Mastering the Blend: A Professional Development Program for K-12 Teachers

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Blended learning is an instructional approach meant to enhance students' learning experiences by merging and deliberately integrating online technology into a face-to-face learning environment. With the increase in online instruction and blended learning comes the need for quality professional development programs that foster learning and encourage real change in the classroom. This paper introduces the design for a four-course professional development series on teaching in a blended learning environment that targets in-service teachers of K-12 students. Mastering the Blend is designed as a professional development opportunity to enhance teachers' face-to-face classroom instruction. The focus of the program as a whole is to assist K-12 teachers in developing the skills needed to design, develop, and facilitate student-centered blended learning environments. Through hands-on experience and activities designed to uncover best practices, participants are expected to develop the ability to effectively integrate a variety of tools into a blended learning experience. To model the methods being advocated, this professional development program is social constructivist in design and includes a blend of synchronous and asynchronous activities. The results of an initial evaluation of the program are described.

MASTERING THE BLEND: A PROFESSIONAL DEVELOPMENT
PROGRAM FOR K-12 TEACHERS

Blended learning, also known as hybrid learning, is an instructional approach that merges online technology and face-to-face strategies (Bernard, Borokhovski, Schmid, Tamim, & Abrami, 2014; Moskal, Dziuban, & Hartman, 2013). According to a national survey, 47% of high school students reported taking online courses to meet needs not offered at their school and 43% reported taking online courses so they can work at their own pace (Gemin, Pape, Vashaw, & Watson, 2015). Similarly, there is an increase in K-12 schools providing blended learning components in curricula (Clark & Barbour, 2015).

Blended learning provides schools with variety when considering individual student needs and diverse instructional options to prepare students for higher education and the 21st century workplace. Professional development that provides active learning opportunities is reported by teachers to increase skills, knowledge, and prompt change in the classroom practice (Birman, Desimone, Porter, & Garet, 2000). The same benefits were reported for those programs that provided coherence, or learning activities that built upon prior knowledge and experience, and discussions that involved real-life experiences between teachers and administrators (Birman et al., 2000; Signer, 2008). There is potential for blended learning to be highly effective if designed around collaborative learning activities.

Furthermore, the potential for blended learning to improve learning outcomes is not being fully realized, as the approach has not been widely adopted in effective ways (Torrisi-Steele & Drew, 2013). Graham and Robison (2007) suggested that teacher use of effective practices will ultimately determine the institutional adoption of blended learning. This recommendation implies a need to educate teachers in effective blended teaching strategies. Research must continue to evolve (Keengwe & Kang, 2012) and teacher education programs must continue to adjust to equip teachers with the tools and skills required in the 21st century classroom environments (Kennedy & Archambault, 2012b).

LITERATURE REVIEW

Blended Learning

Blended learning is an instructional approach that merges technology and face-to-face strategies. The term blended learning is often used synonymously with hybrid learning (Bernard et al., 2014; Moskal et al., 2013). Various definitions of blended learning exist. The most basic definitions

refer to a level of online technology integration in learning. According to Bohle Carbonell, Dailey-Hebert, and Gijselaers (2013), "In the simplest form blended learning is a mixture of physical classroom activities and learning activities supported through online technologies" (p. 29). Vaughan and Garrison (2005) contributed "…blended learning designs reach beyond the benefits of convenience, access and efficiency. The true benefit of blended learning is in integrating face-to-face verbal and online text-based exchanges and matching each to appropriate learning tasks" (p. 4). For the courses proposed in this document, blended learning is defined as the deliberate integration of online technology into a face-to-face learning environment to the end of enhancing the learning experience.

Blended learning can help teachers break from teacher-centered, passive classrooms and transition to more student-centered, active classrooms (Christensen, Horn, & Staker, 2013; Gemin et al., 2015). Often, a blended learning approach provides a road map for students to work at their own pace. The technology used can take some burden off of teachers' time and automate some of the manual tasks that teachers perform. Technology does not replace the teacher or instruction; technology is used to enhance the process of learning (Christensen et al., 2013). In summary, the blended learning approach capitalizes on the integration of face-to-face verbal and online text-based exchanges and connecting those exchanges to learning tasks, focusing on student individualization (Christensen et al, 2013; Vaughan & Garrison, 2005).

Blended learning was shown to enhance learning outcomes when compared with a traditional classroom (Bernard et al., 2014) and with an online classroom (Chen, 2012), specifically through collaboration and community building (Agosto, Copeland, & Zach, 2013; Bernard et al., 2014). Recommendations for the design of quality blended learning included starting with a flexible design process that can cater to the individual needs of the learners, aligning course objectives to course components, fostering continuous student to student and learner to instructor interactions, and carefully selecting classroom technologies (which are often overlooked) as well as online technologies (McGee & Reis, 2012). Owston (2013) recommended that the goals of implementing blended learning align with the students' goals in addition to the goals of the teachers and administrators.

There are various tools that have been developed in recent years that assist schools and educators implementing methods to reach these goals, as well as in evaluating such courses. The iNACOL National Standards for Quality Online Courses were based on best practices with a goal to "provide a working framework of the characteristics of emerging blended learning and a multi-stage process of defining high-quality blended learning in the future" (iNACOL, 2011, p. 8). The rubric can be used to assist the

evaluation of online elements of blended learning courses. The iNACOL Blended Learning Teacher Framework is an evolving framework to assist in the development of training and supporting educators in blended classrooms (Powell, Rabbitt, & Kennedy, 2014). The framework was designed as a guide, and is "intended to apply across different environment and instructional contexts" (Powell et al., 2014, p. 7). The framework recognized 12 competencies, divided into four domains (mindset, qualities, adaptive skills, and technical skills). The framework used competencies, not standards, and can guide the growth and learning of a blended learning educator. Both the iNACOL rubric and framework can be used to guide and evaluate if blended teacher competencies are being applied and if objectives align across blended courses.

Professional Development

With the increase in online instruction and blended learning came the need for quality professional development programs that foster learning and encourage real change in the classroom, including the focus on developing best practices (Rice, 2009). Just over four percent of teachers in the United States were trained for teaching in an online environment (Archambault et al., 2016). The professional development needs of K-12 online teachers was not being provided or prioritized by universities and state agencies, therefore teachers were left to find their own professional development opportunities (Rice & Dawley, 2007). As Kennedy and Archambault (2012b) noted, "Teacher education programs need to recognize this need and begin preparing candidates for 21st century teaching and learning environments, providing them the necessary skills and dispositions for the ever-evolving field of education" (p. 198).

Professional development that provides active learning opportunities were reported by teachers to increase skills, knowledge, and prompt change in the classroom practice (Birman et al., 2000). The same benefits were reported for those programs that provide coherence, or learning and activities that build upon prior knowledge and experience, and discussions that involve real-life experiences between teachers and administrators (Birman et al., 2000; Signer, 2008). Rice and Dawley (2007) found that some teacher participants in their study indicated an overall feeling of inadequacy in professional development, such that the education they received was "mostly reactive rather than proactive" (p. 33).

Professional development courses in blended learning offered by institutions tended to be characteristic of mature blended learning implementations (Graham, Woodfield, & Harrison, 2013), and were considered critical to successful blended learning endeavors (Moskal et al., 2013). In a review of the literature on current blended learning programs for pre-service

teachers, which may parallel professional development for in-service teachers, Keengwe and Kang (2012) stated that the main components of current programs included developing learning communities through online discussion tools and online communities, teacher-created instructional materials using technology, and integration of teacher's skills into instruction.

Unfortunately, in pre-service teacher blended learning programs, the student was often given a passive role in the learning environment (Keengwe & Kang, 2012). The program described in this paper uses a blended learning approach, as suggested for professional development courses on technology integration (Duhaney, 2012). However, unlike many courses, students in the constructivist courses will be active creators of instructional content. A social constructivist theoretic background is appropriate for guiding the design and development of this professional development program. The instructional principles derived from social constructivism included anchoring learning to a larger task, designing an authentic project that reflects the complexity of the environment, providing a supportive yet challenging learning environment, and providing opportunities for reflection (Herrington, Reeves, & Oliver, 2014; Savery & Duffy, 1996). The authors analyzed one social constructivist professional development course for usability concerns, including various challenge and hindrance stressors that participants of the course experienced, as well as interaction among peers and the instructor (Phillips, Sheffield, Moore, & Robinson, 2015; Robinson, Sheffield, Phillips, & Moore, 2017). Hindrance stressors such as students working collaboratively among several time zones, detracted from a learning experience and should be limited. It was recommended to pace the frequency of challenge stressors by reducing the number of tools participants were exposed to and provide ample scaffolding with specific examples (Phillips et al., 2016).

Belland, Burdo, and Gu (2015) recommended professional development programs offer flexible learning, such as using a blended learning approach. Further, professional development should provide examples of instructional strategies, including implementation, to connect what is learned in the professional development course to the existing classroom (Belland et al., 2015). To implement such strategies, teachers must have an awareness of how the online environment may impact their pedagogy (Archambault & Crippen, 2009). Technology, Pedagogy, and Content Knowledge (TPACK) is a framework to measure such self-efficacy and confidence levels (Koehler & Mishra, 2005). The use of the TPACK survey at the beginning and end of a course (pre- and post-TPACK) can measure the self-reported confidence levels of the participant in the areas of pedagogical knowledge, technological knowledge, technological content knowledge, pedagogical content knowledge, technological pedagogical knowledge, and technological

pedagogical content knowledge. Self-efficacy, or the process by which individuals evaluate their capabilities, strengths, weaknesses, and generate self-appraisals of capability (Ropp, 1999), could be measured at the beginning and end of a professional development program. The TPACK survey as a pre-assessment or baseline may help the instructor understand the experience and skill levels of participants and where support may be needed.

Community

Participating in a community of practice was deemed fundamental to learning (Wenger, 2000). In a community of practice, those participating defined the competence and expectations of the community, which is also defined socially and over time. An apprenticeship of any sort occurred when the apprentice entered the community of practice with personal experiences, but also learned the already-established expertise of the community. Learning is at the heart of a community of practice (Wenger, 2000). There are benefits of participating in learning communities and such communities, groups, and networks were formed because of a shared endeavor or interest (Dufour & Eaker, 1998; Wenger, McDermott, & Snyder, 2002). The development of a community takes time and organization, and further, "[a] community of inquiry provides a sense of connection and support in the systematic and purposeful pursuit of a shared educational goal" (Garrison, 2006, p. 26).

The Community of Inquiry (CoI) model is a framework with three central components: social presence, cognitive presence, and teaching presence. The intersecting of each presence: connecting with the members of a community in meaningful way, collaborative inquiry, and the structure provided to allow this to happen was the way to create a community of inquiry (Garrison, 2006). The CoI survey measures each of the presences (social, cognitive, and teaching) (Arbaugh et al., 2008) and pre- and post-CoI scores may indicate changes in social presence, cognitive presence, and teaching presence from the beginning of a course to the end. As Arbaugh et al. (2008) explained, the CoI measurements should be used for course and program assessment in addition to research.

Course designers and instructors must consider the time and efforts required to build relationships among learners (Phillips et al., 2016). The level of interaction was important to the students in one social constructivist course, but the way the students preferred to interact (synchronous versus asynchronous) varied (Robinson et al., 2017). Students may not be prepared for high-level interactions that instructors use to help foster relationships (the first steps to community building) including synchronous online meetings and synchronous collaborative group work (Robinson et al., 2017).

Further, students may need extra support from the instructor in learning to be social in the online environment, particularly when synchronous collaborative learning and group activities are used. Providing a higher level of care and support is encouraged and should be considered when designing and developing highly-collaborative learning environments (Robinson, 2016).

Instructional Design Model

The Rich Environments for Active Learning (REAL) model can be used to guide course design and aligns with the social constructivist philosophy and emphasizes authentic, generative learning activities and student responsibility in a collaborative environment (Grabinger & Dunlap, 1995; Robinson, Phillips, Moore, & Sheffield, 2014). The five attributes of the REAL model are student responsibility and initiative, generative learning activities, authentic learning contexts, authentic assessment strategies, and collaborative learning (Grabinger & Dunlap, 1995; Grabinger, Dunlap, & Duffield, 1997; Robinson et al., 2014). The REAL model also offers the advantage of being flexible because the ideology is consistent with a range of instructional strategies including "reciprocal teaching, cognitive apprenticeship, anchored instruction, cognitive flexibility theory, learning in design, and problem-based learning (PBL)" (Grabinger & Dunlap, 1995, p. 15).

The REAL model emphasizes the importance of collaboration and social negotiation of meaning. The activities used in this type of learning environment should reflect these attributes. Knowledge construction is supported by peer and instructor interactions, rather than just delivered to students. Students work on projects that are authentic or real world, combined with peer feedback and reflection. This is expected to enhance student responsibility and initiative (Grabinger & Dunlap, 1995; Grabinger, Dunlap, & Duffield, 1997).

METHODS

This paper introduces the design for a four-course professional development series on teaching in a blended learning environment. It is based on a 16-week course for pre-service teachers (Introduction to Teaching Online) that was developed by the authors (Moore, Sheffield, Robinson, & Phillips, 2014). This article is intended to be a guide for designers and those who are developing blended learning professional development programs. The program is grounded in research and the recommendations used are from the full evaluation of the original Introduction to Teaching Online course. These recommendations included fostering relationships among learners to prepare learners for high-level interactions (Phillips et al., 2016), supporting and encouraging students' efforts to be social during synchronous

meetings and collaborative activities (Robinson, 2016; Robinson et al., 2017), and pacing learners' exposure to challenge stresses to avoid overwhelming learners (Phillips et al., 2016). The authors hope the detail provided in the description of the individual course goals, objectives, and activities as well as the recommendations for further refinement serve as a foundation for those who wish to integrate the program or create a similar program.

This professional development program targets in-service teachers of K-12 students. It is designed as a professional development opportunity to enhance teachers' face-to-face classroom instructions. The focus of the professional development program as a whole is to assist K-12 teachers in developing the skills needed to design, develop, and facilitate student-centered blended learning environments. The program explores a variety of blended learning models as opposed to teaching a single model such as flipped or station rotation (Horn & Staker, 2013). The main focus of the program is on pedagogy and other issues, including accessibility and universal design.

To model the methods being advocated, this professional development program is social constructivist in design and includes a blend of synchronous (face-to-face or web conference) and asynchronous activities. This program is designed to encourage participants to be active rather than passive learners. In addition, the program is intended to change participants' perceptions and attitudes towards blended learning through their experiences in the series of courses. This professional development program is expected to help fill a need for educating teachers in effective blended teaching and learning strategies.

Target Audience

The target audience for this program is K-12 in-service teachers who are interested in learning more about the best practices of blended learning and who want to integrate blended learning into their curriculum. These classroom teachers may have an understanding of what blended learning is, but may not have the training or knowledge concerning the tools available in the learning management system (LMS) and how to use the tools to enrich the classroom or for the online component of a blended learning lesson. Adjustments may be needed for the unique needs of specific audience groups.

The Professional Development Program

The Mastering the Blend professional development program is devoted to the study of blended learning, student-centered instruction, and effective practices. Through hands-on experience and activities designed to uncover best practices, participants are expected to develop the ability to effectively integrate a variety of tools into a blended learning experience. Course goals

and objectives were derived from and align with online teaching standards and blended learning teacher competencies published by iNACOL (2011), ISTE (2008), and NEA (2006) as well as research in the field (Kennedy & Archambault, 2012a; Moore et al., 2014).

The professional development program, referred to as Mastering the Blend, consists of four courses:

1. Blended Learning: The Toolset

2. Blended Learning: The Apprenticeship

3. Topics in Blended Learning

4. Becoming a Blend Master

This program was designed and developed in Moodle, but could be adapted to be delivered using any LMS. Participants engage in community building activities throughout the program. Social media tools such as Twitter, personal blogs, web conferencing, and instant messaging were integrated to share personal experiences and group findings. Synchronous meetings were designed to be held face-to-face or using web conferencing software such as Adobe Connect. The tools explored in this course are those currently available within the Moodle LMS (i.e., book, page, wiki, glossary, lesson, or database).

Course 1. Blended learning: Developing the toolset

The first course in the professional development program, Blended Learning: Developing the Toolset, is a four-week course that immerses teachers in exploring the tools that can be used when designing and developing a blended learning course. The outward goal of the course is for the participants to learn to develop online activities using Moodle. Along the way, participants should develop self-sufficiency as they learn to search for and utilize web-based resources to find documentation and support needed to develop their Moodle activities. In addition, as participants in a student-centered blended course, they are exposed to the ideas and methods of student-centered instruction. The course was also designed to begin developing interdependency as each participant is assigned the task of becoming an expert in a single Moodle tool. Ideally, this interdependency will become part of the foundation of a professional learning community.

Using a social constructivist approach, participants research the tools, develop a glossary of tool descriptions, and create an activity or lesson using one of the tools. Community building begins in this first course in the program; as discussed in the literature review, collaboration and community building are essential in blended learning (Grabinger & Dunlap, 1995). The design of this course promotes active learning through asynchronous discussion forums, a tools project, and weekly synchronous meetings. Additionally, a social media aspect is an optional but encouraged thread throughout the program (Table 1).

Table 1

Developing the Toolset: Summary of Implementation

Week	Major learning activities
Week 1	*Getting Started.* Participants join community building activities and receive an introduction to the program and the course. Participants choose a Moodle tool to research.
Week 2	*Tool Research.* Participants research the tool they chose in week 1. Participants research and discuss blended learning best practices.
Week 3	*Project Development.* Participants develop an activity using their selected tool for a blended environment.
Week 4	*Project Evaluation.* Participants use a rubric to evaluate peer tool projects. Participants select a topic and team for course 2.

Course goals. The goal of the course is to prepare K-12 in-service teachers to integrate the Moodle LMS tools into a blended learning lesson. Participants will understand the function of and use for the Moodle LMS tools. Participants will have the confidence to utilize and integrate the Moodle tools into a blended learning classroom.

Course objectives. Participants will:

1. be able to navigate the current and emerging tools for online learning presented in a Moodle course,

2. be comfortable and confident utilizing the features of Adobe Connect,

3. develop an understanding of the tools available for a blended learning lesson or course, and

4. demonstrate their ability to use a rubric to evaluate projects.

Course 2. Blended learning: The apprenticeship

The course, Blended Learning: The Apprenticeship, is intended to help teachers learn how to design and develop effective student-centered blended learning experiences. It provides participants with an opportunity to build on the skills developed in the first course. Using an approximation of an apprenticeship model, participants work hand-in-hand with the course facilitator to design and develop four units of instruction on blended learning topics using blended learning strategies. Specifically, participants are divided into teams with each team focusing on one of the following topics as it relates to blended learning: (a) content, (b) communication, (c) collaboration, and (d) assessment. Course experiences also include discussion and implementation of standards and best practices for online learning, including accessibility and universal design.

During the process of creating activities for this unit, participants explore a variety of issues and ideas related to the design and delivery of blended

learning. Each team will develop instructional design documents which propose a set of activities, along with the Moodle activities to be used to develop them. Teams will work independently in their own workspace, or course shell, through the week before posting their design document to a forum for review by their peers. The design documents will be further discussed in the weekly class meeting where the goal will be to ensure alignment and continuity between the units of the Topics in Blended Learning course.

All of these activities are designed for discussion in context for a more authentic learning experience as recommended in the REAL model (Grabinger & Dunlap, 1995). The goal is for this information to be used later to guide and inform participants' efforts with their own students. Participants are also encouraged to continue to make the shift toward student-centered teaching. After the conclusion of this course, participants will deliver the units they developed to a collection of their colleagues.

The Topics in Blended Learning course development project at the heart of this course is managed and directed by the facilitator of the Apprenticeship course, but the majority of the effort is driven by the blended learning "apprentices" or participants in the Apprenticeship course. While each team will be given some latitude when it comes to the design of the unit, the experience is well scaffolded (Vygotsky, 1978) with suggested topics, templates, and instructor feedback. It is important that the resulting course feels cohesive, organized, and complete. Asking the participants to work together not only within their team but also with the entire class provides each participant with multiple layers of support and means for interaction, hopefully increasing the sense of community (Garrison, Anderson, & Archer, 2001) within the five-week course and over the long-term. Table 2 provides a summary of the major learning activities for this course.

Table 2

The Apprentice: Summary of Implementation

Week	Major learning activities
Week 1	*Getting Started.* Allow participants to reconnect, outline the course project, define team roles, and begin topic research into Topics in Blended Learning.
Week 2	*Project Design.* Participants review and discuss design documents for Topics in Blended Learning units. The design documents are further discussed in the weekly synchronous class meeting, where the goal is to ensure alignment and continuity between the units of the Topics in Blended Learning course.
Week 3	*Project Development.* Participants develop Topics in Blended Learning units and a collective course style guide.
Week 4	*Project Review.* Participants conduct a detailed review of Topics in Blended Learning course using multiple methods. Participants then review standards for online and blended courses and develop a blended learning course rubric.
Week 5	*Revision and Wrap-up.* Participants complete revisions and final review using the blended learning rubric, prepare Topics in Blended Learning course for delivery, and complete teammate evaluation. Instructors evaluate units using the iNACOL National Standards for Quality Online Courses rubric (iNACOL, 2011).

Course goals. The goal of this course is to prepare in-service teachers with the knowledge and skills needed to effectively design and develop on-line activities for use in a student-centered blended learning environment.

Course objectives. Participants will:

1. apply emerging best practices in the design of blended learning experiences,

2. apply principles of student-centered learning,

3. apply instructional design principles for online course design,

4. explore topics related to the design and facilitation of blended learning experiences, and

5. use a learning management system and related technologies to design a blended learning unit.

Course 3. Topics in blended learning

The third course, Topics in Blended Learning, is somewhat different from the previous two. The teachers take on the role of facilitator (partici-pant-facilitator) to deliver and facilitate a blended learning experience. The four units developed by the participants in the second course are combined into a single course and taught by the participant-facilitators to a new group of learners – a group of fellow K-12 educators (peer learners). The peer learners in the Topics in Blended Learning course consist of other teachers who are interested in beginning to learn more about blended learning, but who may not be able or willing to commit the time required for the Master-ing the Blend program. For a school district using the Mastering the Blend program for professional development, this combination of courses provides a way to bring teachers on board in phases and to gradually develop a learn-ing community.

Facilitating their unit allows participant-facilitators an opportunity to practice their blended learning skills in an authentic environment. The aims of this course are twofold. First, participant-facilitators improve their blended learning implementation skills. Second, peer learners enrolled in the course gain exposure to various blended learning strategies, topics, and issues. For peer learners, this course also serves as a sample of what the blended learning program offers. As peer learners enrolled in the course, they may gain a better understanding of the expectations and outcomes of the program as a whole. This experience may result in peer learners enroll-ing in later offerings of the full program.

During the delivery of the Topics in Blended Learning course, partici-pant-facilitators in the Mastering the Blend program take part in a variety of secondary activities and discussions with the program instructors related to facilitating and monitoring blended learning experiences. For an outline of course activities, see Table 3.

Table 3

Topics in Blended Learning: Summary of Implementation

Week	Major learning activities
Week 1	*Getting Started.* Participant-facilitators prepare to implement and facilitate the units they developed in course 2. Peer learners are introduced to the format and participation expectations of the course.
Week 2	*Content.* The participant-facilitators assigned the topic of content in the apprenticeship course facilitate in week 2. Peer learners complete the learning activities on the topic of content as developed by program participants in the apprenticeship course.
Week 3	*Communication.* The participant-facilitators assigned the topic of communication facilitate in week 3. Peer learners complete activities on the topic of communication in blended learning environments.
Week 4	*Collaboration.* The participant-facilitators assigned the topic of collaboration facilitate in week 4. Peer learners complete activities on the topic of collaboration in blended learning environments.
Week 5	*Assessment.* The participant-facilitators assigned the topic of assessment facilitate in week 5. Peer learners complete related activities.

Course goals. The goal of the course is to provide an initial authentic opportunity for in-service teachers to facilitate a blended learning experience in a friendly environment among a group of educators (peer learners) who know the participant-facilitators are "in training".

Course objectives. Participant-facilitators will:

1. facilitate a unit of instruction on a blended learning topic with an audience of peer learners from outside the program,

2. create opportunities for peer learners to engage in topic-related interactions,

3. assess peer learners' growth as a result of the learning activities in the units, and

4. evaluate their unit of instruction for pedagogical soundness, technical usability, and effectiveness.

Objectives for the peer learners will be determined by the participant facilitators within the bounds of the facilitators' assigned topics.

Course 4. Becoming a blend master

During the fourth and final course, Becoming a Blend Master, teachers apply what they have learned in the program to their own K-12 classrooms. This course reinforces, refines, and extends participants' skills and strategies for blended learning as participants develop and share student-centered blended learning experiences for their own K-12 classrooms. This real-life

application is expected to help teachers transfer their growing understanding of blended learning into their daily work lives. As with the other courses in the program, the participants receive feedback and support from their peers and the course facilitators. This final blended course provides the participants another opportunity to explore the best practices in blended learning, but this time the lessons are cemented in the authentic context of their own classrooms.

The topic of the course is blended learning in the K-12 environment. Students develop another unit of instruction. The cyclical design approach throughout the program is expected to strengthen participants' knowledge gained throughout the program and increase the likelihood of long-term behavioral changes. The specific topic of each unit development task is flexible. Participants select a topic that can be implemented in their own K-12 classrooms (Table 4).

Table 4
Becoming a Blend Master: Summary of Implementation

Week	Major learning activities
Week 1	*Getting Started.* Participants write forum posts on new happenings in their lives since their last course in the program and watch a video reviewing work and content from previous courses in the program. During the synchronous meeting, participants are introduced to the major models of blended learning and groups brainstorm ideas for major project.
Week 2	*Project Design.* Participants choose a blended learning model to guide the design of their unit of instruction and attend a synchronous meeting where they propose their unit design plans.
Week 3	*Project Development.* Participants develop their unit of instruction in Moodle.
Week 4	*Project Review.* Participants present their units to the class during a synchronous meeting and evaluate their peers' work using a rubric developed in course 2 in the program. Instructors evaluate units using the iNACOL National Standards for Quality Online Courses rubric (iNACOL, 2011).

Course goals. The goals of this course are to 1) explore the major blended learning models and 2) help in-service teachers transfer the knowledge and skills they accumulate in the program into their daily practice in the K-12 classroom.

Course objectives. Participants in the Blend Master course study blended learning models and effective practices. Participants will:

1. design a blended unit of instruction that provides their students with access to learning materials and educational resources,

2. select, create, and organize appropriate content (e.g., legal or unbiased) using appropriate delivery methods, assignments, projects, and assessments,

3. create assessment activities that evaluate student knowledge while monitoring academic integrity, and

4. personalize the learning experiences based on student assessment needs and performance.

Upon completion of the Mastering the Blend professional development program, participants are encouraged to continue their professional growth through the Blended Learning Masters professional learning community. The benefits of participating in learning communities are well established and these communities, groups, and networks are formed because of a shared endeavor or interest (Dufour & Eaker, 1998; Wenger, McDermott, & Snyder, 2002). A shared vision, supportive environment, and a collaborative educational community that fosters growth are what the designers of the course envisioned for the Blended Learning Masters learning community. The goal of the community environment in this program is to continue to make use of the tools with which the participating teachers have become familiar through the program, such as Moodle, Twitter, personal blogs, web conferencing, and instant messaging tools, as well as sharing the knowledge from participating in the course with their peers, administrators, and in their school districts.

Evaluation of Program

Evaluation of the program is divided into three phases. The first phase is a peer review prior to any implementation of the courses. This portion of the evaluation is finished and the changes to the courses based on this evaluation are complete, as described in the preliminary findings. The second phase is a pilot run of the program. The four courses will be offered in the near future as a pilot to provide a setting for evaluating the program. Participants for the pilot program will be chosen from a representative sample of K-12 teachers. The third phase of evaluation consists of the ongoing evaluation that will be conducted during the actual implementation of the program.

Evaluation components are placed throughout the program (Table 5). Formative evaluation components measure the fidelity of the program intervention to the intended outcomes. The iNACOL National Standards for Quality Online Courses rubric (iNACOL, 2011) was used in the peer review to evaluate the courses. Blended learning frameworks and rubrics are not yet well established (Keengwe & Kang, 2012). However, the committee that developed the iNACOL rubric feels it is beneficial for both online and blended course implementation. As it noted, "The topic of developing a separate set of standards for blended courses was discussed. The committee and iNACOL believe that all online content, however it may be implemented, should meet the standards in this document" (iNACOL, 2011, p. 6). The iNACOL Blended Learning Teacher Competency framework (Powell,

Rabbitt, & Kennedy, 2014) guides the analysis of attitudes and perceptions about blended learning. Summative evaluation components are designed to measure the impact of the intervention; as part of the evaluation, learners complete the 34-item CoI (Arbaugh et al., 2008) and TPACK (Archambault & Crippen, 2009) surveys during the course.

Table 5
Timeline of Evaluation Components

	Course 1 Toolset		Course 2 Apprenticeship		Course 3 Topics		Course 4 Blend Master		After Course Series
	Start	End	Start	End	Start	End	Start	End	
TPACK Survey	X	X		X				X	
iNACOL Course Eval				X				X	X
CoI Survey				X				X	
iNACOL Teacher Eval	X	X	X	X	X	X	X	X	X
Weekly Blog Reflections	X	X	X	X	X	X	X	X	
Weekly Course Reflections	X	X	X	X	X	X	X	X	
Participation Level	X	X	X	X	X	X	X	X	
Social Media Mentions	X	X	X	X	X	X	X	X	X

The course series development is complete and the series has undergone peer evaluation, which is the first stage of the formative evaluation. Two instructional designers each reviewed the course series. The iNACOL National Standards for Quality Online Courses rubric (iNACOL, 2011) was used in the peer review to evaluate the course. This course series is dominated with online learning elements, therefore, the iNACOL rubric is considered appropriate.

The second stage of formative evaluation will start once the course pilots begin. During the pilot stage, participants will be asked to respond to a weekly course reflection. This reflection provides a timely, open-ended medium for learners to offer a wide range of comments or criticism about the course. The weekly course reflection presents three questions:

1. The amount of time required to complete the first week's activities was (a) far too much, (b) too much, (c) just right, (d) too little, (e) far too little, or (f) don't know.

2. Reflecting on the course to this point, what is one thing you would have us keep the same?

3. What is one thing you would have us do differently?

Most weeks during the course series, the learners are asked to write a blog reflection on topics related to blended learning and the learners' growth. These blog reflections will be examined for learners' perceptions and attitudes. The iNACOL Blended Learning Teacher Competency framework (Powell, Rabbitt, & Kennedy, 2014) will guide the interpretation of attitudes and perceptions about blended learning.

Participation levels will be monitored each week using the logs and post tracking in the LMS as well as monitoring of course-related Twitter posts made by learners. Peaks and declines in learner activity in the LMS and tweets will be examined in the context of course assignments, timing of outside obligations (i.e., start or end of K-12 school year, holidays, or K-12 exams), and dialog in the course to determine likely causes and to consider changes to the course.

The summative evaluation will measure the impact of the course on the implementation of blended learning. Learners will complete the 34-item CoI (Arbaugh et al., 2008) and TPACK (Archambault & Crippen, 2009) surveys. The CoI instrument is intended to measure the level of learner presence, teacher presence, and cognitive presence.

The assessment of learner-developed instruction will be used as part of the summative assessment as well as the formative assessment. The initial review of learner-created instructional units evaluated using the iNACOL Standards for Quality Online Courses rubric (iNACOL, 2011) will be contrasted with a review of the last learner-created unit in the fourth course. Evaluators will look for changes in adherence to the iNACOL Standards as an indication of program effectiveness. After learners complete the course series, evaluators will examine learners' K-12 courses for evidence of blended learning implementation. The iNACOL Standards will be used to examine this subsequent K-12 instruction.

Changes in learners' perceptions and attitudes will be part of the summative assessment. As stated earlier, the iNACOL Blended Learning Teacher Competency framework will be used to measure changes in learners' perceptions and attitudes about blended learning.

PRELIMINARY FINDINGS

The first phase of the program evaluation, the peer review using the iN-ACOL Standards for Quality Online Teaching rubric, has been completed. The results are reported here as preliminary findings. Two instructional design experts reviewed the program using the rubric; a third reviewer read through the design document and examined the courses to provide general feedback. There was a significant level of correlation between the two reviewers' ratings. This inter-rater reliability was measured by the Pearson's correlation coefficient on 49 items in the rubric (r_p = .369, p < .01). There are a total of 53 items on the rubric, but four of the items were marked as "not applicable" by one or both of the reviewers. The score items were (a) 0: Absent--component is missing, (b) 1: Unsatisfactory--needs significant improvement, (c) 2: Somewhat satisfactory--needs targeted improvements, (d) 3: Satisfactory--discretionary improvements needed, and (e) 4: Very satisfactory--no improvement needed.

Of the five areas rated in the rubric, the instructional design category received the highest score. On this scale of 0-4, the average rating of items in that category for both reviewers was 3.5 (Table 6). The communication and interaction subcategory was rated particularly high (3.8). As the program was designed around social constructivist principles, the program designers emphasized the integration of interpersonal interactions among peers and with instructors. The collaborative projects, peer reviews, peer teaching, and instructor feedback are all elements of the program that highlight these interactions.

The content category received the second highest rating from the reviewers (3.3). Most subcategories in the content category were rated at a 3 or above, indicating they were found in need of only minor improvements. The instructor resources subcategory demands attention. This subcategory received an average score of 2.5, which indicates that major improvements are needed. The reviewers were somewhat polarized in their feedback of the instructor resources with one reviewer rating them as 3.5 and the other scoring this subcategory at a 1.5. Both reviewers left comments that more detailed documentation should be provided to support the assessment of student tasks.

The need for better descriptions of student assignments was not only noted in reference to instructor resources—it was also suggested within the student assessment category that more detail was needed for students regarding assignment instructions and grading criteria (subcategory assessment resources and materials). This subcategory also received a low rating (2.3). In contrast, evaluation strategies and feedback subcategories were found to need only minor or discretionary improvements.

Table 6
Program Evaluation Ratings

Category	Subcategory	Rating
Instructional Design		3.5
	Communication and Interaction	3.8
	Instructional and Audience Analysis	3.5
	Course, Unit, and Lesson Design	3.5
	Resources and Materials	3.5
	Instructional Strategies and Activities	3.3
Content		3.3
	Legal and Acceptable Use Policies	3.8
	Course Overview and Introduction	3.5
	Academic Content Standards and Assessment	3.4*
	Instructor Resources	2.5
Student Assessment		3.0
	Evaluation Strategies	3.5
	Feedback	3.3
	Assessment Resources and Materials	2.3
Technology		2.9
	Data Security	4.0*
	Course Architecture	3.5
	Technology Requirements and Interoperability	2.8
	Accessibility	2.0
	User Interface	2.0
Course Evaluation and Support		1.9
	Instructor and Student Support	2.3
	Assessing Course Effectiveness	1.8*
	Course Updates	1.5
	Certification	NA**

Note. Source: National Standards for Quality Online Courses (iNACOL, 2011).

Rating scale: 0=absent, 1=unsatisfactory, 2=somewhat satisfactory, 3=satisfactory, 4=very satisfactory

*one reviewer marked one item in this subcategory as "not applicable", therefore the score on that one item represents only the other reviewer's rating.

**Two reviewers marked an item in this subcategory as "not applicable".

The technology category scored low (2.9), however, the data security

subcategory stands out as particularly high (4.0). One reviewer deemed this subcategory not applicable because this subcategory asks whether the program complies with the Family Educational Rights and Privacy Act (FERPA). The ratings and reviewer comments in the lower rated subcategories (technology requirements and interoperability, accessibility, and user interface) indicated a need for more multimedia in the form of videos, audio, imagines, and visual guides such as icons. There was also a deficiency in technical support for learners.

The category with the lowest scores was course evaluation and support (1.9). The subcategory course updates contributed to the low score. The reviewers noted that there was no schedule in place for mandatory program updates. The iNACOL standards recommend programs be reviewed and updated at least every three years. While the program documentation described an evaluation strategy, there was no timeline for ongoing revisions. This sentiment is repeated in the assessing course effectiveness subcategory which, once again, states that courses should receive ongoing evaluation. As noted above, a procedure was in place for ongoing program evaluations, but there was no stated frequency and timing for those revisions.

In addition to the feedback arising from the iNACOL Standards for Quality Online Teaching, the third reviewer suggested that the course designers create a logic model to accompany the course description detailing the inputs, outputs, and outcomes of the program as well as key assumptions and external factors impacting the blended learning professional development program. This reviewer also voiced concern over how the blogs and other teacher sentiments would be analyzed using the iNACOL Blended Learning Teacher Competencies framework. The framework provides a description of teacher competencies rather than a rubric or a scale, and using the framework to rate teacher progress may involve a degree of subjectivity. The reviewer recommended a coding scheme for analyzing teacher sentiments as related to the framework.

DISCUSSION AND CONCLUSION

Mastering the Blend is based on a 16-week course for pre-service teachers (Introduction to Teaching Online). The designers of this program for in-service teachers considered findings from the studies of the original 16-week course. The earlier findings indicated participants recognized the importance of group interactivity in spite of challenges they encountered (Sheffield, Moore, Phillips, & Robinson, 2015) and the need for participants to build relationships with peers before collaborating within groups (Phillips et al., 2015). Participants indicated that more examples of completed work and guidance from instructors were needed; they valued instructor feedback (Sheffield et al., 2015).

An overview of the program organization and participant enrollment and experience sharing cycle is depicted in Figure 1. Learners enter the program through two paths. In one path, participants join the entire four-course program starting at course 1 and progress in sequence through course 4. In the second path, learners enter course 3 and take on the role of peer-learners. After completing course 3, those learners may join the entire four-course program starting at course 1 or they may choose to end their participation in the program. Participants of both paths are encouraged to share their ongoing experiences in a professional learning community.
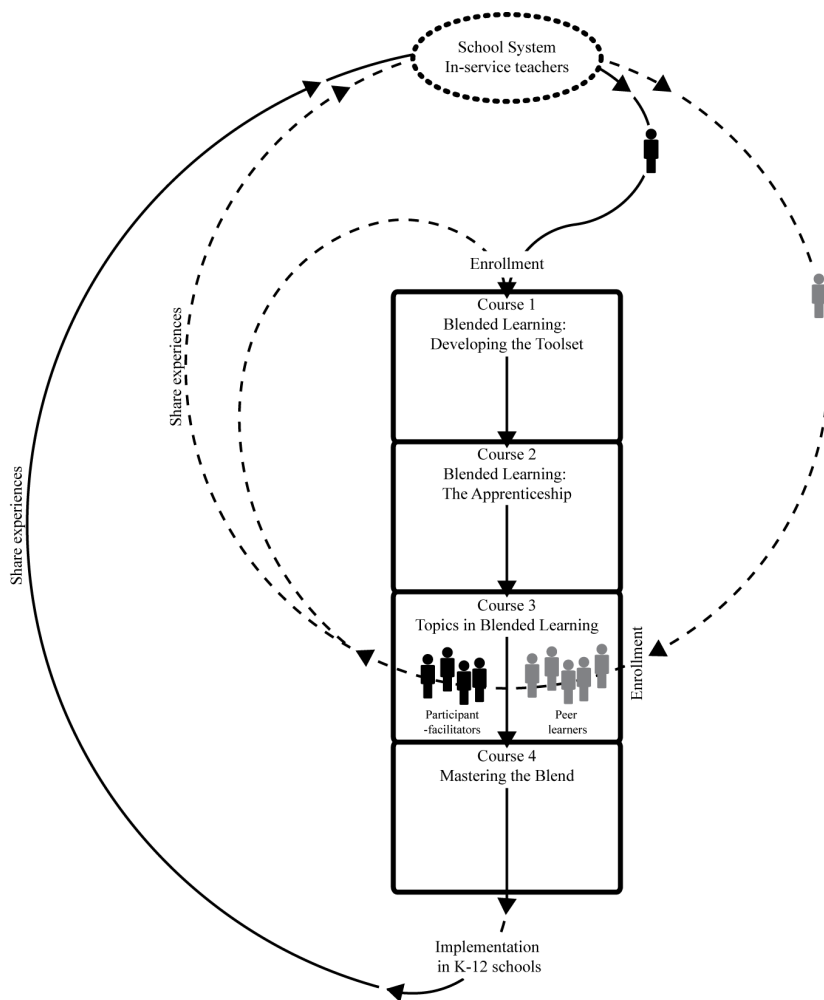
Figure 1. Program flow and participant enrollment/experience sharing cycle.

The participants of the program complete the courses successively, enrolling individually or as a small group (i.e., school district) in course one. The dashed lines in the figure depict our interpretation of how the learning community might unfold. Participants facilitate a blended learning experience in a friendly environment among a group of educators (peer learners) who know the participant-facilitators are "in training" and in the future are able to share their topic of blended learning project with administrators, districts, and most important—use this experience in their classroom. As the community builds through participants completing the program, it is our hope that the participants share experiences, successes and failures with the community and deepen their understanding and expertise in the area of blended learning.

The initial evaluation using the iNACOL Standards for Quality Online Courses rubric was beneficial in identifying aspects of the blended learning program in need of improvement. The results of the preliminary findings highlighted the following specific recommendations:

- Further develop instructional resources including the addition of more details on the assessment of assignments.
- Provide more student support including more detail on assignment requirements and the grading criteria for assignments.
- Enhance technological support for students and instructors.
- Provide more thorough review of accessibility.
- Provide more intuitive user interface.
- Create an ongoing schedule of course evaluations and updates.
- Decide on a coding scheme for rating learner progress using the iNACOL Blended Learning Teacher Competencies framework.
- Create a logic model describing inputs, outputs, and outcomes of the program.

These recommendations are being examined and, as appropriate, integrated into the program design and documentation. Reflections from the course designers based on the findings of the initial evaluation are recorded in Table 7 along with a plan for updates to the course series and documentation.

Table 7
Reflections and Direction Based on Preliminary Findings

Recommendation	Reflection and Direction	Status
Instructional resources – assessment of assignments	Rubrics are provided for several activities, but more details and guidance are needed, especially in communicating the social constructivist nature of the program.	In progress
Student support – assignment requirements and grading criteria	Rubrics are provided to students for the forum and workshop activities. Grading criteria or a rubric could be created for the weekly reflections and shared with the learners.	In progress
Technological support	Prerequisite technology skills are not provided and should be. The first course, however, focuses on familiarizing learners with the digital classroom environment which is expected to provide additional support.	In progress
Accessibility	The courses were designed with accessibility standards in mind, but they were not thoroughly tested and/or reviewed for compliance so there are areas that need improvement. For example, the videos should be closed-captioned and accommodations should be made for hearing impaired during the live sessions as well.	In progress
User interface	Some media – particularly videos – exist in the courses, but multiple formats would be beneficial. Streamlining of content and activities may improve navigation.	In progress
Course evaluations and updates	The courses will be evaluated and updated every three years. An evaluation schedule will be published with the instructor documentation.	In progress
Coding scheme for rating learner progress	A qualitative coding scheme should be selected. The phenomenographic analysis approach was chosen because it is intended to measure perceptions of what and how students learn.	Complete
Logic model	A logic model was created to accompany the program description.	Complete

A qualitative phenomenographic (Marton, 1986) coding scheme was chosen for evaluating participants' blog reflections to examine learners' perceptions and attitudes. The participants' progress through the course will be measured by the iNACOL Blended Learning Teacher Competencies framework. The phenomenographic approach is a qualitative research method used to describe the variables of how and what students are learning. It has been used to study students' approach to learning (how they learn) and to study how the student conceives of learning (what they learn) (Sandbergh, 1997).

In addition, a logic model was created to describe the overall impact and import of the program (Figure 2). The logic model outlines some of the additional concerns and expectations for the program. This logic model is expected to be provide stakeholders an overview of the resources and considerations required to run the program as well as the expected short-term and long-term outcomes of implementation.

Upon completion of the Mastering the Blend professional development program, participants are encouraged to continue their professional growth through the Blended Learning Masters professional learning community. The shared vision and endeavor, supportive environment, and a collaborative educational community that fosters growth are what the designers of the program envision for the Blended Learning Masters learning community. The foundation of the learning community starts in the first course and through this exposure, the hope is that participants will choose to continue participation in the learning community. The goal of the community environment in this program is to continue to make use of the tools with which the participating teachers have become familiar through the program, such as Moodle, Twitter, personal blogs, web conferencing, and instant messaging tools, as well as sharing the knowledge from participating in the courses with their peers, administrators, and in the school districts.

The concept of learning through participating in a community (Agosto, 2013; Dufour & Eaker, 1998; Lave & Wenger, 1991; Wenger et al., 2002) was a core element when designing the program. As an integral part of the design, participants engage in community building activities beginning in the first course, and then throughout the program. Expanding on the original work of Lave and Wenger (1991), Wenger et al. (2002) defined a community of practice as: "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (p. 9).

The Mastering the Blend professional development program is devoted to the study of blended learning, student-centered instruction, and effective practices. Through hands-on experiences and activities designed to uncover best practices, participants develop the ability to effectively integrate a variety of tools into a blended learning experience.

The goal to change participants' perceptions and attitudes towards blended learning can be measured using the iNACOL Blended Learning Teacher Competency framework (Powell, Rabbitt, & Kennedy, 2014), but the real measurement potentially occurs when the participants—in-service teachers—complete the courses and use what they have learned in their own classrooms. It is often said that teachers teach the way they have been taught (Lortie, 1975), but most teachers have not been taught using blended

learning. Teachers have been in an apprenticeship most of their lives, first in primary and secondary education (Kennedy, 1999), so allowing them to be taught using student-centered blended learning methods and then to practice teaching using their new skills will help them in their own blended learning classrooms.
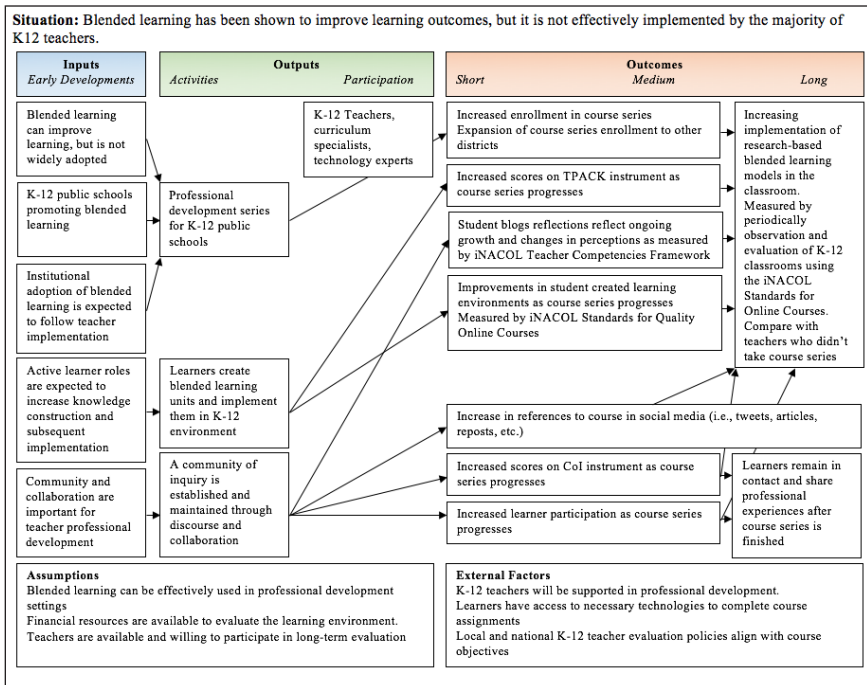

Figure 2. Becoming a Blend Master – A Logic Model.

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