Flipped Learning Model: The Role of the Constructivist Learning Theory

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Abstract

With the evolution of technology tools available for use for education, teachers are open to structuring their classrooms in innovative ways. The flipped classroom (inverted classroom) has been active in the educational community and is an innovative structure that moves the traditional classroom lecture outside of the class and moves homework and practice with concepts into the classroom through learning activities.

This paper considers the approach to the flipped learning model, a constructivist learning theory and collaborative learning environment in Jonassen & Land’s (2012) framework as a guide. The articles synthesized in this paper considers all aspects of ‘Flipped Learning’, aka ‘Flipped Classroom’, from the use of interactive tools and cloud-based technology and its impact in the classroom setting as well as teaching and learning styles. Articles referenced in this paper look at issues related to the best approach for presenting the benefits of classroom collaborative learning environments. Particular emphasis placed on teachers and their role as facilitator and guide within the flipped learning environment.

Keywords: Flipped learning; Classroom Flip; Inverted Classroom; Activity Theory; Instructional design; Constructivism; Instructional landscapes; Technology and Education.
INTRODUCTION

Bloom’s taxonomy divides educational learning objectives into three domains: cognitive, affective and psychomotor (Bloom, 1956). According to Bloom (1984), a student who receives one-on-one attention and given constant feedback and correction can jump into the 98th percentile of the student population in academic achievement. Though this study caught attention, it has not changed teaching practice as this type of instruction is too expensive.

There are many psychologists such as Vygotsky, Piaget and John Dewey who have worked to develop Social Constructivist Learning Theory (CLT). This theory focuses on the belief that solving problems helps individuals in thinking, learning, and development. Problem solving helps individuals in taking their own unique experiences and expertise to find a solution and once they do, they all extract unique lessons from it (Jonassen & Land, 2012). According to Jonassen & Land “Vygotsky's work with the zone of proximal development and scaffolding are important considerations” in CLT (p. 272). The aims are to identify how to implement learning processes in the classroom, and how knowledge is constructed.

The concept of Collaborative Learning Environment (CLE), is a system specially developed to support the participation, collaboration, and cooperation of users sharing a common goal. CLE design should take into account social factors to discover and describe existing relationships among learners, existing organizational structures and incentives for collaborative action (Zaraté, Belaud, Camilleri, and Ravat, 2008). This area addresses the environment of learning and how learners working collaboratively to achieve particular goals under the umbrella of Constructivist Learning Theories (CLT).

Constructivist learning theories, along with emerging educational technology tools, have enabled many of the theories to be utilized in many new ways. With the increased availability of Web-Based Instructional (WBI) technologies, like Moodle and Learning Management Systems, instructors are able to provide students with access to course content via video and PowerPoint lectures outside the classroom
(Lage & Platt, 2000). With the delivery of course content via technology, teachers have more time to introduce activities inside the classroom that would give students the opportunity to engage material in an environment where other students and the professor are present to aid in the learning process.

The 'Flipped Classroom' is a model of teaching that utilizes educational technology and active learning to positively influence the learning environment. This change in how course content is introduced to and engaged by students is a significant departure from the lecture-homework cycle found in the more traditional classrooms (Strayer, 2012). The biggest departure is the physical location of where the introduction and deeper engagement with the material occurs. Traditionally, the introduction is given in class through a lecture, and the deeper engagement occurs outside of class through homework. In flipping the classroom, the introduction occurs outside of class and the active engagement occurs inside the classroom. Researchers have come to dub this flipping of what is traditionally done inside and outside the classroom the “classroom flip” (Baker, 2000) or the “inverted classroom” (Lage, Platt, & Treglia, 2000).

When designed, ‘Flipped Learning Model’ embodies the values and assumptions of constructivism (Land & Hannafin, 1997) and similar to student-centered learning environments. However, as Jonassen (1999) points out, learning environments can operate differently though they share common epistemological foundations and assumptions. It is extremely difficult to develop a fully-inclusive model for the design of constructivist learning due to the complexity and variety of learning environments. Despite these complexities, Jonassen (2012) provides a framework that can serve as a guide for the design of learning environments.

**What is a Flipped Learning Model?**

Flipped learning incorporates elements of traditional learning – interaction, exploration, social conversations among people with new and continually evolving elements – personal interaction, networking, technologies, and digital media.

The ‘Flipped Learning Model’, as developed by Jonathan Bergmann and Aaron Sams (2013),
moves from the traditional classroom setting of lecture then student doing homework and turns it around:
(a) lectures are delivered outside the traditional class time, via a video students view on their own time;
(b) Class time is used for active problem solving by students either as one-on-one or as a group tutoring
with the students (Fulton, 2012).

The flipped classroom model encompasses any computer or personal devices (mobile
technology) as a means of access to the Internet to leverage the learning in the classroom. This then
leads to the traditional classroom as a student learning environment where teachers can spend more time
interacting with students instead of lecturing. This provides the instructors the opportunity for tutoring and
adds a module that gathers information on the students with regard to the student’s understanding of the
content, learning patterns, and personal preferences/learning styles.

A Framework for Designing Flipped Learning

Beginning with the development of a traditional classroom teaching lesson, or unit, the model
considers all aspects of planning for flipping the classroom. The role of the teacher is that of a
consultant working to lay the groundwork and provide support for learners throughout the process,
with the ultimate goal being to complete a project (Jonassen, 1999).

The theoretical framework concept map (below) is
for investigating learning activity in a classroom
structured using the classroom flip. Through the
use of virtual educational technology tools course
content can be delivered in the cloud and out of
the classroom; ergo the flip. Tools such as: TED
& Khan Academy for access to instructional
video; Blogs and Wikis, where communication and collaboration can take place; Google Docs that
provide a suite of processing tools; and/or Prezi for presentations are just a few examples that are
available. Active learning during class time is the other side of the classroom flip and happens within the
classroom. Both influence student’s learning environment in fundamental ways. These core ideas drive the conceptual framework.

**The Problem and the Driving Question**

With the increase in availability and quality of computer based instructional technology, both college and universities are “flipping” or “inverting” their classrooms by using technology to introduce students to content outside of class and actively engaging concepts inside class. For example, Boise State University uses a content management system (Moodle) that provides the instances where the classroom flip is used, the professors chose to use this format in order to give students a chance to actively engage course material without losing the coverage of course content (Baker, 2000; Lage et al., 2000). While not yet a formal community of practice, ‘Flipped Classrooms’ has infiltrated the K-12 environment and gaining popularity in the press through Kahn Academy (Kahn, 2004).

The idea that course content can be “delivered” is founded on behaviorist theories of learning where knowledge is viewed as an objective entity that can be transferred from one person to another (as learned skills or strategies of thinking). Active learning techniques have been used over the past few decades by educators who adopt constructivist theories of learning which view knowledge as something that must be built up by the learner through reflective abstraction. Thus, a classroom flip environment could end up being a place where the outside class activity is driven by one learning theory, and inside class pursuits are driven by a different theory, i.e. Community of practice (Printy, 2007).

**The Role of the teacher using educational technology tools for the ‘Flipped Classroom’**

In Vygotsky’s model, ‘Zone of Proximal Development’, the distance between what the learners understands within an assigned task and can complete without assistance provides user control (Jonassen & Land, 2012, p.245). At this point, instructors will take the traditional classroom lecture and record the content(s), then host them in an educational technology virtual tool; i.e. Moodle. In this classroom flip, students will have access to the content and resource(s) anytime and using their favorite mobile technology tool (iPad, iPod, smartphone, tablet or computer). By providing learners with online resources and
downloadable media learners can control when and how the media is used. Flipping the role of the lecture allows students to pause and rewind their teacher giving students control (Flipping, 2012).

**The Role of the teacher in the classroom**

The role of the teacher in the social constructivist classroom is to help students to build their knowledge and to facilitate the experience of students during the learning process in the classroom. The instructional content support plays an important role in the designing and delivering scheme within the classroom. By scaffolding instruction within the flipped classroom, the teacher supports the learner’s environment (Jonnasen, 2002). The idea of the limited role of the teacher is that this encourages students to engage in collaborative work and mastery of concepts become the key goals of class time (Kelley, 2012).

**Learners’ activities in the classroom**

Learning activities can be defined as, synchronous activities conducted during face to face instruction time of the educational activities that learners complete in the classroom. These activities can be written activities, readable activities, thinking activities... etc. Both CLT and CLE advocated that, participation in learning activities is valuable work. These activities can enhances students’ collaborative skills, provide students with opportunities and helps them understand new knowledge and strategies. Classroom time focuses on higher order thinking skills from Bloom's Taxonomy (Kelley, 2012). It helps students to examine their thinking processes and recognize the need to revise their thinking (Turner and Patrick, 2004).

According to Zhan (2008), collaborative learning activities can engage students’ participation, and interaction, working together toward a common academic goal, and increasing the level of satisfaction and feelings of connection and community. These activities can be seen clearly in flipped classroom. For example, in a flipped class the learning environment encourages student responsibility for learning and this fits in well with social constructivist approach.
The ‘Flipped Classroom’ provides opportunities for teachers to become facilitators of learning by moving away from the traditional classroom approach of lecture and assigned homework approach to teaching. The difference between flipped classrooms in traditional practices is how scaffolding techniques are used to support reasoning and develop problem solving skills. Through scaffolding, teachers can provide the steps necessary to ensure exactness of knowledge for content development to support students learning development. Within the classroom activities are designed for items such as group work, questioning, or synchronous instruction. This provides the scaffolding of instruction for learners at the correct level of complexity and difficulty for the lessons to be learned. The teacher thereby can act as the facilitator for students individually or as group study. In addition, instructors are also able to understand students’ level of understanding and provides the opportunity to give clarification and immediate feedback for student support and helping students who struggle the most (Flipping, 2012). Through this independent learning and reach a higher level of understanding. Such techniques can include, but not limited to, graphic organizers, prompts, essential question on content objectives and modeling.

According to Jonassen (2012), modeling is the most common instructional support used in a constructivist learning environments. Behavioral modeling of performance is often carried out through worked examples during which every step and decision is communicated.

Employing the Constructivist Learning Theory (CLT) and Constructivist Learning Environment (CLE) in the Flipped Classroom Environment

CLT is a suitable theory of learning for both teacher and learners, due to the characteristics of this theory being consistent with the role of the teacher in teaching and students in learning. As mentioned in the course of this paper, students dealing with technology in groups benefit from each other. This theory states that learning is an active process of creating meaning from different experiences (Brooks and Brooks, 1999).

Thus, the teacher facilitates the transfer of the information to the students. Furthermore, a teacher
plays the role of facilitator more than a teacher’s role. According to Sims (2002), people learn best by trying to make sense of something on their own, with the teacher as a guide to help them along the way (Gerding, 2007, p.28). The word facilitator is more appropriate than teacher in social constructivist context (Lambert, 2002) where the learner is actively constructing knowledge, rather than passively taking in information. Furthermore, learners interact with each other in a collaborative environment.

Throughout the ‘Flipped Learning Model’ experience, the teacher’s role involves: (a) providing students with access to information; (b) providing scaffolding, modeling and guidance to students; (c) encouraging the use of Meta cognitive learning processes; and, (d) assessing progress, diagnosing problems, providing feedback and evaluating results.

Jonassen (2012) describes three specific types of instructional supports that teachers can provide. These include: modeling, coaching, and scaffolding.

**Modeling**

According to Jonassen (2012), modeling is the most common instructional support used in a constructivist learning environments. Behavioral modeling of performance is often carried out through worked examples during which every step and decision is communicated. Modeling of cognitive processes, also known as “reflection in action”, involves communicating reasoning and decision-making processes while actively solving a problem (p. 13). Jonassen (2012) states that the purpose of cognitive modeling is to make the cover evident, so it can be analyzed and understood. In this way, learners gain an understanding of “why”, as well as “how”, to carry out a task (p.14).

**Coaching**

This type of instructional support involves having learners attempt to perform like the model (Jonassen, 2012). When coaching, the teacher’s role is to provide support by motivating learners, providing hints, analyzing performance, prompting the use of appropriate thinking strategies, cognitive tools or informational resources; providing feedback and advice; and, encouraging reflection on the
learning, assumptions and strategies employed. If novice learners have inaccurate or incomplete mental models about a problem they are solving, an instructional coaching strategy known as “perturbing the learners’ understanding” can be used (p. 16). This technique involves asking the learner provoking questions in order to promote self-reflection and encourage awareness that the problem can’t be solved with their current mental model.

**Scaffolding**

Scaffolding refers to temporary supports to help student’s bridge the gap between their knowledge and their skills (Bell, 2010). Scaffolding is critical for students who aren’t proficient in using thinking strategies. Jonassen (2012) suggests three approaches to scaffolding: adjusting task difficulty; restructuring the task; and providing alternative assessments.

**Conclusion**

Flipped classroom isn’t the first time that technology has been held up as a solution for the worldwide challenges that are occurring in education, and it won’t be the last. However, the focus of flipped teaching is different from other examples in that technology itself is simply a tool for flexible communication allowing educators to differentiate instruction to meet individual student needs and spend more time in the classroom focused on collaboration and higher-order thinking. The technology solutions are varied and don’t have to rely on just one virtual educational technology tool to implement. The Flipped Learning Model is a great example of using technology with intention.

Frameworks such as Jonassen’s (2012) provide suggestions for tools, techniques and resources that teachers will need for successful implementation and management of ‘Flipped Classrooms’ constructivist environment. Because the teacher’s role is so critical to the success of ‘Flipped Learning’, designers need to ensure that ongoing support systems are established through peer networks, websites and other emerging technology tools for teacher resources. Ultimately, it is through the role of consult and the instructional designer will be most effective in laying the foundation for
supporting teachers as they guide learners through the 'Flipped Learning Model' experience.
References


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