Chapter #6

FLIPPED CLASSROOMS, FLIPPED HOMES? TENDING TO STUDENTS' PERSONAL COMPETENCIES

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ABSTRACT
Sharply increased workforce demands for computer skills are due to the significant effects that technology and media use have had on several aspects of daily life. These changes have prompted shifts in pedagogical thought, a push for change in classroom practices, and an urgent need for tending to the learning needs of students in an ever-changing global landscape. In the era of personalized learning, technology use is indispensable to enhance the individualization and differentiation of learning, and serves as the pillar of competency-based education. The swift pace of change, however, has raised concerns and reluctance from practitioners and other stakeholders. As with any and every innovation, its use is as good as its users. Educators who are utilizing technology and media advances in a targeted and purposeful way can enhance student learning by putting an emphasis on the four personal competencies of the learner (cognitive, metacognitive, motivational, and social/emotional). The present paper explores ways students' personal competencies can be addressed within a flipped-classroom model, and the ramifications that such a model shift has on parent involvement and school-family interactions. The flipped classroom framework is discussed as a context in which media integration can foster competence-based, personalized education.

Keywords: student competencies, flipped classrooms, technology integration, parent involvement, home-school interactions.

1. INTRODUCTION

Technology and media have dominated daily lives having a profound impact on all aspects of parent-child, home-school, and student-teacher interactions (Patrikakou, 2015, 2016). The brisk pace of technology and media saturation has introduced a new variable that plays a progressively critical role in understanding child-parent-teacher relationships. The Pew Research Center (Perrin & Duggan, 2015) reports that in the U.S. 97% of teenagers ages 12-17 and 96% of 18-29 year olds have internet access. OECD (2015) data indicate that over the past decade, percentages have increased sharply internationally, as well. For example, in 2015 percentage of households with internet access via a personal computer within the European Union ranged from 68.1 (Greece) to 96.8 (Luxembourg), up from 21.7% and 64.6% respectively in 2005. With declining cost and easy access to cell phones and other hand-held devices, percentages to internet access can be even higher.

2. SCHOOL-RELATED TECHNOLOGY USE AND STUDENTS' PERSONAL COMPETENCIES

Called this generation's "Sputnik moment," access to technology and the internet are deemed essential for countries to maintain or gain leadership among industrialized nations (Kohlenberger, 2007). This global technological leap has changed the way that families

conduct their daily lives, connect with the community, and enhance their children's learning opportunities. Consequently, formal schooling in all levels of the educational ladder has been shifting. Especially, in the era of personalized learning, technology use to enhance the individualization and differentiation aspects of learning is indispensable, and serves as the pillar of competency-based education.

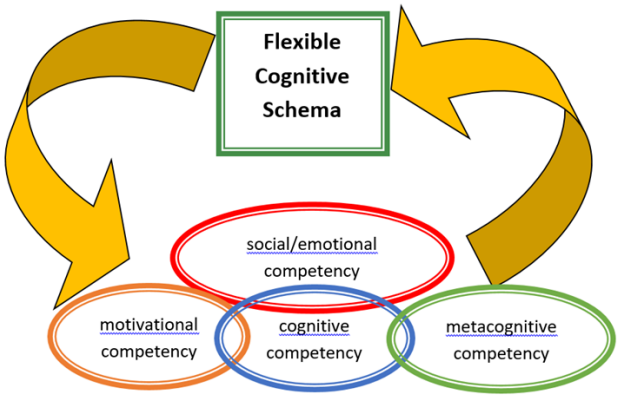
Competence-based education extends beyond knowledge-transfer, and requires the learner to demonstrate targeted content and skills. This approach culminates into a higher order of learning that is assessed by a comprehensive student evaluation. Such an evaluation is embedded throughout the educational process not only as a measure of learning objectives, but also as a meaningful assessment to directly inform practice (Twyman, 2014). Extensive technology and media integration in the classroom creates the unique opportunity of making competence-based, personalized education a reality.

In order for learners to keep up with the brisk changes in accessing resources, they need to have a flexible cognitive schema (Patrikakou, 2015). This cognitive flexibility allows learners to quickly adjust their thinking and adapt to technological advances and their applications. A flexible cognitive schema is supported by fluid reasoning - the capacity to think logically and solve problems in novel situations, and relates to fluid intelligence, reading fluency and reading comprehension (Cattell, 1987). In the context of rapid technological advances, cognitive processes, which are part of learners' personal competencies, assume an even more pronounced role: learners without a flexible cognitive schema will struggle to keep up with new advances and, therefore, with accessing and processing information and developing novel skills.

A way to foster a cognitive flexible schema is by placing an emphasis on personal competencies as a framework to build the students' capacity to learn. In proposing such a framework, Redding (2014) makes the important distinction between "competence" and "competency". The former reflecting a certain degree of knowledge required to be functional in any given area, whereas the latter term denoting not a set capability, but a conglomerate of factors facilitating life-long learning. An essential part of the personal competency framework is the four personal competencies of the learner (Redding, 2014):

- **Cognitive competency** consisting of prior learning, associations to new concepts, and facilitating new learning.
- **Metacognitive competency** including self-appraisal and self-regulation (task analysis & goal setting, implementation, incorporating feedback, adapting or modifying). Aspects of the metacognitive competency are also part of the social and emotional competency.
- **Motivational competency** triggered by teachers' extrinsic incentives, and leading to the student's intrinsic motivation for exploration, discovery, and mastery.
- **Social/emotional competency** involving self-awareness, social awareness, self-management, responsible decision-making, and relationship skills (see Figure 1 for a pictorial depiction of competency and flexible cognitive schema inter-relationship).

Figure 1.
Flexible cognitive schema and personal competencies.



Technology allows for limitless possibilities for enhancing personal competencies. In order to best guide and support differentiated student learning in this fast-changing era, schools around the U.S. have begun to adopt a paper-free approach to learning, doing away with books and notebooks. Students are provided with (or bring to school their own) laptops or tablets which they ferry to and from school. Would this further widen the access-to-education gap among different socioeconomic strata?

Recent studies and articles on the matter indicate that spending on America's schools has more than doubled over the past forty years, with the majority of spending going to textbooks and desktop updates with little impact. Hand-held devices such as tablets and ipads set up with appropriate software that addresses the Common Core Standards, seem a much better allocation of funds to maximize the benefits of educational spending, and also offer more personalized educational experiences to all students and not just those who have better access to resources at home (Technology in classrooms, 2014).

In the sections that follow, a discussion is presented on ways through which technology can be meaningfully integrated into instruction and homework. The flipped classroom framework and its impact on the four aforementioned personal competencies are discussed as a broader context in which media integration in the classroom can foster competence-base, personalized education.

3. FLIPPED CLASSROOMS: A NEW CONCEPT IN EDUCATION?

There is no single definition for flipped classrooms. What lies in the core of this approach is assigning student instructional content prior to coming to class, so that in-class time can be spent working on applications instead of lecturing (DeLozier & Rhodes, 2017). The term "flipped learning' is also used to describe a broader pedagogical approach along the same lines. Both terms point to a student-centered approach with a dynamic interaction between the instructor and the learner, where student needs are tended to in a more targeted and personalized way.

Teachers have always required students to complete readings and come prepared to class, not only for concepts already introduced in class, but also for forthcoming events, facts, readings, and concepts. Therefore, aspects of the flipped classroom are not novel. Other parts may seem a departure of the traditional classroom approach, such as spending

face-to-face time primarily not for lecturing, but for guiding and assisting students through mastering and applying concepts, thereby increasing the value of classroom face-to-face time. Benefits of this approach include, more personalized learning as students move at their own pace; more efficient use of classroom time; better insight of learning styles and issues through monitoring in-class student work; and, higher levels of student engagement with the content (Fulton, 2012a)

Contrary to general belief, the emphasis of such a model is not on the technology use per se, but on the pedagogy behind it, as the flipped classroom model is not just a tech-centered, spin-off of an old approach, but rather a student-centered approach. The misperception may be stemming from the fact that teachers in a flipped classroom often need to create short instructional videos that students can watch at home in addition to any assigned readings. This prospect of media development and integration can make teachers wary of yet more requirements to which they would have to tend. However, as Bergmann and Sams (2013) note, flipped classrooms are "not about how to use videos in your lessons. It's about how to best use your in-class time with students" (p.16). This also includes providing feedback faster, and involving students more meaningfully in mastery monitoring, and in more interactive and individualized assignments (Gullen & Zimmerman, 2013). After all, with access to open resources on the web, many such instructional media supports are publicly accessible, and teachers can utilize them without having to reinvent the wheel. As President Obama has stated in discussing the tech push in US schools: "Technology is not a silver bullet; it's only as good as the teachers who are there" (Holland, 2014).

3.1. Aspects of flipped classrooms and personal competencies

A starting point for educators is to examine which courses are best suited for the flipped classroom model or a technology-enriched classroom – not all are equally well suited for such a framework. Next, it needs to be decided what aspects can be removed from in-class time and be reviewed and completed by students prior to coming to class with the use of technology. This offers opportunities to review prior knowledge and encourage connections to new topics, both integral parts of the cognitive competency. It also challenges students to familiarize themselves with terminology, facts, and ideas as they prepare for in-class analysis, discussion, application, and problem-solving. Such a feature also tends to the motivational competency by stimulating intrinsic motivation and capitalizing on children's inquisitiveness, and inspiring exploration and discovery. Having students watch video lectures and other media can also enhance student engagement and increase learning, since it provides students with the element of self-pacing. In this way, students who are able to accelerate through material, they will be enabled to do so, whereas students who may need to view material multiple times, could do so as well (Goodwin & Miller, 2013). In addition, within the flipped classroom mode of instruction, students can more effectively monitor their personal learning process, reflect on, and evaluate it leading to increased self-regulation (Lai & Hwang, 2016), an essential part of the metacognitive competency.

During class time, teachers can check, reinforce, and differentiate instruction to best address student needs. Spending more time interacting with students also offers the opportunity to better understand their reasoning, what they are learning, and to clarify points along the process, as needed (Moore, Gillett, & Steele, 2014). Providing real-time feedback is crucial to correcting student misperceptions as soon as possible, and, therefore, improve learning (Goodwin & Miller, 2013). This emphasis on processes is essential for cognitive and metacognitive competencies, and it is fostered in the classroom by teachers

providing direct feedback, assisting students with planning, analyzing, and problem solving, instead of students completing homework in isolation. The combination of flipped homework and in-class work also nurtures intrinsic motivation as students assume more responsibility for their own learning and, therefore, derive more satisfaction from their mastery and achievement. In addition, by having students monitor their own learning, self-awareness (a component of both metacognitive and social/emotional competencies) is also enhanced and contributes to self-management and responsible decision-making. Consequently, teachers can demonstrate the benefits and support the development of a flexible cognitive schema that is essential to keeping up not only with curricular demands, but also with the fast pace of an ever-evolving tech-based world.

Evaluation also assumes a different role as students are assessed along the way, ensuring that students master curricular components before they move to the next one. Along these lines, differentiated instruction and project-based learning are highly compatible with the flipped classroom framework, and provide teachers with the opportunity of better integrating such aspects in their practice. Within a flipped classroom, teachers can engage in formative evaluation to monitor student learning, provide targeted feedback, intervene early, and inform their instructional practice in more direct ways than in a traditional classroom. For example, it is easier to assist students in identifying areas of strengths, as well as growth, and guide them to improve on weak areas during class time that would have otherwise been spent on lecturing or knowledge transmission. Through basic activities of drawing concept maps, but also higher-order activities of applying concepts and problem solving, either in groups or individually, teachers can obtain a good idea of student learning and progress, and intervene early as needed. It is important to note that this formative evaluation process is also encompassed in Multi-Tiered System of Supports (MTSS; also known as Response to Intervention) which are being adopted by an increasing number of states and school districts in the US. Teachers with flipped classrooms can also fulfill MTSS requirements through their classroom routine, instead of treating such requirements as an add-on. The flipped classroom framework offers an organizational basis that can actually cut down time for monitoring and record-keeping, since both of these components are inherent in a technology- and media-enhanced framework. Allowing for such formative evaluation process also decreases the probability of unfortunate surprises in summative evaluations, sometimes occurring in high-stakes assessments, when teachers struggle to understand why students did not perform as expected on a test, despite all efforts.

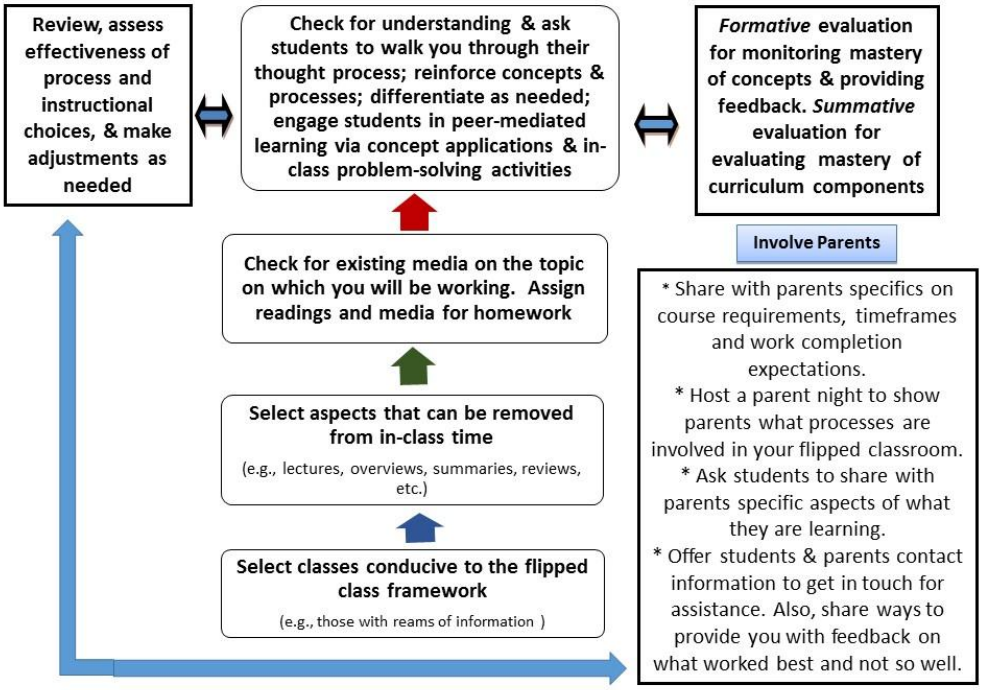
Summative evaluations can also be individualized, therefore closely addressing students' personal competencies and better assessing mastery levels. As Bergmann and Sams (2013) suggest, setting clear, discrete learning objectives, and creating a test bank with several items for each learning objective will enable instructors to develop exams that will differ for each student but that will test the same learning objectives. Lastly, instructional decisions are made based on an ongoing, real-time data collection. Therefore, time between data collection and informing classroom practice is minimized to best fit student learning and create a tighter association between desirable behaviors and instruction.

Moving from a knowledge-transfer model, also has implications for homework. The nature of homework changes as students have many more opportunities to engage in problem-solving and in-class applications with teacher guidance and assistance. Since the focus of competence-based, personalized education is on the learner, being able to demonstrate content understanding and skills proficiency in class, instead of completing a traditional-type of homework, allows for close monitoring, immediate intervention as

needed, and direct demonstration of mastery. Another important aspect is that homework completion and student engagement increase in flipped classrooms, even in subject-matters such as math, which may alienate some students (Moore, Gillett, & Steele, 2014). This finding is an indication of increased motivational competency, with students pursuing discovery and mastery as a reward. In addition, flipped and technology-enhanced classrooms allow for peer-mediated instruction, where students work together on problem-solving tasks, learning from each other in the process, which has been shown to be an extremely effective instructional tool to increase the academic, social, and emotional competencies of all students (Hall & Stegila, 2003; Bell & Carter, 2013). In addition, through these activities, social/emotional competencies can be practiced and monitored by teachers who can mentor students to successfully navigate teamwork by setting clear roles, responsibilities and expectations, as well as modeling, and re-directing. This integration of social and emotional competencies and dispositions is another important aspect of competence-based education, as achievement in school and in life does not only require academics, but also development of intrapersonal and interpersonal skills (Weissberg & Cascarino, 2013).

By and large, the flipped classroom model requires a shift from traditional, teacher-centered instruction to student-centered instruction. Such a framework requires re-examining and changing the role of educators, and calls for a significant shift of pedagogical paradigms. This shift does not diminish the role of educators; on the contrary, it provides teachers with the power to really exercise pedagogy (παιδαγωγία) in its inquiry-based, Socratic approach to learning, paradoxically returning to the root of Ancient Greek *paideia* via the use of technology. After using lecturing for years as the main means of instruction, Eric Mazur, a physics professor at Harvard, realized that his students could not engage in problem-solving that he thought would have been easy for them (Mazur, 2009). He realized that "the traditional approach to teaching reduces education to a transfer of information" (p. 50). Moore et al. (2014), who applied the flipped classroom model on math classes, remark that getting to know their students' thought process through richer in-class interactions over problem-solving tasks, "strengthened our practice as teachers and made us feel that our investment in setting up the flipped classroom was worthwhile" (p. 424). Within a global context and the technological advances that have provided us with immediate access to knowledge, such a shift seems inevitable, self-evident, and fitting our rapidly changing world (see the Figure 2 for the inter-relationships of processes in technology-enriched and flipped classrooms, and parent involvement).

Figure 2.
Technology-Enriched and flipped classrooms: processes and parent involvement.



4. FLIPPED CLASSROOMS, FLIPPED HOMES?

Since a flipped classroom format places an emphasis on student preparedness prior to coming to classroom, does it follow that flipped classrooms require families to take on a greater role in their children's education, and become ad hoc instructors? This would be an erroneous inference and the antithesis of what lies at the core of the flipped classroom approach. First, students have always been asked to complete work at home, and parents have always been faced with homework questions, some of which they could address, but most others needing teacher assistance the following day. The nature of homework requirements within the flipped classroom changes as concept applications are completed in class, while informational aspects are studied at home. This change seems to be appreciated by students as they welcome the opportunity to review lectures, or other online material as many times as each needs to have a solid basis going to class. A tenth grader notes, "I liked that we watched the concept at home, but then mastered the concept in class" (Fulton, 2012b; p. 14). A high school senior adds, "I liked how I could rewind and pause lectures in case I didn't understand something" (Fulton, 2012b; p. 14).

Second, and directly tied to the previous point, inherent in the flipped classroom approach is enhancing the independence of the learner which is an essential element for the net-generation. Not only because extended computer use and access to information has

forced more independence and individuality of learning, but also due to the globalization of knowledge and the job market, which make learner self-reliance and independent information-seeking a must for success.

An additional benefit of flipping the work directly related to family life, is that it alleviates the heavy burden that homework often places on families. Since applications, which would have otherwise been assigned as homework under the traditional approach, are primarily completed in class, students can ask questions and seek out help from their teacher, instead of struggling to tackle the work at home with parents in the striking majority of cases unable to help. Fulton (2012b) reports that 84% of parents whose children were exposed to the flipped classroom model reported that this was their preferred instructional delivery mode for their children. One parent put it succinctly, "That [flipped classroom] approach is much more helpful to students. Less frustration for all of us!" (Fulton, 2012b, p. 23).

Extended technology use by schools, not only within a technology-enhanced classroom framework, but, also, in a school's general outreach to families, has been shown to enhance and strengthen home-school collaboration. For example, tech-based logging of tardies and absences can directly alert parents and keep them informed in real time. Schools' intranet systems also allow parents to monitor student progress, as well as content and activities, on demand. Communication, especially between teachers and parents of students with learning or behavioral issues is also increased, and, by keeping parents informed and involved, arguments between parents and children are reduced, and a stronger bond can be forged between parents and children on learning issues. In addition, school personnel benefited from the enhanced parent involvement by gaining more insight into students' home environment, leading to higher commitment and trust between school personnel and parents (Telem & Pinto, 2004).

Technology can also facilitate various home-school interactions in additional ways. Specifically, proactive communication between teachers and parents becomes easier and faster, and, therefore, it can further enhance home-school partnerships, a powerful factor in academic, social, and emotional learning (Patrikakou, 2015, 2016). With the convenience of technology allowing for both asynchronous and synchronous modes of communication[11] schools can establish bi-directional, ongoing, mutually-beneficial interactions that enhance clarity of expectations, detail student progress, and keep parents abreast of pertinent information (Olmstead, 2013). With the physical presence of parents not necessarily required at school in order to actually be involved in the educational process, not only home-school communication can be enhanced, but also parent involvement in general can be increased. Parents can be connected and electronically present in school happenings more frequently, overcoming time and location barriers posed by job and other family responsibilities.

Opportunities for additional parent involvement at home are also created, with students sharing with their parents media and discoveries involved in their new homework - this can be facilitated by teachers, and, also, by parents themselves with teacher encouragement and guidance. In this way, students can use their tech-savvy ways to connect with parents and include them in their media-dominated world meaningfully, instead of alienate and isolate themselves.

[1] *Asynchronous* communication refers to communication not occurring at the same time, such as sending an email or a text; *synchronous* communication refers to communication occurring at the same time with all participants being logged on simultaneously, such as a webchat, FaceTime, etc.

5. CONCLUDING

A shift in pedagogical thought has emerged prompted by the technology and internet boom, shifting workforce demands, and the reality that the global pace of change is swift, decisive, and irreversible. Inherent in the demands that these changes pose is the realization that successful learners must have a flexible cognitive schema in order to deal with the ever-changing patterns and needs, and, also, to be nurtured within the framework of competency-based, personalized, technology-embracing education. The basic principles that lie in the heart of responsive, caring education have not changed. What has changed is modes of communication and instruction-delivery options, due to rapid technological developments, workforce demands, and the competitive nature of globalization. As with any and every innovation, its use is as good as its users. Technological enrichment cannot only enhance classwork and homework, but it can significantly strengthen home-school relationships to further support student success in school and beyond.

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