic Collaborative Clouds

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Abstract Prevalent in the literature are the components of smart education, learning, and literacies; smart pedagogies are encouraged, but practical examples are scant. A gap between education and the workplace has been acknowledged; how can smart pedagogy fill the void? This chapter provides an example of an innovative educational process bridging the interval utilizing an online problem-based service learning (PBSL) instructional approach and a pedagogic collaborative cloud, a *smart* pedagogic collaborative cloud (PCC). Educators collaborating together are a crucial component of the changing praxis. In a university course using a PBSL approach, students collaboratively identified a problem—lack of time. A literacy pedagogic collaborative cloud was identified as the solution to the problem. A pilot study was performed ($n = 12$) to ascertain interest in the idea and warrant conducting a study. A triangulated qualitative study ($n = 45$) was implemented; a broad constructive theoretical framework provided support for smart education, PBSL, and the pedagogic collaborative cloud. The research questions were: (1) Does the interest or need exist to create a literacy collaborative cloud for graduate students and alumnae? (2) What was the best format to encourage participation? Four types of data were collected and quality checks instituted. The findings revealed 80% of the participants agreed with the creation of a literacy pedagogic collaborative cloud (LPCC); 100% of the participants preferred to collaborate with a group of professionals in their field, and 100% agreed collaboration improved teaching practice. A private literacy PCC was created on Facebook; the implications are clear—smart pedagogy can fill the university/workplace void.

Keywords Mobile learning · Pedagogic collaborative clouds · Smart learning · Problem-based service-learning

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25.1 Introduction

In the *Oslo Manual*, published by the Organisation for Economic Co-operation and Development (OECD), the definition of innovation is a novel product or process different from one previously in use (OECD 2018). Following the definition guidelines, an educational process innovation occurs when either a new or changed process for delivering services, such as "new pedagogies" or new mixes of pedagogies, is presented or new ideas are introduced, such as "changing the way educators communicate" (Vincent-Lancrin et al. 2019, p. 17). Accordingly, the literacy pedagogic collaborative cloud (LPCC) represents an example of an innovative educational process with the goal of improving education.

The OECD seeks to improve the well-being of individuals globally concentrating on solutions to common problems which in education focus on knowledge and skills needed in the future. In most OECD countries, encouraging the twenty-first-century skills represents a crucial curricular component. It is imperative educators understand how they can adjust their practice using professional development as a resource (Vincent-Lancrin et al. 2019). However, changing one's teaching and learning practices may require a change in knowledge, beliefs, or attitudes. To accomplish this, some investment is needed in the form of new knowledge production, communication, or the facilitation of peer learning through a variety of means. Fortunately, providing professional development opportunities can help educators learn new pedagogies, which is especially beneficial when the acquired knowledge is applied in their courses.

The bad news: From 2007 to 2015 innovation in formal teacher training reflected low levels of change (Vincent-Lancrin et al. 2019). The good news: According to the OECD, innovation has been robust in peer learning professional development for educators "often considered as more effective than formal training, partly because it is more strongly connected to teachers' needs. By coming together with their peers to discuss and collaborate, teachers have the opportunity to develop professionally" (Vincent-Lancrin et al. 2019, p. 238). Indeed, the largest diffusion of innovation experienced by students has been through their teachers participating in teacher peer learning professional development (Vincent-Lancrin et al. 2019). The literacy pedagogic collaborative cloud is an example of an innovation in peer learning professional development.

Illeris (2009) discussed the importance of modifying current educational practice to create a better future for the world. Now moving into the third decade of the twenty-first century, both the OECD and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) are focusing on the area of new pedagogy (Lorenzo and Gallon 2019). As cited by Scott (2015), "moving towards new pedagogy is not simply a matter of offering learners technologies they are likely to use in the knowledge society… twenty-first century pedagogy will involve engaging learners… for different kinds of knowledge practice… enquiry, dialogue and connectivity" (p. 4). Utilizing inquiry, collaboration, and connectivity, the smart world is infiltrating the field of education and impacting learners around the globe (Uskov et al. 2017).

Today, smart education, learning, environments, and pedagogy are ubiquitous. So, why not connect smart pedagogy to the smart workplace?

A Gallup–Lumina poll (2014) revealed only 11% of 623 American business leaders believed higher education graduates have the necessary skills to be successful in the workplace. The number one answer from leaders was bridging the gap between education and employment at 76.9% (Marmolejo 2018). A report from the G7 summit in Canada focusing on the new world of work stated, "educational institutions aren't… preparing students for the jobs of the future…. we are having a quiet crisis…" (Canada 2017, p. 4). To maintain focus on the smart perspective, UNESCO recommended increasing innovative smart learning environments (SLEs) (Singh and Hassan 2017) while the European Commission (2018) challenged educators to take the lead. Global leaders urged connecting higher education to the workplace (Ornellas 2018). In higher education, facilitators are the key to linking pedagogy to the workplace.

Today, educators need to be more than facilitators (Hattie 2012); they are expected to be activators (Fullan 2013b). Fullan contends assisted by digital technologies educators must assume the role of activators of innovative pedagogies. However, becoming an activator can be a challenge because broad, efficacious integration of digital technologies with professional development has not been accomplished (Gamage and Tanwar 2017). This chapter provides an example of connecting education to the workplace utilizing online problem-based service learning (PBSL) instruction and a pedagogic collaborative cloud, a *smart* pedagogic collaborative cloud.

25.2 The Smart World

Smart education is social, mobile, adaptable, and uniquely designed for the twenty-first century. The definition of smart education proposed by Zhu and He (2012) described a synergistic platform of intelligent environments utilizing smart technologies affording facilitators the opportunity to integrate smart pedagogies to empower learners. The purpose of smart education is to cultivate a workforce that discerns twenty-first-century knowledge and skills to meet the needs and challenges of the future (Zhu et al. 2016). Five aspects of smart education were identified by Kim and Oh (2014) including "comprehensive education innovation, twenty-first century teaching methods, twenty-first century skills, IT convergence, and an adaptive reform agenda" (p. 139).

Taylor (2016) identified twenty-first-century skills as "liquid skills" with the qualities of fluidity, malleability, and adaptability (p. 90). These three qualities are imperative to incorporate into the preparation of students for the changing workplaces. The workplaces of the future will change throughout students' working lives; most of the future jobs currently do not exist (Taylor 2016). Liquid skills comprise teamwork, communication, critical thinking, interactive learning, and lifelong learning. Infosys (2016) noted these skills were more important in the workplace than academic achievement. Through the adaptation of innovative new pedagogies, students

will acquire the necessary twenty-first-century skills for their future employment (Lorenzo and Gallon 2019).

Although consensus has not been reached concerning a definition of smart learning (Zhu et al. 2016), the phenomenon is often defined by the elements of collaboration, socialization, problem-solving, and critical thinking, which are also components found in twenty-first-century learning and problem-based service learning (PBSL) (Aker et al. 2018; Pentón-Herrera et al. in press). A smart learning environment (SLE) utilizing innovative technologies supports the learner by adding flexibility, interaction, adaptation, and reflection (Spector et al. 2015). SLEs allow for the needed space for the expression of innovative ideas concerning teaching and learning (Byrne et al. 2019). Ten years ago, a shift of emphasis was noted in smart environments toward learner-centered platforms (Radenković et al. 2009). Technology platforms bridge the smart learning environment and the real world through collaborative learning and knowledge exchange; in essence, the classroom is the world (Kim and Oh 2014). Utilizing a smart environment, educators can broaden their learning space using mobile devices as hardware, virtual reality as software, and the Internet. Professionals can communicate, exchange information, and progress through collaboratively learn with and from colleagues around the world.

Smart literacies, sometimes known as digital literacies (Weiland 2015), provide one component to the process which Rheingold (2012) noted can be learned. Similar to smart learning, smart literacies are also defined by component parts; Martin (2005) suggested the literacies comprised the skills of constructing new knowledge, communication, collaboration, social action, reflection, and critical thinking. Importantly, smart literacies are not a one-size-fits-all proposition; the literacies need the guidance of trained facilitators to meet the unique needs of learners. The key for facilitators activating the smart world is to construct educational encounters balancing the activity, technology, and the educative value.

Smart pedagogy is viewed as a combination of smart teaching and smart learning (Borawska-Kalbarczyk et al. 2019). Pedagogy represents the relationship between teaching and learning; pedagogical elements include content, and pedagogical and technological knowledge (Gros 2016). The intersection of the pedagogical factors provides unprecedented opportunities for teaching and learning. Technology has forever changed the role of educators who now must rethink the dynamics of the educational system in order to facilitate, coordinate, enable, and lead learning into the digital age (U.S. Department of Education 2016). Focusing on smart pedagogy affords an opportunity to highlight the importance of integrating digital tools, mobile technology, and learning platforms into the curriculum (Kaimara and Deliyannis 2019). An example of smart pedagogy is a pedagogic collaborative cloud.

Hwang (2014) provided a note of caution, "new learning modes will raise new pedagogic issues, and smart learning is a brand-new concept of learning" (p. 11). For clarification, Fullan (2013b) proposed four criteria a new pedagogy would have to meet: "(1) irresistibly engaging, (2) elegantly efficient and easy to access and use, (3) technologically ubiquitous 24/7, and (4) steeped in real-life problem solving" (p. 24). Conducting an analysis of instructional strategies, Uskov et al. (2018) forecasted the implementation of smart pedagogy both on-site and online at institutions of

higher education *in the near future*. New is often popular. It appears students possess a "strong interest in smart pedagogy" (Uskov et al. 2018, p. 3); it appears smart pedagogy will be an essential research topic over the next ten years. The future is now.

Teaching and learning have changed in format and purpose (Fullan and Langworthy 2014). The role of a facilitator is seen as leading the "students' journey through the world, not as infallible sources of knowledge" (Borawska-Kalbarczyk et al. 2019, p. 37). The aim of a facilitator is to build rapport based on trust and respect (Žogla 2019). Fullan and Pinchot (2018) advised activators to focus on pedagogy. Auerbach and Andrews (2018) delineated a framework of pedagogical knowledge for active-learning instruction including mentoring and responding to student thinking, increasing equity, motivating students, promoting metacognition, building links between tasks, and managing logistics.

Pedagogy may be the driver, but "technology is the accelerator" (Fullan et al. 2017, p. xiii) and faculty are the catalysts, the activators (Hattie 2012). Hattie analyzed over 1000 studies and found that although a *facilitator* was a more dynamic term than lecturer, the most effective term was *activator* which had an effect size of 0.72 or three times greater than the effect size of a facilitator. The relationship between a facilitator and the students was "too passive" (Fullan et al. 2017, p. 67). The preferred role for an instructor is an activator, a co-learner in an active partnership with students (Casey 2012; Newport 1906). As the key determinant in learner outcomes (Yates and Hattie 2013), educators need to learn to work together in cooperation and dialogue to get the best outcomes from learners (Caena 2014). Collaboration and sharing are a crucial part of the changing praxis; an activator accelerates change.

Change is ubiquitous in the twenty-first century; in a smart world, educators must adapt to smart pedagogy, literacies, learning, skills, and education which taken together afford students the opportunity to acquire the skills, the lifelong skills, to be successful in the future (Kaimara and Deliyannis 2019). Fullan (2007) explained the nonlinear and iterative qualities of the change process and described change as a complex labyrinth of intrinsic components. The nonlinear, interconnected world is changing educational practice. Three factors illustrate the rapidly changing nature of education: (1) concentration on twenty-first-century skills; (2) increased technology; and (3) student collaboration, mobility, and self-reliance (Žogla 2019). Higher education is recommending courses incorporate authentic problems and encourage internships (Juaneda-Ayensa et al. 2019). In K-12 education, an instructional shift is moving from focusing on individual disciplines to instructing key competencies and twenty-first-century skills (Byrne et al. 2019). Educators, by combining pedagogy and technology, move to the driver's seat to create change (Fullan 2013a). However, there is a problem; education incorporates change slowly, and smart pedagogy changes even slower (Kinshuk et al. 2016). Pressure on pedagogy is being applied by the fast-paced world.

Smart education reinforces learner-centered, constructivist learning (Bognar et al. 2019). Indeed, many current smart educational reforms concentrate on instructional strategies from a constructivist perspective (Cuban 2013). When instructors adopt constructivist pedagogy, learning becomes student-centered, collaborative, and

focused on solving real-world problems (Zhao et al. 2015). In constructivist learning environments, facilitators guide students constructing knowledge through inquiry, reflection, and experience.

The roots of farsighted smart education are reflected in the past—in the works of Freire (2009), Vygotsky (1978), and Dewey (1938). Freire, Dewey, and Vygotsky recommended placing pedagogy in the hands of skilled facilitators, while Dewey advised educators that students learned best by adding to their own experience and constructing shared experiences. This foundation provided by the trio supports not only smart learning, PCCs (pedagogic collaborative clouds), but also twenty-first-century learning. The theoretical framework supporting PCCs is built on specific types of constructivism: cognitive, social, transformational, and nonlinear (Aker et al. 2018). Cognitive constructivism supports collaborative learning (Ng et al. 2010); social constructivism supports mobile learning (Luckin 2010); transformational constructivism supports the facilitation process (Kroth and Boverie 2009); nonlinear constructivism supports twenty-first-century learning (Aker 2018, 2019) and taken together provides broad support for pedagogic collaborative clouds.

The literacy pedagogic collaborative cloud represents an online mobile collaborative community. As higher education works to preserve and develop the online student sector, optimizing courses for mobile learning is imperative. According to Magda and Asianian (2018), 36% of potential online college students desire to complete their studies online using a mobile device; 44% of online students conduct most of their research on a mobile device; and 99% of online college students own a mobile device. Assessing the data, "it is no longer a question whether we should use these devices to support learning, but how and when to use them" (Trotter 2009, p. 1). Mobile social media provides seamless learning (Seifert and Har-Paz 2018) by innovatively offering extended collaboration by combining learning and technology (Yeh and Swinehart 2018). Finally, in a study of social media collaboration, Razmerita and Kirchner (2014) found students had no difficulty using online collaboration sites and benefitted from the experience. Additionally, collaborative mobile learning provides flexibility (Sulaiman and Dashti 2018), spontaneous learning (Ariyanto et al. 2018), and social interactivity (Hernández-Lara et al. 2018). Unfortunately, a dearth of the literature exists in the area of pedagogic collaborative clouds; the literacy pedagogic collaborative cloud fills a gap. According to the AEA 267 (2007), ascertaining gaps between the current reality and the desired state facilitates the process of change.

25.2.1 Pedagogic Collaborative Cloud (PCC)

Social media is transforming the dynamics of informal professional development with Facebook being the most popular social networking site (Staudt et al. 2013). The Facebook platform is communicative, collaborative, and user-centered (Limbu 2012) and conducive to finding solutions to given problems (Lampe et al. 2011). Concerning social media, Lopez (2012) posited, we have entered "a new frontier of human experience… [in a] rapidly changing world" (p. 28). Facebook not only

enhances collaboration, but also builds trust (Chang and Lee 2013). Facebook can be used as a tool to facilitate discussions, distribute resources, make announcements, provide peer feedback, and achieve educational success (Mazman and Usluel 2010). The role of educators is changing not only in the classroom, but also in pedagogic collaborative environments (Issa and Kommers 2013).

Patahuddin and Logan (2019) investigated Facebook as an information professional learning platform focusing on pedagogical and mathematical knowledge. The study provided evidence that Facebook supports informal professional development. Van Bommel and Liljekvist (2016) posited "teachers [can] initiate and orchestrate their own professional development on the Internet" (p. 1). Rutherford (2010) explained social media offered teachers an encouraging, participatory, practical, collaborative, and dynamic environment helping teachers' professional development. Finally, Manca and Ranieri (2017) stated, "Social Media tools are seen by many… as powerful drivers of change for teaching and learning practices" (p. 216). Staudt, Clair, and Martinez found Facebook not only was the most popular place for socializing, but could provide long-term professional development and continuous support, becoming a "notable professional forum" (p. 68).

25.2.2 Background of the Study: Problem-Based Service-Learning

The idea of creating a Facebook professional forum began simply as a problem. Smart education reinforces learner-centered, collaborative learning, which often focuses on solving authentic problems. Problem-based service learning represents an instructional strategy incorporating student-centered instruction, collaborative learning, and solving authentic problems guided by service learning and civic engagement reinforcing twenty-first-century workplace skills (Aker et al. 2018; Pentón-Herrera et al. in press). Due to the flexibility of the approach, PBSL (problem-based service learning) can be incorporated in practically any course. In a PBSL class, the students collaboratively identify and select a problem, learn about the problem, conduct research, reflect, find a solution, and take action. The problem the PBSL collaborative group focused on was time or rather the lack of it as K-12 educators. The literacy pedagogic collaborative cloud was identified as the solution to the problem.

25.2.3 Literacy Pedagogic Collaborative Cloud

While instructing the second to last class in a Midwest University, Master of Arts in Reading Education program, the students—all of whom were practicing K-12 teachers—still had many questions concerning literacy. Due to rapid changes affecting pedagogy: Common Core State Standards (CCSS), Next Generation Science

Standards (NGSS), multiliteracies, multimodalities, and new literacies, more collaboration concerning literacy was needed; this realization became the genesis of a pilot study. The participants taking the pilot survey were the first twelve graduate students who volunteered. It should be noted most of the students were millennials who adapt well to collaborative learning, prefer online learning, and adjust quickly to mobile learning (Tabor 2016). Figure 25.1 illustrates the concerns of the graduate students; the largest problem identified by the participants was lack of time. It appeared creating a literacy pedagogic collaborative cloud would solve the problem by enabling literacy professionals a mobile learning platform to communicate ultimately to benefit their students, the profession, and themselves. The pilot study indicated further investigation was warranted.

The purpose of this online triangulated qualitative study was to verify a perceived need for the development of a mobile literacy pedagogic collaborative cloud. The research questions were: (1) Does the interest or need exist to create a literacy collaborative cloud for graduate students and alumnae? (2) What was the best format to encourage participation? The participants included 45 master's/doctoral students and recent alumnae from the literacy program at a Midwest University. The qualitative study utilized an ethnographic methodology to study a subculture who not only

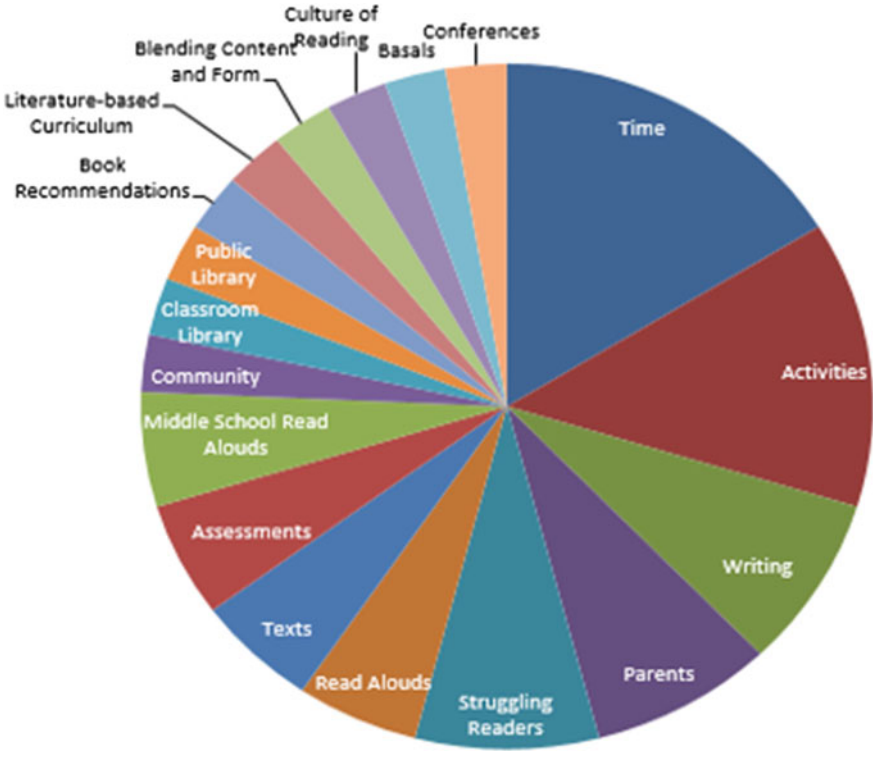

Fig. 25.1 Time crunch: concerns of graduate students ($n = 12$)

shared some of the same features (Muecke 1994), but also emphasized common experiences and behaviors (Morse and Richards 2002). The ethnographic approach was particularly appropriate because it was based on the immersion of the researcher in a distinctive social context, specifically online higher education (Hammersley and Atkinson 1983; Spradley 1980). The study included four sources of data: a questionnaire, semi-structured interviews, artifacts, and a researcher journal. Quality checks utilized in the study included using information gleaned from the questionnaire to refocus the interview questions and incorporate respondent feedback.

Eighty percent (80%) of the questionnaire participants agreed or strongly agreed with the creation of a literacy collaborative cloud. Focusing on the concept of literacy, 100% of the participants preferred to collaborate about literacy; many of them shared they did not have colleagues in their school or district to discuss current literacy issues. Indeed, fifty-seven percent (50%) *always* had unanswered questions concerning literacy. Concerning the concept of collaboration, 100% of the participants agreed collaboration improved teaching practice. One hundred percent of the participants preferred to collaborate with a group of professionals in their field. With respect to the concept of learning online, ninety-eight percent of the respondents concurred learning online improved teaching practice. Ninety-one percent of the participants agreed that online learning by teachers was enriching and worth the time.

When choosing content for a literacy pedagogic collaborative cloud, 89% of the respondents would like to focus on different content areas as well as literacy. What do the respondents view as the purpose of the LPCC (literacy pedagogic collaborative cloud)? Ninety-five percent (95%) of the participants would like to find out what others are doing; 93% would enjoy sharing ideas; 88% would appreciate the ability to learn new strategies; 65% would pose additional questions.

The findings of the LPCC study demonstrated the value of engagement in learning tasks consistent with the work of Razmerita and Kirchner (2014) who discussed the importance of groups sharing concerns and interacting together. In addition, the study supported Dewey's (1938) assertion that the teachers must take an active role in knowledge construction. The findings reflect the constructivist theories of Dewey (1938), Piaget (1970), and Vygotsky (1978) whose theories suggested learning involves "constructing, creating, inventing and developing our own knowledge" (Marlowe and Page 1998, p. 10) and highlight the concept that new knowledge was actively acquired (Brooks and Brooks 1999). Constructivism suggested new information, in the case of this study information concerning the need of a literacy pedagogic collaborative cloud, was actively assimilated into previous knowledge structures while simultaneously changing the structures. Finally, the quality of the collected artifacts and of the interviews supported Vygotsky's (1978) thoughts concerning the strong relationship between social interaction and high-level learning.

25.2.4 Professional Shift

The main intention of this study was to understand the needs of the graduate students and recent graduates of reading programs, fill the perceived gap if warranted, and improve practice (Shagoury and Power 2012). According to the participants, the creation of the literacy pedagogic collaborative cloud would fill the need for online informal collaborative professional development. Clarke and Hollingsworth (2002) examined the shift in professional development which encouraged educators to become active learners shaping their own professional growth through reflective participation and taking responsibility for their own learning. The aim of the LPCC study was to determine if a group of driven graduate students and recent graduates would be interested in creating a collaborative vehicle to build a community of professional educators so they in turn could facilitate their own learning concomitantly determining their path for change; the answer was a resounding yes! A literacy pedagogic collaborative cloud was created on the students' choice, Facebook. Figure 25.2 displays some of the participants' comments during the study.

An invitation to join a private Facebook group was extended to students and recent graduates; the mobile Facebook app was recommended. Communication has never stopped; group members sustain conversations over long periods of time on Facebook. The site is busiest in the evenings and over the weekends.

25.3 Conclusions

This study began by systematically examining the responses to a discussion question of an online reading class which ultimately became the genesis of this research study. Noticing the graduate students, soon to be graduating students, still had many questions concerning literacy combined with the knowledge of the rapidly changing field of literacy, this study sought to discover if an interest or need existed to develop a mobile literacy pedagogic collaborative cloud. Lessons learned included learning is not a straight path and flexibility is critical. Additionally, insight was gained from the qualitative work of Margaret Mead who posited the world changes through the work of small groups of dedicated people (as cited in Wheatley and Frieze 2011, p. 9). In the end, after confirmation from the study results, a literacy pedagogic collaborative cloud was created and is going strong. The LPCC reconfirms the findings of the OECD (Vincent-Lancrin et al. 2019) who found at a time when formal training for educators has grown only moderately in the past decade, informal professional development is seen as an "encouraging trend" (p. 3). The teacher is indeed the learner (Dewey 1916).

Student Y^1 I would like to help my students; most of my students live in poverty.

Student Y^3 responded: "…mobile technology fits my lifestyle."

Student Y^2 stated: "If I had access to a mobile collaborative platform, I would be living the dream! Three nights a week I have to wait for my kids at sports practice, with a mobile collaborative group I could be chatting.

Student Y^1 I use my phone all the time, by using a PCC I could be getting something done.

Student Y^2 stated: "I have a friend who I know would like to participate in a collaborative cloud; he is a business student."

Fig. 25.2 Comments of the participants

25.3.1 Recommendation and Final Thoughts

Encourage the development of informal peer learning professional development using social media focusing on three areas: mobility, sustainability, and badges. As Hargreaves and Shirley (2009) noted, "when teachers have structured opportunities to explore the nitty-gritty challenges of their practice through thoughtful exchanges with colleagues…. they rediscover the passion for learning and their own personal and professional growth that brought them into teaching in the first place" (p. 93). It seems educators collaborating with colleagues in an online literacy pedagogic collaborative cloud driven by mobile social media may ignite not only learning, but also personal and professional growth. Educators hold the key to unlock the future of learning; but there is still much to accomplish.

Glossary of Terms

Collaboration A group of two or more people learning together.

Collaborative learning cloud Cloud-based learning supported by collaborative tools including the Google platform, Padlet, social networks, and forums.

Community cloud A cloud location designed specifically with a group possessing one or multiple shared concerns which is managed and operated either internally by the group or externally by a third party.

E-learning collaborators Collaborators in the e-learning environment possessing the dual emphasis of providing and consuming.

Informal professional development Informal activities established to engage interaction, learning, and growth among educational professionals focused on practice.

Literacy Today, the definition of literacy incorporates and transcends functional literacy; literacies include the interactive, complex application of the skills, knowledge, and abilities needed to meet the social, cultural, political, technological, and economic challenges of the nonlinear twenty-first-century world.

Online collaborative learning Online collaborative discourse designed to promote knowledge building to incite learning and action.

Online community A formal or informal group situated in the online environment focused on a common purpose.

Peer professional development A group of peers linked by a similar professional practice sharing, creating, and reflecting; learning together.

Private cloud communities A cloud community is designed to provide support for a specific group of individuals.

Problem-based service learning A collaborative approach to instruction based on finding solutions to authentic problems and incorporating a service-learning component.

Smart "Smart" reflects logical, individualized, and flexible education, learning, environments, or pedagogy.

Smarter A "smarter" education or pedagogy emphasizes changing instruction for the better linked to incorporating twenty-first-century skills.

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