Exploring Blended Teacher Roles and Obstacles to Success When Using Personalized Learning Software

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Schools are increasingly adopting adaptive learning software to better customize instruction to students' personal needs. While personalized software is not designed to replace the teacher, it does change teachers' roles and responsibilities. However, research is lacking that examines how teachers implement the software and use the provided data and resources to adapt their instruction to students' needs. In this case study, 11 teachers of English Language Learners (ELLs) participated in a 45-minute interview to better understand their perceived responsibilities when implementing adaptive learning software and their obstacles to success. The analysis found that teachers worked to support students by (a) orienting students to the software and learning expectations, (b) troubleshooting technical issues, (c) motivating students to fully engage with the software, (d) monitoring students' behavior and learning in the system, and (e) providing students with additional instruction in small groups or individually. While teachers recognized the need to provide students with individualized instruction using the assessment data and resources provided by the software, teachers largely did not feel prepared or able to provide students with the level of instructional support that they believed was needed. Specifically, teachers highlighted the following obstacles that prevented them from fulfilling their perceived instructional responsibilities: (a) lack of time, (b) lack of preparation and professional development, and (c) the inability to easily obtain and interpret learning data and resources. The article concludes with recommendations for both researchers and practitioners.

INTRODUCTION

Defined as the strategic combination of online and in-person learning, blended learning has grown in popularity (Miron & Gulosino, 2016; Molnar, 2017; Picciano & Seaman, 2009). While blended learning in higher education typically involves a reduction of in-person class time (Bernard, Borokhovski, Schmid, Tamim, & Abrami, 2014), K-12 schools have supervision responsibilities that typically prevent a reduction in seat-time. Instead, K-12 blended learning focuses largely on combining online and in-person learning in ways that provides students with some element of personalization or control in their learning "time, place, path, and/or pace" (Horn & Staker, 2015, p. 34). As a result, at the K-12 level it is difficult to separate blended from personalized learning.

Personalization decisions can be made by the student, teacher, and software (Graham, Borup, Pulham, & Larsen, 2019). While K-12 students play an important role in how their learning is personalized, they commonly lack the self-regulation and metacognitive abilities to effectively make educational decisions without teacher guidance and support (Cavanaugh, 2007; Weil et al., 2013). Time constraints due to high student loads and the lack of accurate and timely assessment data can be obstacles that prevent teachers from providing each of their students with the personalized support they require in a timely manner. As a result, schools are increasingly providing students with adaptive learning software to help ensure that students' learning experiences are personalized to their needs. As indicated by in the term, adaptive learning software adapts, or personalizes, instruction and support based on student in-software behavior and assessment data (Roll, Mclaren, & Koedinger, 2011). However, current adaptive learning software is limited to the algorithms and resources used to create it and often falls short of providing students with all of the support and personalization they require (Graesser & McNamara, 2010). While learning software programs can prove to be a valuable tool in blended and personalized learning, they are not intended to replace the teacher, and students still require teacher support (Wei-Fan, 2012).

Personalized, adaptive learning software has been especially popular in elementary schools to help students develop literacy skills (Chubb, 2012; Kliger & Pfeiffer, 2011). Developing literacy skills is especially important for English language learners (ELLs) who make up 9.4% of the total student population in the United States and growing (NCES, 2017). One of the challenges that face educators in helping ELLs succeed is their varying levels of language proficiency and instruction needs (Li, 2012). Unlike their native English-speaking peers, ELLs need comprehensive language support to ensure they are equipped with the required academic skills (Proctor, Dalton, & Grisham, 2007). According to a survey of ELL teachers in

California, the top challenges for teachers when working with ELLs were (a) the wide range of language and reading abilities of ELLs in their classroom, (b) lack of instructional time, and (c) lack of instructional tools (Gandara, Maxwell-Holly, & Driscoll, 2005).

While personalized, adaptive learning software has the potential to address some of the challenges teachers face when working to improve ELLs' literacy, we know little regarding the role of the in-person teacher when students are using an adaptive learning software. Understanding the roles of the blended teacher while implementing adaptive learning software can provide important insights into improving ELL achievement and engagement through personalized learning (Brooks, 2009).

The purpose of this study is to describe teachers' perceptions and experiences when ELL elementary students used adaptive learning software to personalize their learning and improve literacy skills. The following research questions guided the study:

1. How do teachers perceive their responsibilities when elementary ELLs personalize their learning using adaptive learning software?

2. What are teachers' perceived obstacles when attempting to fulfill their responsibilities?

LITERATURE REVIEW

Adaptive Learning Software and Blended Learning

Adaptive learning programs provide students with personalized activity sequencing based on their needs as determined by their in-system assessment data and behavior. The software also typically provides students with optional supports that they can choose to access to personalize their experience. In general, the sequence of activities is determined based on how students performed on an initial assessment that sets a learning path for each individual learner. In these programs, learners are required to complete a set of tasks. Some of these tasks serve as scaffolds to prepare students to complete a learning objective successfully (Roll et al., 2012). As learners complete a task, the difficulty of the next task increases or decreases, hence, providing students with an adaptive, personalized experience. Depending on the learning environment, supportive actions from the teachers are required to more fully personalize students' learning. For example, teachers can take on the role of scaffolding agents as they continually monitor their students' progress and assessment data to determine when further support is needed to improve students' personalized learning (Puntambekar & Hubscher, 2005). Teachers rely on the software and their personal observations to choose a set of resource to support students' personalized learning.

While research in K-12 blended environments is limited, researchers have suggested that blended learning environments can enhance student learning and improve pedagogy (Klobas & McGill, 2010; Ssekakubo et al., 2013; Ugur, Akkoyunlu, & Kurbanoglu, 2011). However, some argued that much more research is needed to understand how adaptive learnings programs influence blended teaching and learning (Klobas & McGill, 2010; Ssekakubo et al., 2013) and develop an understanding of the teacher role in blended learning environments. Klobas and McGill (2010) suggested that further research is needed to investigate teacher scaffolding when working with technology and the impact on teachers' daily teaching practices. Moreover, due to the widespread adoption of blended learning approaches, teacher-based scaffolding in personalized, adaptive learning programs have needed to occur in the absence of grounded research (Ugur, Akkoyunlu, & Kurbanoglu, 2011).

The adoption of adaptive learning programs in schools has increasingly allowed for more student-centered instruction and personalized learning (Chubb, 2012; Kliger & Pfeiffer, 2011). Blending technology with instruction allows teachers to provide students with a more personalized learning experience as they work with small groups or target individual students' needs (Chubb, 2012; Kliger & Pfeiffer, 2011). Implementing adaptive learning programs in blended learning environments allows for greater personalization due to the affordances of technology to differentiate and scaffold learning based on students' needs (Horn & Staker, 2011). In order to maximize the potential of adaptive learning software, the teacher role must be studied within the blended and personalized learning context (Brooks, 2009).

Blended Teacher Responsibilities

Graham, Henrie, and Gibbons (2013) explained, "Well-established scholarly domains have common terminology and widely accepted models and theories that guide inquiry and practice, while researchers in less mature domains struggle to define terms and establish relevant models" (p. 2). Researchers have yet to establish widely accepted frameworks that clearly identify and define K-12 online and blended teacher responsibilities but important work has begun.

Borup, West, Graham, and Davies (2013) used K-12 online and blended learning research and frameworks developed in both K-12 in-person settings and in online higher education environments to develop the Adolescent Community of Engagement (ACE) framework. The ACE framework identified and defined ways that teachers, parents, and peers could engaged with students to increase student engagement. Following the initial publication outlining and defining the elements of the ACE framework, the authors and their colleagues conducted several case studies that applied the

framework to a variety of settings to better understand teacher responsibilities at a full-time online charter high school (Borup, Graham, & Drysdale, 2014; Borup & Stevens, 2016, 2017), an online independent study program (Oviatt, Graham, Borup, & Davies, 2016, 2018), and blended environments where students took online courses while learning in a brick-and-mortar lab environment with an on-site facilitator (Borup & Stimson, 2019; Borup, Chambers, & Stimson, 2019). These case studies helped to refine the framework as well as identify responsibilities that were not originally included. Specifically, the following are the responsibilities identified across the case studies:

1. *Orienting*: helping students understand expectations, systems, and strategies for learning online.
2. *Instructing*: providing students with feedback and tutoring that directly impacts their understanding of the course curriculum.
3. *Organizing and Designing*: providing students with a learning environment and learning activities that foster learning.
4. *Nurturing*: establishing close, caring student-teacher relationships.
5. *Facilitating communication*: encouraging communication with and between students, parents, and other stakeholders.
6. *Monitoring and motivating*: tracking student progress and motivating them to be fully engaged in learning activities.

While results from these case studies can provide insights into blended teacher responsibilities when employing adaptive learning software to personalize students' learning, the ACE framework has yet to be applied in that type of learning environment.

METHOD

A qualitative case study was used for this research. Qualitative research allows researchers to study human interactions while examining a phenomenon within authentic settings (Creswell, 2009; Maxwell, 1996). Furthermore, case studies are beneficial when attempting to understand participants' perceptions and interpretations (Creswell, 1996).

Software and Setting

The adaptive learning program used in this study created personalized pathways that provided students with various language and literacy instruction that matched their abilities. A pathway was determined by an initial benchmark assessment that considered the academic ability of the student and then assigned each student the appropriate content. As students worked

through their learning pathways, students were regularly evaluated to determine what type of instruction they would receive and how much scaffolding they needed. The purpose of the continual assessments was to ensure that students were consistently kept on track at an appropriate level of rigor.

The program also provided teachers with resources to support them in the following responsibilities:

Teacher-led direct instruction: The program provided teachers with instructional materials and lessons for focused whole-class instruction. Teachers could print desired practice, review, and assessment activities. Teachers could also project interactive lessons or use them with an interactive white board to engage the whole class.

One-on-one intervention: The program's Action Areas Tool provided teachers with a dashboard showing where individual students were struggling or needed more scaffolding. It also provided the teacher with lessons focused on an individual student's needs.

Small-group instruction: Using the Action Areas Tool, teachers could group students based on common learning needs. Teachers could then use suggested printed materials and activities for target small-group interventions.

Participants

For this study, teachers were purposefully selected based on their use and experience with the adaptive learning software. More specifically teachers were only invited to participate if they were an elementary school teacher working with ELLs, had at least one year of experience using the adaptive software, and if their current students had class average usage of the software of 80 minutes a week or higher. Based on those criteria, we identified and invited 35 teachers to participate and 11 of those teachers accepted the invitation. Participants had an average of four years using the program. Of those 11 teachers, nine were female.

Data Collection and Analysis

Each of the 11 teachers participated in a 45-minute semi-structured interview that focused on the participating teachers' responsibilities and the obstacles that they encountered while implementing the adaptive learning program (see Appendix). The ACE framework was used to structure the interview protocol. All interviews were audio recorded, transcribed, and reviewed by participants for accuracy.

The lead author of this article coded the interview statements into as many different categories as possible while comparing the statements to previously coded statements—the "defining rule for the constant comparative method" (Glaser, 1965). The coded statements were then grouped into

similar categories. The grouping was guided by—but not limited to—the elements of Teacher Engagement as described in the ACE framework. The two researchers met frequently to discuss and review coded statements and how those statements were grouped into larger categories. When disagreements arose, they were discussed until resolved.

FINDINGS

Analysis of teacher interview transcripts found that teachers worked to support students' personalized learning by (a) orienting students to the adaptive software and learning expectations, (b) troubleshooting technical issues, (c) motivating students to fully engage with the software, (d) monitoring students' behavior and learning in the system, and (e) providing students with additional instruction in small groups or individually. In this section, we will discuss teachers' experiences and perceptions regarding each of these responsibilities. Following we will discuss the obstacles that teachers encountered when attempting to fulfill their responsibilities. Pseudonyms were used to protect teachers' identity.

Orienting and Troubleshooting

The orientation to the software and expectations generally took a week to establish the login routine and for students to become comfortable navigating the software independently. When asked what she did at the beginning of the semester to help students become familiar with the program, Pam responded, "Usually number one is to teach them how to get on." Participants also shared that it was important to model using the program to avoid complications later. For example, Michelle said, "I've showed it on the Smart Board a little, how you would log in. We gave them their little [password] ticket and we stood there and showed them [how to log on]." Kim stated, "When I'm ready to start I'll put up the computer, just the big one so they can see, I'll show them how to log in, and I'll put on the headphones too. I model it basically."

Eight of the participants stated that it was essential to set expectations on usage and commitment "from the very beginning." Thomas and others were required to set specific usage goals, "the goal was set to 100 minutes a week." Donna established accountability with her students by being "very clear about the rules and expectations for the computers" even though her students "really do enjoy [the software], so it's really never been a problem to get them on the program."

Teachers shared several obstacles that they encountered when attempting to orient students to the software including students' lack of simple computer skills, hardware issues, and network related issues. For Kim,

some of her ELLs were inexperienced with technology and she had to teach them "this is how you click the mouse." Teachers found it especially frustrating when students had never worked on computers before. Kim shared the following:

> I show them how to pause [the software], how to exit it, so those basic things. Then once they're on the first time I'll stand behind them to see if they're actually doing what they're supposed to do and if they have any issues once they've already started using it. They'll just raise their hand and I'll come and try to support them to move on to the next thing.

Joe echoed Kim's frustration at teaching basic computer skills when ELLs "don't really know how to use a mouse." Joe adopted a similar strategy to ensure that students were supported during this phase by "hovering over them" and making sure they are not pausing "too often."

Teachers stated that they did not have the time to stop their instruction to support each student who encountered an obstacle on the program. As a result, five of the participants shared that they recruited successful students to help their peers. For instance, Donna found there was usually one or two more-skilled students that became the "computer people" that other students would turn to for technical support. Similarly, Carrie designated students in the "upper grades, usually third and fourth [grade]," as "learning monitors" who could "be called on to show children what to do."

Even once students were comfortable navigating the software, 10 teachers found that they needed to regularly troubleshoot technical issues. Carrie shared that when there were "a lot of glitches" she "wasn't always free to work with a group [of students], because you were trying to troubleshoot" or calling the technical support line. According to Charity, the need to troubleshoot was evident throughout the year and she felt little support from the in-building technical support staff who "were too busy fixing other stuff." As a result, at one point she resulted to going to "all the classrooms and re-download the program" in an attempt to remove any bugs from the program. Similarly, Thomas had to deal with technical issues "very frequently." He felt that they were "highly irritating to fix" and regularly spent "10 to 15 minutes of planning time" to ensure the computers "were not acting up." Although not always timely, the 10 teachers who reported technical issues also found that they would eventually be resolved and appreciated having support onsite and virtually.

Motivating

The majority of teacher participants (n=7) expressed that low student engagement or off-task behavior was not a major concern for most of their students. They attributed the high level of student engagement to the design of the adaptive software that helped to personalize student's experience. For example, Carrie shared, "I never felt like [low student engagement] was ever a problem, because they loved the program so much." She was especially thankful that students found the program engaging because it afforded her more time to provide personalized instruction to small groups of similar students while the majority of students worked on the software.

While teachers found that the personalized nature of the software made it highly engaging to students, they still worked to ensure that they maintained high levels of engagement. For instance, teachers commonly praised students for engaging and progressing in learning activities. Ten of the teachers shared that the built-in reward tool from within the software helped students to stay motivated by providing them with reward points. These teachers also commonly printed achievement certificates provided by the program. For example, Michelle stated that her students appreciated having a tangible certificate to hold on to: "I'd print the little certificate that they had earned at that point in time. That was a huge hit. They loved it."

Teachers also felt that parent involvement was a critical component to student motivation. However, six of the participants stated that parental involvement was lacking. To engage parents, Terresa shared usage data with parents "on a weekly basis." At parent-teacher conferences, Pam would provide letters to parents that said, "This is how to get on. This would be great for you to use at home. It builds that home/school connection." Pam added that parents would commonly ask, "How can I help, because I can't speak the language?" She would "always tell them, 'This [software] is a great way.'" Kim also used report cards as a way to praise students and to inform parents of the progress made by the student in the software, "When we have report card time I write it down on their comments and I tell their parents they did such a great job on [the adaptive learning software], and I always write down … 'Keep up the good work!'"

Monitoring Behavior and Learning

The personalized learning experience allowed each student to progress at a unique pace and path. As a result, teachers worked to monitor student behavior and learning using traditional types of observations as well as using the monitoring tools built into the software. Terresa explained that she would commonly walk around the room to monitor student behavior, "Now that was really easy for me to monitor because I could see all of their

screens while they were on it." Similarly, Pam shared that the ability to see students' screens allowed her to "really see if they're not being on [the software]."

In addition to walking around the room and viewing students' screens, teachers found it helpful that the software provided a dashboard that allowed them to see patterns in students' online behavior including login frequency, "time on task," and "if they've been idle." Joe referred to the light bulb feature in the program that alerted teachers when students became idle in the program. He explained, "I have a bunch of strategies to do that. One of them is to … identify is when the light bulb comes up. So like either they're just sitting there for a long time and then they either raise their hand or I peek and I see that. That's a nice cue."

All participants acknowledged the importance of monitoring students' learning and misconceptions. In fact, the software provided teachers with a tool for monitoring the skills that students had mastered was well as the Action Areas Tool that allowed teachers to monitor students' "failed skills." Seven of the teacher participants reported that they checked the Action Areas Tool dashboard to monitor student progress at some point during the semester. However, only three of those teachers shared that they did so frequently. Although other teachers monitored student progress less frequently they found that the learning data was especially helpful when they met with other teachers, school administrators, and parents regarding a student. For instance, Michelle stated that throughout the year she would attend response-to-intervention meetings where teachers, administrators, and support staff would review individual student progress. She found that the software-provided data gave an "additional data point to show what progress that they were making and what site words and vocabulary they had retained and if there were any issue in the phonics area."

Teachers tended to monitor their students' failed tasks more than the skills that they mastered. Kim shared, "So I'll go and I'll see where the kids are, who's weak on what, and it's very interesting to me." Teachers were more engaged in monitoring students' failed skills than students' passed skills because the information was more actionable and helped them to target their small group or one-on-one instruction. Teachers also found the tool helpful because it actually grouped students based on common failed skills. Terresa, who checked students failed skills twice a week, found the tool helpful in her efforts to personalize students' learning because it allowed her to "group students for review and remediation based on the need for intervention as the program." Chloe summarized that the tool was helpful "to create different instructional groups based on different skills."

Instructing

Teachers appreciated the flexibility that the software provided them to work with students one on one or in small groups so that they could better personalize students learning experience by targeting students' misconceptions identified by the adaptive software. As stated above, teachers appreciated it that the Action Areas Tool both highlighted students' misconceptions and grouped students based on commonly failed skills. Furthermore, the tool provided teachers with a variety of resources that they could use in their small group instruction to target students' misconceptions. Pam appreciated the resources because, "you don't have to reinvent the wheel and be creative when it's right there for you… It's also very helpful, and I think makes it very easy for me." Paula added that the intervention activities were short enough that they could be easily worked into her limited time with students. However, in practice, teacher participants explained that they did not utilize the resources as much as they would have liked as explained in the following section.

Obstacles: Lack of Time, Professional Development, and Support

While teachers monitored students' behavior and personalized learning and accessed resources to support their small-group and one-on-one instruction, they did not do so as frequently as they would have liked. As a result, many students' personalized learning experience was limited because they used the software in isolation of in-person learning activities. Teachers identified three obstacles to fully implementing software and blending it with their targeted, in-person, small-group instruction.

First, because teachers' time was spent working with students in class, they had to work outside of class time to monitor students' learning and prepare for targeted small group instruction. This was time that teachers commonly stated that they did not have and felt overwhelmed trying to fulfill all of their responsibilities. Thomas indicated that "you have to prioritize it and to getting the time in because if you don't, little things creep in. You kind of have to fight for the time." Kim stated, "My problem is that this year I was pulled to do so many other things that my planning time was used up with doing so many other things, so it's a matter of time and planning."

Furthermore, Paula found that students' time on the adaptive software was so limited that she opted to maximize students' time on the software rather than pull them off the software for small group instruction. She summarized, "I think that that's why a lot of the classroom teachers don't use as many things as they might. It's because there's a time constraint." Teachers also felt some pressure from administrators to maximize students' time in the system and meet administrator-set goals. Thomas shared the following: "In the middle of the year the coordinator of all the regions came to the

school and went to the principal and was like… 'There's not enough time usage and I need it more used.'" Carrie found that it "was hard in the beginning to get everybody on as many minutes as they needed."

Second, when teachers would make the time to review students' learning data or the software-provided resources, they found that they were confusing and not presented in intuitive ways. Donna shared that it was very challenging to understand the software-provided data, "It's just finding the data because we have different programs, different lists, and getting data from all of them, it gets overwhelming. It's definitely been the challenge." Carrie echoed Donna's perception and implied that the learning data was overwhelming to understand, "There is so much data, that sometimes you have to filter through all the data." When asked for suggestions on how to improve the dashboard for teacher use, Chloe suggested that she would like the teacher dashboard to be "less complicated to get what you want. There's too many tabs, there's too many different things. It's kind of hard to find what you're looking for sometimes."

In addition to finding the personalized learning data to be overwhelming and confusing, nine of the participants revealed that they were overwhelmed with the supplemental learning resources provided by the software. While Donna found that the resources were high-quality, she found that number of resources too much to navigate and found herself asking, "Where do I even start?" She added, "Sometimes we get so many resources coming at us from every angle, it gets a little overwhelming." In fact, she believed that "you really do need a second person" to learn and manage the learning resources. Kim, who set a goal to spend 40 minutes a week reviewing resources, shared the following: "Is that enough time? No, but it's better than what I've been doing and it would give me time to see what are they lacking in, or what are they getting all right." Similarly, Pam admitted to using the tool "not that often" but added, "If I had more time in my day and less teaching time I would use it more." In speaking in regard to her school administrator she said, "I just wish that they would give you more time, because it's such a useful tool." Donna summarized, "there's just not enough time in the day, honestly."

Lastly, most participants indicated that there is a lack of adequate professional development. In fact, Joe stated, "I haven't received any training on [the software]." Particularly, teachers felt a high need for professional development to better understand the software-provided data. For example, Paula indicated that the reports are difficult to understand, "The reports, for whatever reason, seem to be a struggle." Donna also expressed that she needed professional development on how "to navigate all the data." Furthermore, participating teachers wished that other teachers had more awareness of the software and how it can help to provide students with a personalized

learning experience. Specifically, five of the participants reported that the lack of buy-in from their team members to be challenging. Thomas became frustrated when others were "not on board with what's going on or they're not even aware of what it is, you can feel that, 'oh, they're just sitting them on their computers.'" Paula found that initially "teachers are understandably a bit skeptical" but found that when they were shown the software's affordances they would "have a better appreciation for the program." Pam summarized, "We've had some teachers who have really kind of bought into it and then some that haven't."

DISCUSSION

This qualitative case study described eleven ELL teachers' perceptions and experiences when using adaptive learning software to personalize students' learning of English language skills. By focusing on teachers' responsibilities, this research provides insights into students' needs not fully addressed by the software. In other words, rather than focusing on what adaptive software can do, this research helps us to understand what the software does not do and how teachers can help to fill those gaps to provide students with a more complete personalized learning experience. According to Brooks (2009), understanding the roles of the teachers while implementing adaptive software in blended, personalized learning settings provides insights on how to improve ELLs' achievement and engagement.

Teachers found that they had to orient students to the adaptive learning software and troubleshoot technical issues. Both responsibilities focus on improving students' ability to effectively use the software. Lowes and Lin (2015) explained that learning in online and blended courses can be especially challenging for students because "students not only need to learn a subject online but need to learn how to learn online" (p. 18). This is especially true in learning environments where students progress at personalized paces using personalized paths. Because the adaptive learning software was at the core of students' personalized learning, it was critical that they be able to seamlessly use the technology. Hillman, Willis, and Gunawardena (1994) summarized, "Regardless of the proficiency level of the learner, inability to interact successfully with the technology will inhibit his or her active involvement in the educational transaction" (p. 35). Any classroom of students can have a wide range of technological abilities, but this is particularly true of ELLs who come from a more diverse educational and cultural background. Teachers found that some students required instruction on "how you click the mouse" and it was especially challenging to address each student's technological needs. Graham, Borup, Pulham, and Larson (2019) identified technical literacy a foundational skill for blended teacher readiness. Technological issues can be especially discouraging to students

and de la Varre, Irvin, Jordan, Hannum, and Farmer (2014) argued that troubleshooting help should be "readily accessible and on hand" (p. 338) when students are learning online. While the teachers attempted to trouble-shoot students' technological issues, at times it was beyond their capacity to help all of their students. Some teachers also noted a lack of technological support at their building because people "were too busy fixing other stuff." Previous research has also found that blended learning facilitators required more professional development regarding troubleshooting skills (Roblyer, Freeman, Stabler, & Schneidmiller, 2007). More research is needed that ex-plores this and other pragmatic solutions to this issue when students' learn-ing is personalized using adaptive learning software.

Roblyer et al. (2007) stressed the importance of the blended teachers "working with students day by day" to maintain student motivation. This is especially true when students' learning path and pace are personalized and dependent on student engagement and time on task. Teachers in this re-search monitored students' engagement by walking around the room while students were using the adaptive learning software and looking for indica-tors of low engagement. Teachers also found it helpful that they could moni-tor all students' screens simultaneously using a tool built into the learning software.

While teachers' presence likely helped to ensure that students stayed on task, teachers reported that students were largely motivated and maintained a high level of engagement. They attributed students' motivation largely to students' personalized learning experience while using the adaptive learn-ing software activities as well as the built-in reward tool that automatically provided students with reward points. Some teachers also capitalized on other engagement features such are certificates and reward system. Zhuha-dar, Coleman, and Marklin (2016) argued that from students' perspective this type of gamification of education is a natural addition to their experi-ences using tools such as Amazon and Netflix and predicted, "In the com-ing years, students and workers will have greater control in defining their own personal continuum of learning that corresponds to their lifestyle" (p. 34). As these gamification techniques increase, researchers should examine both their negative and positive impacts to students' motivation and per-sonalized learning. For instance, Abramovich, Schunn, and Higashi (2013) found that digital badges increased middle school students' motivation but it was also associated with "counter-productive educational goals" (p. 229). The authors summarized that they found "evidence suggesting both positive and negative effects" of digital badges (p. 229). This highlights a complex connection between instructional design, personalized learning, and student motivation. Research on instructional design in K-12 blended, personalized learning environments is especially limited (Rozitis, Tomaselli, & Gya-bak, 2018). When examining student motivation in personalized learning

environments, researchers should broaden their view to include both the instructional design of activities and the rewards that are provided to students for their engagement and successes.

Chubb (2012) and Pfieffer et al. (2011) argued that blending technology with instruction allows teachers to capitalize on assessment data to engage students in small groups with more personalized instruction. However, in practice teachers found it highly difficult to monitor students' personalized learning and plan instruction that targeted learning gaps. Although the software dashboard provided teachers with several monitoring tools, some teachers felt that the dashboards proved confusing, and they did not have enough time to regularly analyze the data. In fact, while participants realized the importance of monitoring students' learning data, only three teachers reported that they frequently monitored students' "failed skills." Similarly, the system provided teachers with a variety of resources that they could use in their small group instruction to target students' misconceptions. However, these resources went largely unused because they proved difficult for teachers to access. Staker (2011) highlighted the practice of using "a data dashboard to plan targeted interventions and supplementations throughout the day" but this is only practical if the dashboard and the accompanying instructional materials are easily accessible and understood. While researchers have highlighted the importance of data dashboards (Adams Becker, Freeman, Giesinger Hall, Cummins, & Yuhnke, 2016; Dickson, 2005; Rice & Carter, 2016; Zhang & Almeroth, 2010), more empirical research is needed that actually examines teachers ability to effectively use them in personalized learning environments. Software developers also need to ensure that all users—students and teachers—have positive experiences using the tool.

Participants believed that they would more frequently monitor students' learning data and use the provided resources to personalize students' learning if they were provided with more time and professional development. Both obstacles are commonly cited as obstacles to change in schools. Collinson and Cook (2001) explained that "time is one of the greatest constraints to any change process, whether at the individual, classroom, or school level" (p. 266). Professional development is also especially important for blended teacher success because blended teaching requires skills not typically needed for in-person instruction (Pulham & Graham, 2018). Furthermore, teacher-preparation programs have largely failed to prepare teachers for blended, personalized learning environments, shifting the burden to school districts (Archambault, Kennedy, Shelton, Dalal, McAllister, & Huyett, 2016). Research on the topic is especially limited. Blended, personalized learning initiatives, including those using adaptive learning software, would benefit from empirical research that seeks to identify effective and efficient strategies for preparing blended teachers.

CONCLUSION

Elementary schools across the United States are increasingly using adaptive learning software to provide students with personalized learning activities based on students' ability. However, little is known regarding how teachers support students' personalized learning when using adaptive learning software or the challenges that teachers encounter when they attempt to fulfill those responsibilities. In this case study, 11 teachers of ELLs were sampled and participated in a 45-minute interview. The interview analysis found that teachers' perceived responsibilities were (a) orienting students to the software and learning expectations, (b) troubleshooting technical issues, (c) motivating students to fully engage with the software, (d) monitoring students' behavior and personalized learning in the system, and (e) providing students with additional instruction in small groups or individually. While teachers recognized the need to provide students with personalized instruction based on the assessment data, they found it difficult to do so due to the lack of time, professional development, and data dashboards and resources that were easily accessed and used.

Based on these findings, we recommend that more effective and intuitive data dashboards and instructional resources be developed and included in adaptive learning software. We also recommend that teachers be provided the time and professional development they require to fulfill their responsibilities. This research can provide some insights to those developing professional development but more research is needed that identifies teacher responsibilities, the obstacles that they encounter, and strategies for overcoming those obstacles.

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APPENDIX

Introduction

- How long have you used [name of the software omitted] with your students? What type of learners are using [name of the software omitted]? ESL, struggling readers, or students with special needs?

- What has been your general perceptions about using [name of the software] for language teaching? Do you believe that [name of the software omitted] has improved students' learning? Has [name of the software omitted] met your expectations?

- Can you describe [name of the software omitted] implementation at your school/classroom? What's a typical day of [name of the software omitted] implementation at your school?

Roles, Responsibilities, and Obstacles

- Have your roles changed as a result of implementing [name of the software omitted]?

- How specifically do you see as your roles when using an adaptive computer program?

- Do you do anything at the start of the semester to help students to become familiar with [name of the software omitted]?

- Do you have to troubleshoot any tech issues for students or does the program run smoothly?

- Has [name of the software omitted] changed how you interact with students?

- Has the use of [name of the software omitted] had any impact, positive or negative, on your relationships with students?

- How do you know if your students are staying on-task and engaged during their time on [name of the software omitted]?

- When students are not fully engaged in the learning activities, what, if anything, do you do you motivate them to increase their engagement?

- How do you monitor students' progress and learning in [name of the software omitted]?

- Do you access the portal to monitor students' progress? If so, how often?
- How do you know when a student is struggling to master a concept?
- What types of data in the portal/dashboard do you look for when monitoring students' progress?
- How do you recognize students' achievements/successes on the program?
- What do you do with the progress data? Do you share it with students or parents? Or other teachers?
- Are you familiar with the teacher resources? (if no, move to the next question)
    - Walk me through how you used the resources?
    - In what settings do you use them? Was it in small group or whole class?
- Are you familiar with the Action Areas tool?

  1. If yes,

     How did you become familiar with the Action Areas tool?
     - How often do you use it?
     - Walk me through the process?
     - How do you know that the students understood the concepts retaught?
     - Do you go back and check the data to see if students are successful?
     - Do you use it for one-on-one or small group instruction?
     - How long do the sessions last? Do you think that is enough time?
  2. If no, Do you think students would do better if you use the resources available for intervention after they spend their session time on the program?
- Have you provided students with supplemental or remedial instruction? If so,

  1. What prompted you to do so?

  2. What did the instruction look like and how long did the sessions last? Was it whole class, small group, or one-on-one?

  3. How do you ensure that your instruction targeted students' need?
- Do you have enough time to work with students using the data provided from [name of the software omitted]?
- What is the single biggest advantage of combining [name of the software omitted] data and classroom instruction? What are the major limitations?

- Have you ever designed remedial learning activities in addition to the ones that are provided by [name of the software omitted]?
    - If so, why did you design them and how well did they work? What makes them unique from the lesson plans found in [name of the software omitted]?
    - If not, why didn't you feel the need?
- What was the biggest challenges of using [name of the software omitted]?
- What support you wish you had to address these challenges?
- What was the best part of using [name of the software omitted]? What was the biggest success of using [name of the software omitted]?
- What can be done to improve teacher experience with [name of the software omitted] dashboard?
- Are there any features of [name of the software omitted] you have not used but would like to?
- Have you received any training on [name of the software omitted] offline resources for instruction?
- What professional development do you need at this point? Have you received any technology training?

Conclusion

- What advice would you give other teachers who are implementing [name of the software omitted]?
- Is there something that I didn't ask that I should have? Is there anything else that you would like to add?