# Using a Faculty Training and Development Model to Prepare Faculty to Facilitate an Adaptive Learning Online Classroom Designed for Adult Learners

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*Adult learners do not thrive under the classic lecture model and instead are more likely to thrive in individualized classroom environments. Over the past decade, higher education has become more participatory, emphasizing application and professionally relevant content. Technology has been increasingly utilized to enhance and individualize the student experience. Adaptive learning technology offers the opportunity to demonstrate knowledge and customizes the classroom experience without over-burdening the instructor. Faculty use student results from the adaptive learning components to determine what additional support is needed. Accordingly, faculty training and development shifts to focus on student engagement, individualization, and pedagogical development utilizing technology.*

## INTRODUCTION

People often picture college students as the traditional 18-year-old freshmen leaving home to spread their wings, but in postsecondary education programs, there are now more students who fit into the very diverse population type known as nontraditional learners. Nontraditional learners are those who waited before continuing their education after high school, are not fiscally dependent on their parents, are often parents themselves, and/or work full time while going to school. These students now make up more than 5/6 of the student population, particularly in online education (Upcraft, Gardner, & Barefoot, 2005). Many studies, such as the one conducted by Bergmann and Zepernick, noted nontraditional students seek to be "agents of their own learning, rather than as recipients of an imposed curriculum" (2007, p. 128) which may explain their increasing demographic in online programs that specialize in active learning andragogy.

Adult education theory has maintained for decades that nontraditional students learn best when they understand the connection between the theoretical concepts they learn in the classroom and their extrinsic goals and experiences (Kolb, 1994). It is unfortunate that historically, "teachers have been painfully slow to transform the ways they teach" even when teaching in innovative, technologically driven platforms so that "the student-centered, hands-on, personalized instruction envisioned by ed-tech proponents remains

the exception to the rule" (Herold & Smith, 2015). Even online courses tend to be formulaic, using standardized and templated curriculum (Melkun, 2012) based on conventionally standard course styles designed for traditional college students (Coulter & Mandell, 2012).

For too long, online educators have attempted to teach nontraditional students using traditionally established methods that are not derived from and do not address the needs of nontraditional students which often includes adult learners. Yoo and Huang (2013) argue this approach "might have caused many motivation and engagement issues in online programs that could have ultimately impacted degree program completion and dropout rates" (p. 152). Furthermore, it has led, as seen in "The 2016 Inside Higher Ed Survey of Faculty Attitudes on Technology," to the belief by online instructors that online education cannot "achieve equivalent outcomes to in-person instruction" (Jaschik & Lederman, 2017). Online education needs a paradigm shift, which must come in part, as Donavant, Daniel, and MacKewn (2013) argued, from understanding that while students should be expected to adapt to university requirements, universities themselves must adapt to the needs of their non-traditional populations as well.

**Adaptive Learning**

Coffin, Murray, and Perez (2015) explained, "educators have long known that learning is improved when instruction is personalized – adapted to individual learning styles." Yet, students entering higher education vary in their knowledge, experiences, and motivations, which can often create challenges for educators to create this personalization. Adaptive learning systems can address this variability by adapting content based on differences in student skills (Brusilovsky & Millán, 2007) and allowing students to study at their own pace (Kara & Sevim, 2013). Adaptive learning emphasizes personalization through differentiation and adaptation, which creates a more robust learning experience for the student and aligns with the principles of adult learning. Adaptive learning systems have been increasingly adopted into higher education courses in an effort to develop a successful paradigm for adult learners, particularly in online education following a trend of using teaching technology, or teaching machines, dating back to the 1950s (Kara & Sevim, 2013).

Andragogy, the theory characterized by the importance placed on adults' need for self-directed learning, is based off the premise that learning occurs only when students experience a need to learn. Here is a large reason why adaptive learning has so much potential for adult learners. When using adaptive learning systems, learners are given the specific opportunity to mold their formal education which increases their competence and moves them towards the end goal of achieving one's full potential, which Knowles (1980) argues is a key motivator for adult learners. Zembylas's (2008) study found that a number of positive motivating emotions felt by online students that push them to propel forwardincluding enthusiasm and excitement for the flexibility of online programs, surprise at the ability to make connections online, and pride in their accomplishments. In addition negative emotions likely to hinder motivation and persistence include fear and anxiety of the unknown, alienation, and stress and guilt over their inability to effectively balance everything in their lives (Zemblya, 2008). Adaptive learning gives students the opportunity to focus on the areas of learning they need most while freeing up their time, thus relieving some of their guilt and anxiety when knowledge can be demonstrated on a specific topic.

While adult learning theories align theoretically with what adaptive learning seeks to accomplish, the effectiveness of adaptive learning in practice must also be considered. Research on adaptive learning tends to focus on the degree to which student succeed in mastering targeted learning objectives or outcomes, and the published results are mixed. Despotovic-Zrakic et al. (2012), for example, stated that students taking an adaptive learning version of a course did 11% better on scores on a business exam compared students who completed a non-adaptive learning version of the same course. Fischman (2011) found that 99 % of students completed their formal logic course via adaptive learning versus 41 % who took the class traditionally (p. B12). In Wang, Wang, and Huang's 2008 study, adaptive strategies that allow students the opportunity for self-directed learning were shown to lead to student success (p. 2463).

On the other hand, other studies (see Griff & Matter, 2013; Schunn & Patchan, 2009; Lovett et al., 2008) conclude that adaptive learning technology does not in itself improve quality of learning (based on concurrent validity using objective tests administered at a course's end) compared to non-adaptive

learning course versions. Similarly, Lovett et al. (2008) report that student learning was no worse in adaptive learning courses compared to their non-adaptive learning courses, and, when measuring skills six months after course completion, performance on a skills test appears at least as good for the students who took adaptive learning courses compared to those who did not take adaptive learning. Another study found that 11 percent of students scored higher on a business test using an adaptive learning model (Despotovic-Zrakic, et al. 2012). Wang (2008) found that the adaptive strategies developed for courses allows students the opportunity for self-directed learning which led to student success courses.

If, as Yoo and Huang (2013) maintain, there is a direct correlation between the expectations of adult learners and their overall satisfaction and persistence, then ensuring that instructors understand how to meet those expectations in classroom settings becomes vital, especially when incorporating adaptive learning technology into classrooms. Fincher (2010) argues that the most important step in increasing retention of adult learners is to enhance learning strategies, part of which must include designing them with adult learner needs in mind (Mezirow, 1981). As such, Koohang, Riley, and Smith (2009) point out that ensuring that learning takes place in online classroom environments has to be the number one priority in online instructional design. Kenner and Weinerman (2011) concur with this theory, adding that curriculum, including adaptive learning technology, has become the area most likely to fully engage adult learners who are much less likely to become tied to their education through social experiences as seen in traditional settings. Yet, much of the published research does not consider the instructional approaches used to implement the adaptive learning technology.

Adaptive learning systems offer the opportunity for instructional methods to become personalized to the student, helping students to focus on those areas of need while also highlighting for them areas of personal strength in their knowledge. Adaptive learning methodology is based on what learners actually need to learn, rather than frustrating students by overloading them with materials or forcing them to focus on areas where they already have mastery (Wang, Wang, & Huang, 2008). Adaptive learning systems offer the prospect of tailoring curricula to students based on their varying knowledge, interests, and background (Brusilovsky, 2001; Brusilovsky & Millán, 2007). They "adjust to what the learner's interactions with the material suggest about his or her mastery of the materials over time and, based on the learner profile it develops, will begin to anticipate things about the learner and serve up content based on knowledge of that profile" (Newman, Stokes, & Bryant, 2013).

However, as Ashman, Brailsford, and Brusilovsky (2009) explained, "people are extremely complex, and any attempt to model human behavior is always likely to be somewhat approximate. Any automated personalization system can only be as good as its underpinning user model, and any failure of the user model can have significant consequences" (p. 4). Used properly, technology can also enhance existing models of instruction. The interaction between student and faculty should be the central focus. Both the instructor and student are interacting with the technology, but they are also interacting with each other and this then becomes the foundation for learning.

**Faculty Training and Development Model**

As online learning has become more established and growth rates appear to be reaching some sort of stabilization, ensuring that online educators understand their students' needs and motivations has become a priority. This is especially relevant as online courses can be more demanding in terms of personal discipline; at the same time, the students most likely to enroll in these courses are at-risk nontraditional learners balancing education amongst many other high priority personal and professional responsibilities.

For adaptive learning systems to be truly effective in a classroom, faculty training and development must be a core element of introducing the technology into the curriculum, and it must be done using specific pedagogical approaches aimed at the target student demographic. Incorporating the adaptive learning technology without sufficient pedagogical training are of questionable value, as Mezirow (1981) foresaw when he argued that programs and classrooms filled with adult learners that do not fully address the differences in goals and learning needs of adult learners. Therefore, faculty training and development are crucial to the successful adoption of adaptive learning technology. The value of the technology comes

not just from its standalone use but from how instructors use the technology to individualize the classroom to meet student needs.

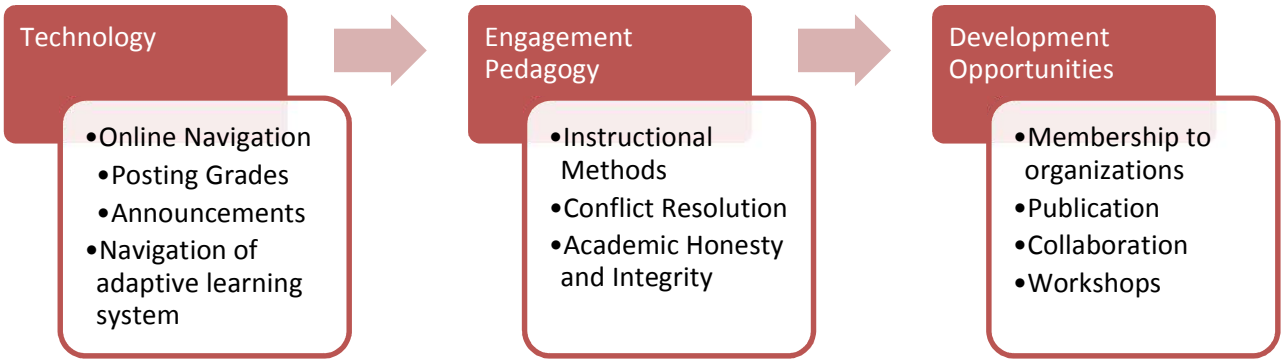
Many professors only understand the pedagogy of teaching traditional students (DeVito, 2010), and they rarely attempt to modify instructional styles for classrooms comprised of nontraditional learners even when adaptive learning technology is present (Donavant, Daniel, & MacKewn, 2013). Despite expert recommendations arguing otherwise for several decades, most of these classrooms follow a teacher-centered model of directly transmitting information to students rather than the recommended learner-centered method of facilitating learning (Schierling, 2013; King & Huer, 2009; Coulter & Mandell, 2012). Similarly, faculty training and development may not consider the instructional application of technology in the classroom, and focus mainly on technological use and navigation. Faculty training and development for instructors incorporating adaptive learning technology should be augmented to connect andragogy with the features and use of the technology.

A standard faculty development model (See Figure 1) tends to have three areas of focus: technology, pedagogy, and development. Although the use of technology is included in this model, it may only focus on the navigational components of the online classroom such as how to post grades and announcements; similarly, with adaptive learning systems, training may only emphasize the basic navigational elements of how to use the adaptive learning technology. This ability to use the technology is separate from the pedagogy, and therefore limits the full use instructional use of the educational technology to enhance the student experience.

The second element of traditional faculty training and development model, pedagogical training for online facilitation, generally focuses on components of engagement and classroom management. For example, a pedagogical training may focus on the effective use of course communication and messaging such as what information should faculty members communicate and with what frequency should these communications be delivered to encourage student participation in learning activities? In these instances the technology is merely used an invitation to participate in learning experience. Additional pedagogy follows along adult learning theory and andragogy such as making learning immediately applicable or relevant, encouraging the students to draw on existing skills, and so forth. Often this training will focus on communication strategies as well as faculty member research to bring current and impactful practice into the course environment. The connection between the technologies within the course as a tool for instruction is not emphasized.

The final tenant of a traditional faculty training and development model focuses on faculty members engaging in professional development activities. This may mean that they are not necessarily developing instructional ability. For example, a faulty member can become a member of a professional organization, publish a paper, or present their content expertise at a conference. Faculty may also have the opportunity to collaborate with other faculty or participate in additional workshops and training. These activities are all impactful to the classroom and essential for faculty member advancement and improvement, especially when working with a demographic of adult learners. Yet, a faculty member who chooses to focus on course content instead of instructional methods may find themselves stilted when attempting to engage students through adaptive learning without sufficient pedagogical support.

**FIGURE 1**
**TRADITIONAL FACULTY TRAINING AND DEVELOPMENT MODEL**

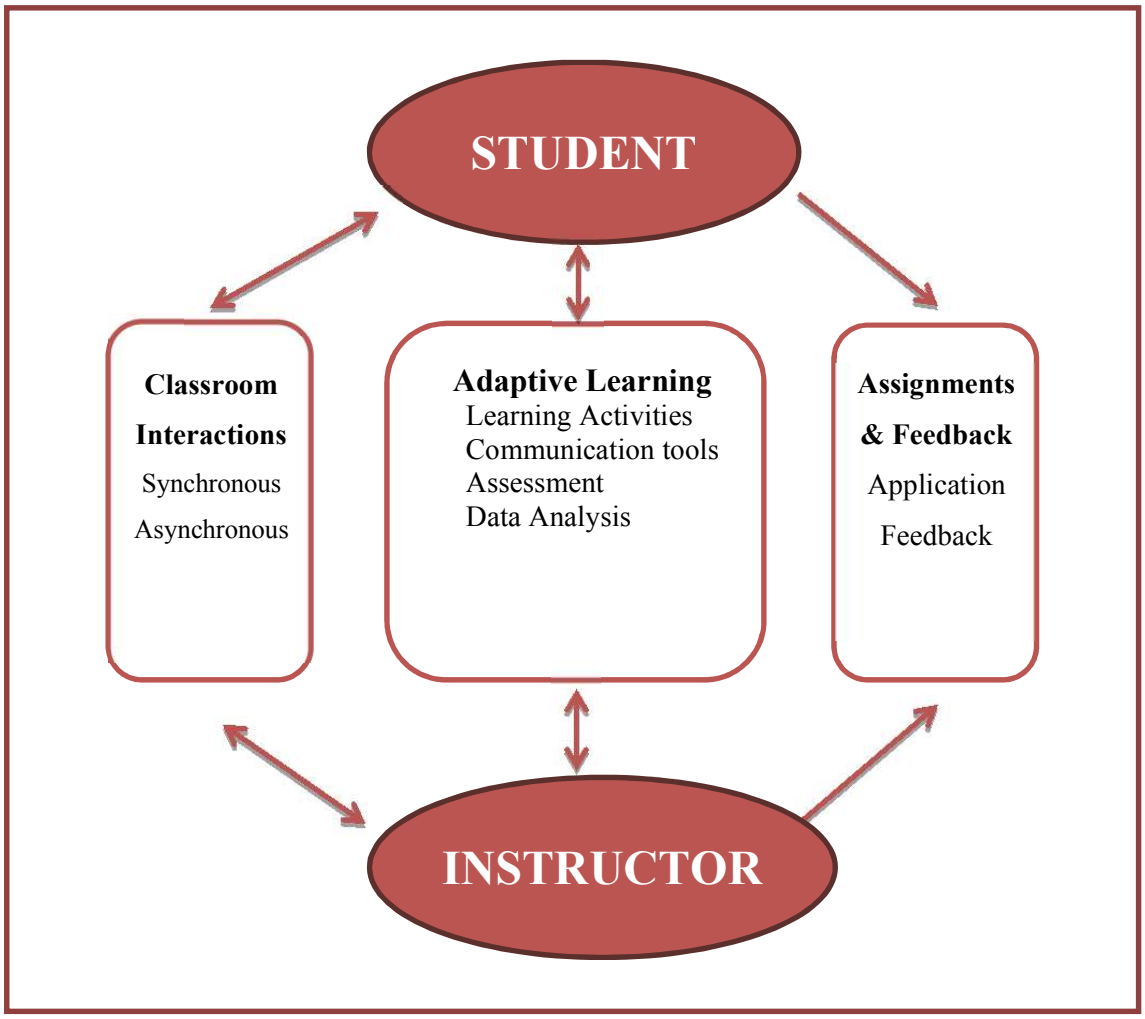



Faculty training and development can be very effective; however, the traditional model does leave the faculty member responsible for making the connections between the three separate factions. Without guidance, instructors may run the risk of failing to connect concepts of educational technology to effective instruction. This may continue to leave some faculty members exceptionally knowledgeable in their subject area while struggling in their instructional ability. In this case, the adoption of adaptive learning without pedagogical instruction could turn this dynamic instructional tool into a significant course obstacle. While frustrating for the faculty member, this is especially dangerous to at-risk nontraditional students such as adult learners whose motivation can be damaged as a result of this disconnect in the classroom.

There are many aspects of curriculum design and instruction where classroom interaction and student motivational factors can and should be taken into consideration; "the promise of technology has generated a new vision – that of intelligent personalized learning environments that facilitate real-time dynamic mapping and sequencing of instruction to individual learner characteristics" (Coffin Murray & Perez, 2015).

The design of an online course offers the opportunity for students and faculty to interact in many ways (See Figure 2). In an online classroom, students have the opportunity to interact with both faculty and peers using synchronous and asynchronous methods such as discussion boards or interactive live sessions. In addition, students are able to apply and demonstrate their knowledge and learning through the course assignments. Adaptive learning technology, then, is an additional component of the online classroom where students have the opportunity to interact through not only the learning activities and communication tools, but also through an understanding of the resulting data. This data from both student and faculty perspective is an important element of using adaptive learning technology that is not present in the traditional classroom environment. As a result, both students and faculty should be well versed in finding, analyzing, and responding to the data in order to effectively use the technology as a teaching and learning tool.

**FIGURE 2**
**ADAPTIVE LEARNING COURSE**



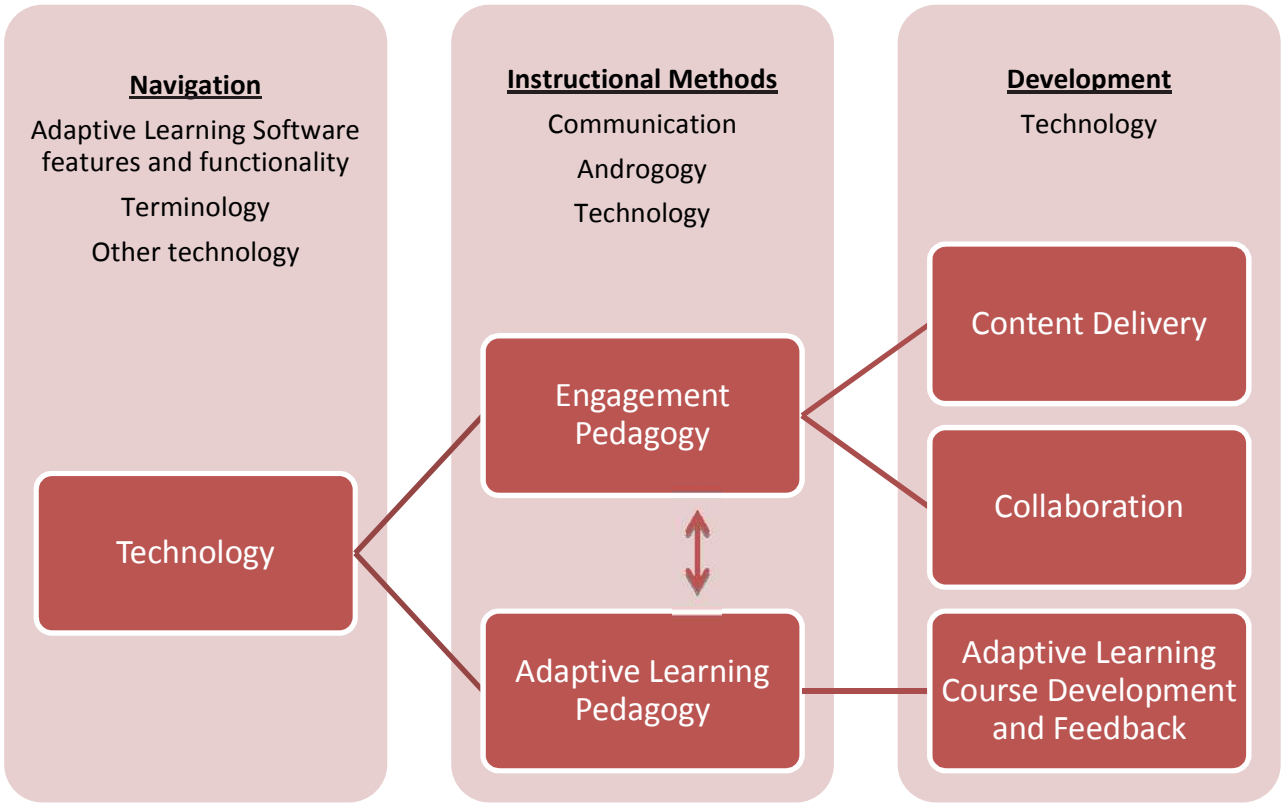

What becomes crucial then is preparing faculty to engage with students through these dynamic technologies and to connect it with other areas of the classroom. In this sense, adaptive learning is an example of what Johnson, et al. (2013) identified as a trend in education where "we are fostering more personalized collaboration among students and with instructors by virtue of new tools and new data that promise to bring the power of learning to more learners more effectively and more efficiently than ever before" (p. 16). Thus, based on the needs of the student population, and with Adult Learning principles as the foundation, there are several components that faculty training and development must consider in order to prepare faculty members to use adaptive learning technology an effective pedagogical tool.

Initial faculty development models based on pedagogy created tiered and segregated training so that faculty members could have unique focus. Universities, such as Colorado Technical University, layered faculty development and attempted to create training in small digestible modules. Primary trainings maintained focus on the base use of the software and course technologies. Secondary training then would present pedagogical strategies for distance learning and modules about the andragogy of adult learners. These disparate trainings often answered the 'who', 'what', and 'why' of effective instruction without addressing the 'when' and 'how' of engaging facilitation. Often faculty members found themselves

learning by doing and while teaching is a vocation by which experience is the true development, faculty members could have been better prepared through an integrated training approach of theory and application. Adaptive learning as a technology is a limited tool and it is the interaction of instruction that gives the educational boost to this component.

Training and development in adaptive learning should incorporate the concept of adaptation within content, navigation, instructional methods, and development (See Figure 3), to integrate the technology within every element of the instructional environment.

**FIGURE 3**
**ADAPTIVE LEARNING FACULTY TRAINING AND DEVELOPMENT MODEL**




When training faculty on navigation, they should be familiar with the terminology used in the features and functionality of the classroom as well as the adaptive learning technology. Not only should they feel comfortable using the technology, but also they should be able to help students with the technology. The more confident faculty are with the technology, the more they are able to make students feel comfortable using it. While navigating and using the functions of the technology itself is hugely important, helping faculty understand how to facilitate and utilize the technology is also crucial for the classroom to successfully meet student needs.

Faculty training and development should prepare faculty to engage with students using the technology and must focus on instructional methods. A key component in faculty training related to instructional methods, then, is encouraging students to use the technology as a tool for reflective and self-directed learning. The technology itself provides immediate assessment, which contributes to constant feedback of performance and allows the student to engage in areas of strength as well as identify areas in need of improvement. Yet, this requires both the faculty and student to engage with the technology and with each other. Instructor pedagogy also supports open-ended conversations, allowing students to reflect on their own progress and engage in assessing needs. Thus, training and development should focus on helping

instructors understand how to use the principles of adult learning to connect adaptive learning technology to their engagement with students as an integral part of their instructional approach.

A final area of the proposed faculty development model for adaptive learning technologies is to provide development for faculty to understand how to effectively integrate the adaptive learning technology into their instructional methods. With the adaptive learning system designed to provide content delivery and knowledge of the information, the instructor can focus on concept building and application through interactive synchronous chat sessions, for example. One challenge stems from the regular use of adjunct faculty and/or inexperienced and untrained faculty teaching adult learners. Faculty should have multiple opportunities to collaborate with others to share ideas and best practices. In addition, faculty should have a basic understanding of how courses are developed and have the opportunity to provide input into that process. The more faculty are involved in the process of development, feedback, and collaboration, the more confident they will feel in using adaptive learning effectively in their instructional approaches.

Adaptive learning technologies differ in their approach to adaptation including content, navigation, and assessment (Brusilovsky & Maybury, 2002; Inan, Flores, & Grant, 2010) and these technologies have shown promise. Adaptive learning helps students to hone in on those areas of greatest need without having to repeatedly demonstrate mastery of areas where knowledge and understanding are already strong. The knowledge gap affects students who are not able to identify the key ideas and basic concepts that support the course outcomes.

Adaptive learning also has the potential to significantly aid in maintaining student motivation, and motivation is, as Miller (2011) states, "a very powerful tool in the hands of a skilled instructor and a dedicated student. It is that intangible quality, a core resource that drives a student to accomplish the things that must be done" (p.44). Coffin, Murray, and Perez (2015) warned that while adaptive learning in and of itself may have a positive impact on student persistence and engagement, they also feel that "pedagogy, rather than technology, must drive the evolution of advanced learning systems." Adaptive learning technology should maintain the instructor as an integral part of that system that provides additional opportunities for adaptation to both student motivation and skill levels beyond that offered solely through the software. In this way, adaptive learning can serve to amplify whatever adaptation to the student the instructor alone would typically have provided in a traditional, non-adaptive learning version of the course.

Yet, when it comes to instructors successfully using technology as an effective pedagogical tool in the classroom, "researchers have identified numerous culprits, including teachers' beliefs about what constitutes effective instruction, their lack of technology expertise, [and] erratic training and support from administrators," (Herold & Smith, 2015). According to the principles of andragogy then, faculty training and development must focus on training instructors on pedagogical methods to interact with students through both the adaptive learning technology and other more traditional classroom structures, such as feedback and discussion boards, in a way that seamlessly connects these areas to student learning needs and motivations.

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