

## **Effective Implementation of Technology to Personalize Learning: Preparing Students to Thrive in a Global Society**

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*A Nation at Risk*, published more than thirty years ago, provided a stark and alarming call to action: the American education system must be reformed if we are to compete in a global economy. Specific concerns included that schools place too much emphasis on basic skills at the expense of higher-level thinking and problem solving. The report argued that the goal of education must be to develop our students' talents to the fullest and to extend learning opportunities outside the walls of the school into their homes and communities. It challenged policy makers and educators to develop an educational system that leveraged the talents and interests of each student and fostered life-long learners (National Commission on Excellence in Education, 1983).

Fast forward to 2015 and the call for educational reform has not been quelled. However, many politicians and educators have narrowed in on what that reform should look like: personalized learning (Culatta, 2012; Hanover Research, 2014; Kratsch, 2014; Patrick, Kennedy, & Powell, 2013; "Teaching our teachers," 2014). *The National Education Technology Plan* (U.S. Department of Education, 2010) defines personalized learning as learning that is "paced to student needs, tailored to learning preferences, and customized to the specific interests of different learners" (p. 12). In contrast to traditional classroom instruction, personalized learning puts students at the center of their learning and empowers them to take ownership of what they learn, how they learn it, and how they demonstrate content mastery (U.S. Department of Education, 2010).

Achieving the goal of personalized learning requires a change in pedagogy from a traditional teacher-centered approach to one that puts students at the center of their learning. To accomplish this on a large scale, teachers need to rely on technology as it affords teachers the time and flexibility required to effectively personalize learning for students (Hanover Research, 2014). Further, districts should work toward providing students with individual devices as opposed to relying on outdated computer labs (Culatta, 2012). When students have their own devices, students have flexibility in how, what, when and where they learn. Ultimately, student engagement and motivation to learn increases through participation in learning experiences that are relevant to

the student's life, interests and goals (Hanover Research, 2014).

The traditional teaching model present in most schools across the nation treats all learners the same despite the unique strengths, interests, and needs each learner brings to the classroom (Culatta, 2012). United States Secretary of Education, Arne Duncan, challenged educators to "take classroom learning beyond a one-size-fits all mentality and bring it fully into the 21<sup>st</sup> Century" (as cited in Culatta, 2012, p. 3). To compete in this global economy, American educators cannot continue to hold fast to traditional methods of teaching and learning. Instead, it is prudent to leverage the technology available. Providing students with personal devices, and teachers with robust professional development that enables them to effectively integrate technology into instructional practices to personalize learning for students, will allow schools to activate learning by connecting it to student interests, diagnose and address student needs, place a greater emphasis on higher order thinking. Adopting this new pedagogy will lead to the development of lifelong learners who are well prepared to navigate an ever-changing world.

### **Personalized Learning**

#### **Defining Personalized Learning**

To compete in this global economy, U.S. schools must find ways to increase student success in school. Through a meta-analysis of twenty-one studies on the effectiveness of tutoring on student achievement, Ritter, Barnett, Denny and Albin (2009) confirmed the power of one-to-one tutoring. Yet, it is impractical to suggest that schools provide one teacher for every student. One promising approach, however, is to increase the teacher's ability to personalize learning for students. When personalizing learning, schools empower students to take ownership of their learning. Student learning experiences are tailored to individuals by emphasizing student interests, skills, and needs. Instructional methods employed include small group and individual instructional time with teachers, collaborative group projects, and the strategic use of technology (Childress & Benson, 2014).

Personalized learning may involve changing the pace of instruction (slowing down or accelerating, based on student need), adjusting the instructional approach, and/or leveraging student interests/experiences. The frequent use of formative assessments allows teachers to understand immediate needs of students so that instruction can be adjusted in the moment (Culatta, 2012). Teachers of learner-centered classrooms use a variety of techniques to assess students and support students in self-evaluation (An & Reigeluth, 2011).

The teacher's role in learner-centered classrooms is one of facilitator as opposed to the traditional model as the gatekeeper and transmitter of knowledge. Instead, they shift control of learning to the students themselves while guiding them in developing an awareness of how they learn so that they can be equipped to apply those skills in a variety of settings (An & Reigeluth, 2011).

### **Benefits of Personalized Learning**

Teachers are charged with the responsibility of ensuring the academic success of every student. High stakes testing mandates evaluate district success according to the pass rates of students of all learning styles and abilities; each is expected to gain the knowledge and skills required to graduate from high school and become contributing members of society as they enter college and careers. The practice of teaching to the middle has proven ineffective in accomplishing this goal. Finding ways to make learning rigorous, relevant and meaningful for each learner, or personalizing learning for each student, offers a promising solution (Grant & Basye, 2014). Personalizing learning increases student engagement and motivation. When engagement and motivation are increased, achievement follows (Chase, Hilliard, Geldhof, Warren, & Lerner, 2014).

When students take control of their own learning, they take responsibility for outcomes and take ownership of consequences that result from their choices. Such learning has implications that reach well beyond the school setting, preparing students with the skills they need to explore their passions and achieve their dreams (An & Reigeluth, 2011). Quite simply, when teachers personalize learning, they are more likely to meet student needs and keep them engaged as learners. Learners engaged in meaningful learning at the right level of challenge are more likely to be successful and meet established educational outcomes (Grant & Basye, 2014).

### **Role of Technology in Personalized Learning**

The idea of personalizing learning is not new. In 2009, Hartley (as cited in Prain et al., 2012) argued that this notion is simply a nod to the child-centered education movement of the 1960s. This movement resulted in little, if any, pedagogical or curricular change in the last fifty years. Further, this notion of personalization flies in the face of the move towards required implementation of State and Federal controlled standards where the content, pace and control of the curriculum does not lie with schools or teachers, never mind students. Highly prescriptive, teacher proof curricula, the antithesis of student choice, fill classrooms (Campbell, Robinson, Neelands, Hewston, & Mazzoli, 2007). With that historical perspective and current reality in mind, one may think that this is simply continuing a discussion that will ultimately lead nowhere.

Yet, there is a considerable difference in the tools available to teachers and students in 2015 that were not present even in 2009 when Hartley made that statement. Those tools come in the form of technological advancements in both hardware and software. So while technology is not a requirement in personalizing learning, it is considered to be an essential tool in bringing the goal of personalized learning to scale.

Personal devices such as tablets and laptop computers have opened the door to learning anytime, anywhere (Greaves, 2000; Kong, et al., 2014; Storz & Hoffman, 2012). Technology can be used to allow for flexible pacing and to design learning experiences that reflect the needs and interests of each student. Technology-based assessment systems provide immediate feedback regarding student progress. This data can be used to respond to the needs of students in the moment so that each student will be challenged at the appropriate level (Grant & Basye, 2014).

A quarter of the students responding to the 2014 Speak Up survey indicated that they are learning in a blended environment, meaning they are receiving instruction by a teacher and via technology. Those students cited the advantages of such a learning environment include that it allows them to work at a pace that is right for them, it helps them develop creativity skills, and it increased their opportunities to collaborate with peers both inside and outside of school (Devaney, 2015). This data suggests that the integration of technology is allowing schools to better reach the 21<sup>st</sup> century learning goals largely accepted as necessary in enabling our students to compete globally.

## **Pedagogical Shifts Required**

### **Instructional Practices to Support Personalized Learning**

Classrooms that support personalized learning are anchored in a philosophical approach that places the student at the center of the learning as opposed to the traditional approach of placing the curriculum in the center. The needs of the students come first and therefore teachers provide flexibility in how, what, when and where students learn (Hanover Research, 2014). Learning expands outside the school walls and beyond the closing bell (Campbell et al., 2007).

Opponents of the use of technology in the classroom worry that students will lose the opportunity to build social skills critical for thriving in society. Personalized learning environments are social learning environments that bring teachers together to support the learning of all students. Learners in personalized learning classrooms feel accepted, supported and welcomed (An & Reigeluth, 2011). Strong relationships are built among teachers, students, parents and the community. Teachers work in teams to support students (Hanover Research, 2014).

Instructional approaches present in a personalized learning classroom include project based, authentic learning opportunities. Learning is made relevant and meaningful to each learner (Hanover Research, 2014). Students are pushed to think at higher levels, apply learning to real life situations, and engage in collaborative problem solving (An & Reigeluth, 2011).

Teachers activate learning in their students and adapt instruction in response to frequent assessment. They provide real time feedback to students and their parents. With teacher guidance, students take ownership of their data and begin to increase their self-awareness of their strengths, weaknesses, achievements, and opportunities for growth and improvement. Teachers allow students to demonstrate their learning in a variety of ways, honoring creativity and divergent thinking (Hanover Research, 2014).

### **Professional Learning Critical to Promote Shift**

Teachers cannot be expected to shift pedagogy without support in understanding why there is a need for

change, what that change looks like, and how they can get there. Senge (1990) maintains that successful reform depends on what happens within the smallest unit of the organization. For schools, that unit is the teacher who is charged with bringing policies and practices to life in the classroom. Districts that actively engaged teachers reform efforts, offered high quality professional development, and provided sufficient resources to support the initiative had the greatest successes in making the transformation to a culture of personalized learning (Hanover Research, 2014). Pan and Franklin (2011) found that professional development and administrator support were key elements in making progress with change initiatives. With regard to technology integration, they concluded that the more teachers engaged in professional learning, the more they leveraged technology in their classrooms and the more confident they became in the use of technology (Pan & Franklin, 2011).

Patnoudes (2014), a former teacher and instructional technologist, acknowledged the pendulum effect common in educational reform. Teachers often try to outwait what is perceived to be the latest fad. However, Patnoudes argues, if teachers are given the *why* of the reform effort combined with relevant, job-embedded professional learning, they are more likely to embrace the change. In helping teachers effectively integrate technology into instruction, he stresses that “pedagogy is the driver and technology the accelerator — or else it will simply end up being the brake” (p. last paragraph). Because personalized learning is not focused solely on technology integration but rather all instructional practices that put the student at the center of the learning, teachers must first develop proficiency in creating effective problem-based learning opportunities and collaborative projects (Oliver, 2010). Best practices in technology integration begin with teachers identifying what they want to teach, with a focus on student voice, choice, and higher level thinking skills, and then deciding how (and if) technology will add value.

Past successes of districts engaged in making this pedagogical shift inform best practices. Teachers benefit from establishing networks of colleagues where they can share ideas in job-alike groups. They thrive in collaborative environments where the learning opportunities are relevant to individual teacher needs and learning structures are embedded in their daily work (Oliver, 2010; Starkey et al., 2014). Teachers make the greatest progress when they are given the freedom to choose their own learning objectives and to engage in

active learning opportunities and collaborate with their peers (Stewart, 2014).

### **Educational Leaders' Role in Supporting Change**

Most schools are organized around the work of adults as opposed to the work of students. The school leader's job is to enable teachers to shift their role to one that gets "students to do something, not to do something to students" (Cole & Schlechty, 1993, p. 2). Teachers must be empowered to lead innovative practices that respond to the needs of the students in their classrooms and school community. Leaders must provide teachers with the opportunity and encouragement to build a learning community focused on providing high quality learning experiences for students and ensuring teachers and students have the supportive conditions they need to engage in continuous growth and development (Cole & Schlechty, 1993). To accomplish this, educational leaders may need to consider supporting changes in policy with regard to pacing, grading, and scheduling (Pipkin, 2015).

Pedagogical change is a prerequisite to effective integration of technology into instruction; integrating technology into a teacher-centered classroom does little to shift the focus of learning to one that requires high level thinking where students create rather than consume content. Yet, while we know that "pedagogy needs to drive technology" (Fullan, 2011, p. 5), it is also true that many teachers do not have the knowledge, skills or level of comfort needed to use technology in meaningful ways (Machado & Chung, 2015).

The attitude of the principal towards the benefits of integrating technology has been demonstrated to have a significant effect of teachers' effort and commitment towards learning to use technology as a tool to support student learning. Teachers' attitudes and perceived computer self-efficacy strongly predicts how much effort a teacher will put towards learning effective ways to integrate technology. They tend to be more interested in time saving approaches, which are very teacher-centered, as opposed to creating a learning environment that requires student voice and choice. The antidote to that challenge is for principals to provide ample time for teachers to explore the resources available to support learning for students (Machado & Chung, 2015).

### **Measuring Progress**

#### **Measuring the Effectiveness of Technology Integration Within a Culture of Personalized Learning**

The development of a personalized learning environment in a classroom requires a shift of pedagogy combined with the effective integration of technology. Assessing progress towards achieving this goal requires measuring multiple areas from the most basic level of assessing the availability of technological devices, to the content, quality and impact of professional learning offered, to the effectiveness of the teaching practices including the integration of technology in the classroom setting.

The availability of technology itself is necessary but not sufficient to ensure effective technology integration for personalized instruction. Districts must ensure that students and teachers have access to the technology devices needed or this change cannot occur. Yet there is a need for targeted professional development that helps teachers overcome some of the difficulties typically experienced by teachers working to implement personalized learning. Those challenges include a lack of time to analyze students' needs and to plan for addressing them through instruction, access to experts who can provide support, and the knowledge and skills required to address students' diverse needs (Lin & Kim, 2013). Measuring teachers' access to the working conditions and resources needed to support this change provides insights into the success of the change process.

Moving to a pedagogy that embraces personalized learning represents a significant change in practice for the majority of teachers, with or without the integration of technology. Placing students at the center of instruction, giving them ownership, voice and choice in their learning, and taking on the role of facilitator or activator of students' learning often runs counter to their own schooling experiences and their professional training. To support a fundamental change in practice, professional development must play a major role (Starkey et al., 2009). Measuring the quality of content and implementation of the professional learning as well as the transfer of best practices into the classroom is critical to understanding the transition to a personalized learning culture.

It is often believed that the effectiveness of professional development can be assessed by looking at student achievement. While it seems intuitive that effective professional development would lead to increased student achievement, demonstrating that connection is challenging. The theory of action that supports the connection can be described in three steps: (1) Professional development enables teachers to increase their knowledge and skills; (2) That improved

knowledge and skills will improve classroom teaching, and; (3) Higher quality teaching will lead to increased student achievement (Yoon, et al., 2007).

For that theory to become reality, however, the quality of the professional development must be considered. Quality of content and implementation directly impacts outcomes and much research has been devoted to identifying the critical components of such learning. Still, significant research requirements are needed to establish an “empirical link between professional development and student achievement” and as a result “few rigorous studies address the effect of professional development on student achievement” (Yoon, et al., 2007, pp. 4-5).

With that in mind, it will better serve districts to measure the quality of the professional learning sessions and how the knowledge and skills learned are put into practice. Professional literature reveals promising professional development practices that are considered to be more effective than traditional, more passive delivery models (Stewart, 2014). In addition, professional learning models have been specifically designed to support teachers in personalizing instruction and the integrating technology. Successful models have found that the teacher professional development should include five components: (1) align with individual teacher needs, (2) include opportunities to collaborate with peers and experts (3) offer on-going school based support, (4) employ reflective and inquiry-based approaches, and (5) scaffold instruction to respond to individual teacher needs (Lin & Kim, 2013).

Numerous more specific frameworks have been developed to measure technology integration. Davies (2011) offers a “framework for understanding technological literacy” (p. 45) that involves three levels: Learners must (1) become aware of the technology available and how it can be used, (2) practice using various technologies/applications, and (3) develop effective uses that include an awareness of how and why the technology adds value (Davies, 2011).

Vaughn (2012) conducted a study to evaluate the use of the International Society for Technology in Education’s Classroom Observation Tool (ICOT) to determine the effectiveness of technology integration in an elementary classroom. The ICOT “allows the classroom observer to collect data on classroom groupings, teacher roles, time devoted to technology use, and the various forms of technology used” (Vaughn, 2012, p. 58). Vaughn (2012) found the tool effectively measures what it is designed to measure, however

questioned if that is the right data to determine if technology is being used effectively to improve student achievement.

Another recommended approach is action research. Dawson (2012) and Ham (2010) examined how action research can provide insights into how teachers use technology in their classroom including the lesson goals, content, the hardware and software used, and whether the intended outcomes were achieved. They concluded that the reflective and collaborative nature of action research provided benefits to both the teachers themselves and the researchers. Ham (2010) acknowledged that downsides to this approach include that the research may not focus on all stakeholder perspectives and the logistical challenges of being “both actor and researcher at the same time” (p. 28).

Two other models, Technological Pedagogical Content Knowledge (TPACK) and Substitution, Augmentation, Modification, Redefinition (SAMR), have risen to the top as having particular promise in assessing the efficacy of technology integration into instruction. TPACK provides a frame for teachers to consider the relevant and effective use of integrating technology into learning while SAMR offers a framework to assess the quality and potential impact of the task itself with regard to rigor and higher level thinking (Kirkland, 2014). While the SAMR framework is a valuable tool in evaluating instruction that integrates technology, Romrell, Kidder and Wood (2014) caution that it remains very subjective. They recommend that SAMR be used in conjunction with the goals of personalized learning, or what they call “mLearning” which is defined as “learning that is personalized, situated, and connected through the use of a mobile device” (p. 2). By “situated,” they are referring to the mobile nature of the devices, the anytime, anywhere access to information, and the opportunity to place learning in real-world settings, relevant to the individual learner; “connected” refers to instant connectivity with information and people (Romrell et al., 2014).

### **Implications for Research and Practice**

Schools have struggled to cope with the changes that have occurred in society for hundreds of years but most especially since the latter half of the 20<sup>th</sup> century (Mitra, 2014). With the rapid changes in our world, educators can no longer remain entrenched in past practices. Students need teachers who will embrace the latest research and innovations to inspire, motivate and engage them in the kind of learning that will prepare them for an unknown and ever-changing future. We need

students who can collaborate, communicate, think critically, create and innovate (NEA, n.d.; Tucker, 2014).

Changing practices does not come easily. Teachers need tremendous support from school administrators to understand what changes are needed and how those changes will benefit children. They also need explicit instruction and ongoing embedded support to enable them to shift from running a teacher-centered classroom to a student-centered classroom and how technology can best be leveraged to support that transition.

Educational reform in recent years has been in the form of accountability and a tendency toward greater standardization and less teacher autonomy. Such policies often discourage the kind of reform that is needed to bring about personalized learning. More research into the types of school districts that have successfully made this transformation and the process they used to get there will support others in finding their way towards meeting this goal. Further, research that looks at the results of use of integrating technology into instruction with regard to increased student motivation, attendance, connection to school and learning, and ultimately academic achievement would help encourage more school administrators and teachers to invest the time and money it will take to make this important pedagogical shift.

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