# Journal for the Advancement of Educational Research International

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# Journal for the Advancement of Educational Research International

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# TABLE OF CONTENTS

**Editor's Note: In This Issue**

   The *Journal of The Advancement of Educational Research International* (JAERI) is tasked with providing a venue for scholars to share research projects, position statements and policy studies that contribute to a betterment of the educational experiences for today's youth. While 2020 has been a challenge for many of us, I am excited that we have some well written papers that we present in this issue. Although this issue is shorter than usual, we are excited with the contributions and look forward to a fuller issue in 2021 as the world returns to some semblance or normalcy.

   Starting this issue strong, Dixie Abernathy presents an exciting study which explores self-regulation in graduate students working within an online program. In *The Impact of Introducing Self-Regulated Learning Strategies in Online Graduate Studies,* Dixie presents findings that offer some guidance for others who are looking for ways to support students with potential self-regulation strategies. Using data collected from cohorts of graduate students, this study teaches us much on ways to build support for all online students.

   A group of scholars explored an important segment of our K-12 population, namely those with Attention Deficit Hyperactivity Disorder. Jay Scott, Megan Lyons, William Truby, Lantry Brockmeier, Ty Jiles and Rudo Tsemunhu present *Understanding Executive Function Deficits in Adolescent Students with Attention Deficit Hyperactivity Disorder*. This work is a case study which examines an eighteen-year-old male and explores the role of executive functioning and its relationship to academic performance. They close their study with several important messages for supporting this population of students in their academic endeavors.

   Robert Ceglie investigates some of the most prevalent theories which have been used to help explain effective online learning outcomes in *Examining Theories which Support Online Learning: Ideas for a New Integrated Model*. His work explores and dissects some of the most relevant theories of online learning. Through this work, Robert suggests several adaptations of these theories as a means to build and support a more inclusive integrated model to use for future research.

   Corbin Robinson closes this issue with two thoughtful position statements to consider. The first, *Safe Spaces for All***,** is a discussion of the lack of policies in schools as they are not adequately providing safety for students in the LGBTQ community. Secondly, in *Pre-Service Educators and Professional Development on LGBTQ Youth in Higher Education*, Corbin describes the importance of providing adequate training for preservice teachers to design inclusive teaching methods to support LGBTQ students. Both of these papers offer important guidance to help build more inclusive schools for our students.

Robert Ceglie PhD
AAERI Journal Editor in Chief

# The Impact of Introducing Self-Regulated Learning Strategies in Online Graduate Studies

**Dr. Dixie Abernathy**

**Queens University of Charlotte**

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## Abstract

With the increased use of online teaching and learning at both the higher education level as well as in K-12 venues, practitioners and researchers alike actively seek better ways to ensure online success for all students. Factors such as technological prowess, classroom preparation, and self-motivation can all impact the mastery of objectives in the virtual learning environment, but there are other factors that hold promise in terms of helping online students to achieve. These strategies are ones that have been relevant to teaching and learning for quite a while in more traditional learning modalities. While students utilize these various strategies in varying degrees, might the simple knowledge that these strategies, known as Self-Regulated Learning Strategies (SRLS), help the online students, and specifically graduate students, with successful acquisition of learning objectives? In addressing this question and others, student perceptions were gathered as a part of a study on SRLS in the online graduate classroom. This article examines the results of that study and the implications moving forward.

**Key Words:** Graduate Student Success, Online Teaching and Learning, Self-regulated Learning Strategies.

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## Introduction

As pointed out by many educators and researchers, online learning holds much promise and many benefits for online learners. When taught well, these include cost-effectiveness, flexibility of scheduling, and quality learning (Burns, 2020). Unfortunately, despite these advances and attributes, studies have shown that the drop-out rate for online students can be as much as double that of students in traditional face-to-face learning modalities, and even reach as high as 60% (Burns, 2013; Levy, 2007). In addition to the challenge associated with simple retention of online students comes the desire to see students in all environments succeed and learn to their full potential. The study of any approach or knowledge that may be useful in driving success is of significant worth. Self-regulated learning has long been acknowledged as holding the potential for positive impacts on learning, but might these approaches also make a difference in less-than-traditional educational settings? It is worth considering if this is true for students in online modalities at the higher education level and thus the study of self-regulated learning and the influence it may hold in successful online learning modalities has gained interest and attention (Cassidy, 2011).

**Background**

**Self-Regulated Learning Strategies (SRLS)**

At its core, self-regulation refers to a learner's use of metacognitive, motivational, and behavioral processes in working towards a goal, as in a learning goal (University of Nebraska-Lincoln, 2020). In a nutshell, metacognitive processes are those associated with our conscious focus on acquiring and retaining knowledge, motivational processes are those that we choose, such as avoiding distractions in our learning environments, and behavioral are the choices we make to deliberately ensure and improve our success (such as asking for help). This self-regulation involves three phases the learning must go through, including forethought, performance focus, and reflection (Zimmerman, 2011). As learners work through the processes above, in these three phases, they are engaging directly in self-regulatory behavior, and this behavior is often personalized and tailored to their own circumstances or experiences (Zimmerman, 2002). At times, the self-regulatory behavior can be seen as a means to an end, and for other learners, it may be perceived as the end itself (Pintrich, 2020). The questions hypothesized are: what impact can this have and is that impact relevant to the online learning environment? While self-regulated learning strategies may be defined or identified in various categories, some of the most prevalent or widely discussed are highlighted here, with each analyzed against the backdrop of prior research or use.

**Goal Setting.** Even as young learners ourselves, many of us may remember being encouraged to write goals for our work, our learning, or our future aspirations. The exercise of writing goals has, in recent decades, parted from the once personal exercise of self-motivation to the strategic step now expected in organizational planning. Educators and students at large are now very familiar (much too familiar, according to some observers) with the art and practice of goal setting. However, SRLS research suggests that the ability to set individual goals, both short- and long-term, may, in fact, be a helpful self-regulation tool that leads to learner success.

The setting of goals as part of the learning process includes not only the goals themselves, but also the ongoing process of monitoring progress towards these goals (Chen, 2002; Zimmerman, 1989). In order for this self-regulation to be effective, it is important that goals be very specific and focused on targeted outcomes from performance (Chen, 2002). When done well, goal setting may even have a positive influence over other self-regulated strategies, such as the ability to self-evaluate how effectively certain actions led to goal achievement, or how time management impacts the ability to reach one's goal.

**Time Management.** The ability to manage one's time has long been the barrier for many the student, starting from the early days of Kindergarten and extending into the dissertation defense for the doctoral student. One would think that with the advancement of digital management tools, such as digital calendars and phones that "ding" us fifteen minutes in advance of our next meeting, time management would be a breeze for even the most disorganized of learners. However, with the advancement of time-managing technology has also come hurried and busy lives, daily calendars filled with a plethora of activities, and the constant temptation of "more" technology (but we will get to that issue under "environment setting").

In research conducted well before online teaching and learning was prevalent, the team of Britton and Tesser (1991) concluded, from surveys of college undergraduates, that those who seemed to accomplish learning objectives with the high levels of success were also those who

had developed ways to set short-term plans for the time they had. In the words of the researchers:

[S]tudents who happen to do well in school somehow come to develop short-range planning skills and positive attitudes toward time. Although it is not clear what the mechanism(s) are by which such transformations would take place, this interpretation is not plausible on design grounds. Although high school success could have fostered time management, in this prospective study measures of time-management attitudes and skills were taken prior to the unfolding of grade point average. (1991, p. 4)

These early conclusions could certainly lead one to assume that time management, like all self-regulated strategies, can be practiced, improved, and even discovered. In more recent studies, such as Khan's higher education research, students who report the ability to effectively manage time not only achieve at higher levels but experience less anxiety and stress in doing so (Khan, 2015).

**Environment Setting.** Even in the early days of Kindergarten, students are often reminded to avoid distractions and to stay focused on the work at hand. Teachers can be heard from all corners of the schoolhouse reminding students to "keep your eyes on me." It is no surprise that distraction, in the educational setting, has become synonymous with "off-task behavior." Even at the higher education level, certain spaces and classroom decorum are respected in order to provide what might be deemed as appropriate learning settings, especially in light of the variety of backgrounds and learning styles students may bring with them to the university level (Radhakanta, 2012). While in those college classrooms and in those school buildings, there are significant controls over the student's learning environment, yet the same cannot be said for the online learning environment. While learning online, the learner has all control over the selection of the learning environment, and these choices and the ways in which the learner is able to monitor and regulate these choices, may have a significant impact on learning. While much is researched and written in regards to the appropriate setting for the online course itself, very little is available on how students make choices in regards to their own settings, and how the presence or absence of other technologies, entertainments, and people within that setting may or may not affect each individual leader's success.

**Task Strategies.** Self-regulation can be a very cyclical process, with learners taking a step backwards, to plan and plot various tasks and steps, prior to even starting the learning process. This can sometimes feel like an unproductive use of time, which is one reason that some learners shy away from this important planning step (Sage 2YC, 2020). But asking simple questions such as "have I completed a similar task before?" or "can I use skills I have previously acquired on this particular task?" may actually save time in the long run. In addition, planning and preparing for tasks may also include a "plan B" for when things don't go according to plan (Flanagan, 2014). Planning for and monitoring the completion of tasks is a self-regulated strategy that appears even more relevant in light of the multi-step learning so often utilized in graduate learning.

**Help Seeking.** With stress and anxiety rates almost six times what they are for the general population, graduate students are a sub-group often in need of specific help and encouragement (Flaherty, 2018). But, as pointed out through the research of Koc and Liu (2016), this help-seeking mechanism must sometimes be triggered through the use of intentional

technologies and formative assessments that encourage online students to "search for … a strategy to obtain success" (p. 1). Further conclusions from this research indicate that when students do "engage in appropriate help seeking behaviors and instructors provide effective help mechanisms and tools, increase learning gains can be achieved" (p. 1).

**Self-Evaluation of Learning.** Self-evaluation can be effectively used not only in determining how successfully learning objectives were met, but how successfully other regulatory decisions were in leading to that end result. For example, learners may self-evaluate various environments that were used during the learning process, and which seemed to lead to the best results (Sage, 2YC). And even when success if not reached, self-evaluation may be completed in terms of the effort or strategies used, and not in terms of the ability of the student.

In a related study, it was found that self-efficacy may have a role to play in the use of self-regulated strategies including self-evaluation. The more self-efficacious the student, the more willing and able they are to engage in self-regulation. In the words of the research team, "Those with a high sense of self-efficacy tend to use cognitive and metacognitive strategies and to persist in difficult or uninteresting tasks" (Demiroren, Turan, & Tasdelen Teker, 2020, p. 2).

## Course Design and Self-Regulated Learning

Due to constraints on time and the breadth and depth of curricular and learning objectives, graduate programs cannot necessarily teach and assess the use of self-regulated learning strategies within the structure of course learning. However, there are opportunities for course designers and instructors to make the knowledge and understanding of self-regulated learning strategies and their potential impact on program success a part of the overall graduate experience. For example, when considering the self-regulated learning strategies associated with help-seeking, Mary Burns (2020) suggests that courses be designed to encourage interaction amongst students and faculty, thus making help-seeking more natural and encouraged. She adds that "it is emotionally and cognitively powerful to wrestle with difficult concepts, interpret information and to do so communally" (p.2).

Another powerful way to remind students of the self-regulated strategies at their disposal is to provide an orientation that specifically addresses self-regulation. Details such as what it is and how students can attain it should be shared in explicit terms (Burns, 2020). Other design components that may encourage self-regulatory practices are inclusion of short-term goals for students to follow, brief or shorter-termed timelines, and estimates of how much time a particular assignment may take. These goal setting and time management triggers may actually encourage students in the short-term, and then lead to more use of self-regulated learning strategies in future courses (Burns, 2020).

Even in the best of circumstances, in learning that involves students with a plethora of self-regulated learning skills at their disposal, self-regulation is just one component of the overall learning experience. As shared by Paul Pintrich (2020):

> All the models assume that learners can potentially monitor, control, and regulate certain aspects of their own cognition, motivation, and behavior as well as some features of their environments. This assumption does not mean that individuals will or can monitor and control their cognition, motivation, or behavior at all times or in all contexts, rather just that some monitoring, control, and regulation is possible. …there are biological, developmental, contextual, and individual difference constraints that can impede or interfere with individual efforts at regulation. (p.1)

Ultimately, it may require that graduate level online learning environments make major philosophical shifts, and design courses not according to what we the instructors are going to cover, but how we the instructors, will foster the intellectual development and evaluation of learning from our students (Dash, 2014).

## In Practice: Embedding Self-Regulated Learning Strategies

While an increasing body of research on self-regulated strategies and graduate learning builds, this connection is still not one that is easily prevalent in all sectors of higher education or within the mindset of all graduate learners. As Dash (2014) shares, "Unfortunately, self-regulated learning has not been applied to graduate education" (p. 1). In the spring of 2019, an online, graduate Master of Arts in Educational Leadership program, offered at a private Southeastern university, engaged in a total course redesign process. As part of this redesign, research regarding self-regulated learning and the use of such in increasing the success of graduate students in online programs was considered. As such, the redesign process included an intentional focus, during the first course of the program on self-regulated learning strategies introductions and reminders, and the sharing of various articles and studies on each strategy.

During the first week of the eight-week course, students are reminded of self-regulation and introduced to current research that suggests that self-regulations may improve student performance in online, graduate studies. At this beginning point, students are also given the opportunity to complete an optional survey, one in which their initial thoughts, understandings, and use of self-regulation are assessed.  In weeks two through seven, students are given specific foci on self-regulated learning strategies, such as time management, environment setting, and seeking help. During the final weeks, students are offered the opportunity to complete an optional survey, one in which they assess their own use or the impact of self-regulated learning strategies at this point in their learning. The figures below (Figures 1, 2, and 3) show samples of the self-regulated information that is embedded into this first course of the MEL program (Abernathy, 2020).

**Figure 1**
*Week One Self-Regulated Learning Tip*

### SRLS Weekly Tip #1: The Power of Knowledge

It is generally accepted that there are three procedural phases associated with self-regulated learning: the forethought phase, the performance control phase, and the self-reflection phase. Strategic processes that are driven by the learner and that precede any performance in learning are part of the forethought phase. Often these early processes are ones related to student intrinsic motivation. These skills and processes would include goal setting and environment setting. The second phase, or performance control phase, consists of skills or strategic processes that are happening during learning. Self-regulated strategies such as time management, task strategies, or seeking help when needed would be considered to be in this phase. The final phase of self-regulated learning is known as self-reflection or self-evaluation. This phase is associated with the reflective and evaluative action, on the part of the learner, to react to how the learning was self-regulated and the actual learning or result of such. Learners engaging in this phase are often able to self-evaluate and even adjust self-regulated strategies for future success (Barnard-Brak et al., 2010; Wandler & Imbriale,2017).

You may not have ever considered the extent to which you have or use self-regulated learning strategies. Now that you are beginning an online graduate program, this is the perfect time to explore in more detail and become more knowledgeable about your own SRLS preferences. Please complete the self-assessment of your SRLS at the link below. Pay special attention and make note of those strategies for which you assess yourself with a rating of 5 or less. Complete this survey no earlier than the conclusion of Week One and no later than Wednesday of Week Two of the course. **You will submit proof of completion of this survey by providing a screenshot of your survey submission during Week 2 to contribute toward your course participation grade.**

- **Self-Assessment of Self-Regulated Learning Strategies**

**Figure 2**
*Week Two Self-Regulated Learning Tip*

### SRLS Weekly Tip #2: Goal-Setting

Have you ever thought of yourself as a goal-oriented individual, or, more specifically, a goal-oriented learner? Research now indicates that the process of setting goals may motivate students at the higher education level. Not to be confused with rewards, goal-setting is the process of simply having a certain end point in mind and then keeping that end point in focus as one proceeds through the process or journey. The actual monitoring of progress towards the goal is a "metacognitive strategy and is often done through selective attention, rehearsal, elaboration, and structuring. Learners must desire to attain the long-term goal and must be prepared to overcome temptations along the way. Self-regulation requires that learners forego short-term gratification in an effort to achieve long-term goals" (Anderton, 2006, p. 158).

Are you interested in learning more about Goal-Setting and how this Self-Regulated Learning Strategy may positively impact your graduate learning? Check out the article "Can Goals Motivate Students", written by Alexandria Usher and Nancy Kober and published by the Center on Education Policy at George Washington University. The article is accessible using the link below.

- **Can Goals Motivate Students?**

**Figure 3**
*Week Three Self-Regulated Learning Tip*



> ### SRLS Weekly Tip #3: Environment Setting
>
> As a student in the Queens University of Charlotte MEL program, each of you are most likely juggling other responsibilities and roles outside of your graduate program work and learning. In fulfilling these roles which are naturally a part of your lives, it may sometimes seem impossible to grab a little bit of time to study or to find a little piece of a conducive environment in which to do so. The environment in which one chooses to learn, reflect, study and grow can be a significant determinant in success as a graduate student.
>
> Are you interested in learning more about Environment Setting as a Self-Regulated Learning Strategy? Search on your own for great resources, or check out this quick read (with lots of great ideas) on "10 Ways to Improve your Study Habits". This article was produced by Western Governors University and includes ideas related to turning off distracting devices, keeping your eye on the clock, and working in an organized setting. The link to the article is below.
>
> - **10 Ways to Improve Your Study Habits**

In spring of 2020, research was conducted into the impact of this approach, on learner awareness and use of self-regulation in starting the MEL program. The research study as well as the results and implications follow.

## Methodology

During the spring of 2020, graduate students in the Master of Arts in Educational Leadership (MEL) program at a private Southeastern university were given the option of completing an anonymous survey, both at the beginning of their first MEL course and at the end of their first MEL course. Because of the optional and anonymous nature of this survey, the number of participants completing the survey varied. The survey was designed to gage the participants' awareness and use of SRLS when just beginning their graduate work, and then to gage, after students had been introduced and reminded of the impact of SRLS, how students' perceptions may or may not have changed.

The survey design included 15 questions (on a Likert rating scale of 1-10, with 1 representing a strong disagreement to the statement of impact or use and 10 representing a strong agreement), each of which highlighted one of the following self-regulated learning strategies:

1. Goal Setting
2. Time Management
3. Environment Setting
4. Task Strategies
5. Help Seeking
6. Self-Evaluation of Learning

## Results and Analysis

For the first week's survey, 41 graduate students participated. The mean scores of their responses for each of the fifteen questions given are featured in Table 1.

**Table 1**

*First week of program*

| GOAL SETTING | Mean of all responses |
|---|---|
| Prior to or during the first week of the course, I set specific goals and deadlines for assignment completion or assignment "chunk" completion. | 7.51 |
| Prior to or during the first week of the course, I considered the program as a whole and set specific goals for my learning and my program completion. | 7.29 |
| ENVIRONMENT SETTING | |
| During the first week of the course, I engaged in my course (reading material, completing assignments, engaging in discussions) in environments that were conducive to task completion and learning. | 8.12 |
| During the first week of the course, I changed my physical surroundings when I found them to be non-conducive to my learning. | 8.61 |
| During the first week of the course, I minimized electronic distractions (television, cell phone, etc.) while engaging in my online course. | 7.29 |
| TIME MANAGEMENT | |
| During the first week of the course, I managed my time to complete work well ahead of course deadlines. | 7.34 |
| During the first week of the course, I met the goals I had set for assignment completion. | 8.00 |
| TASK STRATEGIES | |
| During the first week of the course, I used strategies that I know to be successful for me in understanding and utilizing new information. | 8.00 |
| During the first week of the course, I approached difficult tasks as challenges that I was well-equipped to successfully complete. | 7.63 |
| During the first week of the course, I monitored my thought processes as I was working towards my goals. | 7.61 |
| During the first week of the course, I established clear rewards or consequences for myself. | 5.78 |

| | |
|---|---|
| **HELP SEEKING** | |
| During the first week of the course, I was comfortable and proactive in seeking others' help (instructor, fellow students) as needed. | 7.20 |
| **SELF-EVALUATION** | |
| During and at the conclusion of the first week of the course, while working on my assignments and tasks, I evaluated my work and performance in terms of my potential and self-efficacy. | 7.73 |
| During and at the conclusion of the first week of the course, after the completion of my assignments and tasks, I evaluated my work and performance in terms of my potential and self-efficacy. | 7.81 |
| During and at the conclusion of the first week of the course, for those areas of my first week in which I believe I could have performed better, I am confident I can adapt in order to improve. | 8.98 |

**Analysis of First Week's Survey**

The graduate participants appear, from their responses, to be familiar with self-regulated learning strategies and how these strategies are used to improve learning. Every strategy featured and question featured, with the exception of the question on rewards, resulted in a mean score of over 7.00. This mean response would appear to indicate a group of graduate students who were already very familiar with SRLS and were already employing these strategies even during the first week of the first course of the graduate program. It is interesting to note that, out of fifteen strategies presented, the one that received the highest mean score was:

*During and at the conclusion of the first week of the course, for those areas of my first week in which I believe I could have performed better, I am confident I can adapt in order to improve. Score of 8.98*

As shared earlier, through the research of Demiroren et al. (2020), self-efficacy is related to and can be indicative of strong self-regulated skills. This extremely high mean score would certainly support the assumption of a graduate cohort with strong efficacious behaviors.

As a self-regulated category, Environment Setting had two of three questions receive high mean scores, with only "I minimized electronic distractions (television, cell phone, etc.) while engaging in my online course" receiving lower mean scores. There could be several possibilities for the way in which electronic distractions may be perceived differently in terms of environment. These could range from telephones that are needed close by for family or personal reasons; music, television, or "white" noise that is perceived as contributing to a better focus; or other electronic tools that are actually needed to assist with the learning process. For whatever reason, participants were much more likely to choose what they felt were conducive environments for learning as opposed to actually removing themselves from electronic distractions.

The question receiving the lowest mean response was the following:

*During the first week of the course, I established clear rewards or consequences for myself. Score 5.78.*

Rewards and consequences are critical components to task management, yet it would appear that these online graduate participants did not perceive the need for such or had forgotten that these are parts of task management strategies. This is interesting to consider since all students in the MEL program are, themselves, K-12 teachers or counselors. These are students who are very familiar, on a practitioner basis, of the use of rewards and consequences, yet apparently not so much in terms of their own learning. Thus, based on the first survey's responses and mean scores, several questions were evident as the researcher awaited the end of the course:

1. How might student perceptions of their use of certain self-regulated strategies change as the course, which included self-regulated reminders and tips, progressed?
2. How might the use of rewards or consequences be incorporated into learning after students were exposed to a reminder of task strategies?
3. How might students view their removal of electronic distractions after reaching the end of the course?

During the final week, students were once again given the option to take the survey. This time, the questions were in the same order and categories, but statements were given in relation to student behaviors during the course and the final week. In each week of the course, students had been reminded of self-regulated strategies and their potential impact on learning through weekly SRLS tips and research (see Figures 1, 2 and 3 for examples). The final survey was given with the purpose to provide insight into how self-regulatory behaviors may have changed during the course of these eight weeks of learning, based on the reminders and introductions to self-regulated learning strategies. Twenty-seven students opted to complete the second survey, the responses of which are analyzed below.

**Table 2**
*Post Assessment (at the conclusion of the first course) with Comparison*

| GOAL SETTING | Mean of all responses in first survey | Mean of all responses in second survey | Difference |
|---|---|---|---|
| Prior to or during the final week of the course, I set specific goals and deadlines for assignment completion or assignment "chunk" completion. | 7.51 | 9.04 | +1.53 |
| Prior to or during the final week of the course, I considered the program as a whole and set specific goals for my learning and my program completion. | 7.29 | 9.07 | +1.78 |

| ENVIRONMENT SETTING | | | |
|---|---|---|---|
| During the final week of the course, I engaged in my course (reading material, completing assignments, engaging in discussions) in environments that were conducive to task completion and learning. | 8.12 | 9.16 | +1.03 |
| During the final week of the course, I changed my physical surroundings when I found them to be non-conducive to my learning. | 8.61 | 9.33 | +0.72 |
| During the final week of the course, I minimized electronic distractions (television, cell phone, etc.) while engaging in my online course. | 7.29 | 8.93 | +1.64 |
| TIME MANAGEMENT | | | |
| During the final week of the course, I managed my time to complete work well ahead of course deadlines. | 7.34 | 8.67 | +1.33 |
| During the final week of the course, I met the goals I had set for assignment completion. | 8.00 | 8.60 | +0.60 |
| TASK STRATEGIES | | | |
| During the final week of the course, I used strategies that I know to be successful for me in understanding and utilizing new information. | 8.00 | 9.07 | +1.07 |
| During the final week of the course, I approached difficult tasks as challenges that I was well-equipped to successfully complete. | 7.63 | 8.93 | +1.30 |
| During the final week of the course, I monitored my thought processes as I was working towards my goals. | 7.61 | 9.04 | +1.43 |
| During the final week of the course, I established clear rewards or consequences for myself. | 5.78 | 7.78 | +2.00 |
| HELP SEEKING | | | |
| During the final week of the course, I was comfortable and proactive in seeking others' help (instructor, fellow students) | 7.20 | 8.68 | +1.48 |

| | | | |
|---|---|---|---|
| as needed. | | | |
| **SELF-EVALUATION** | | | |
| During and at the conclusion of the final week of the course, while working on my assignments and tasks, I evaluated my work and performance in terms of my potential and self-efficacy. | 7.73 | 9.19 | +1.460 |
| During and at the conclusion of the final week of the course, after the completion of my assignments and tasks, I evaluated my work and performance in terms of my potential and self-efficacy. | 7.81 | 9.19 | +1.39 |
| During and at the conclusion of the final week of the course, for those areas of my first week in which I believed I could have performed better, I am confident I did adapt in order to improve. | 8.98 | 9.48 | +.50 |

## Analysis of Final Week's Survey Results

In analyzing the responses garnered from the second survey, and in comparing these mean responses to the first survey, several immediate observations are noteworthy:

a. For all 15 self-regulated strategies featured in the survey, mean responses increased. This across-the-board increase in self-regulation could be attributed to different factors, one of which could be the introduction and reminders of SRLS embedded throughout the course.

b. The strategy realizing the highest degree of positive change in mean score was: "During the final week of the course, I established clear rewards or consequences for myself." This strategy gained 2.03 in mean percentage over the first week's responses. It should also be noted, however, that while realizing these increases, this strategy remained as the lowest mean response rate in the entire survey, at 7.78.

c. Another strategy realizing a high degree of positive change in mean score was: "Prior to or during the final week of the course, I considered the program as a whole and set specific goals for my learning and my program completion," under the Goal Setting category, with a 1.78 positive change. It is encouraging to think that perhaps being introduced to self-regulatory goal setting, students were more apt to plan ahead and to think of their own goals in more comprehensive terms.

d. Another result of note was the change in the "electronic devices" question under environment setting:

*During the final week of the course, I minimized electronic distractions (television, cell phone, etc.) while engaging in my online course. First mean 7.29, second mean 8.93, difference +1.64.*

With this positive change of 1.64, this strategy moved to be more consistent with the other

two strategies in this Environment Setting category. This could be interpreted to mean that the participants considered environment not only in terms of what they perceived as conducive or non-conducive to learning, but also in terms of removal of electronic devices that they knew to be counterproductive to learning.

## Conclusions and Implications

This research was the first phase in ongoing research that is planned in this area and with this program in terms of self-regulated learning and the impact of such on graduate student success. While the participant group was relatively small, and there were clear threats to validity based on the optional nature of the survey and the varying number of participants, there are some early conclusions that may be drawn nonetheless.

It cannot be overlooked that in all 15 questions, across all self-regulated categories, higher mean scores were posted by the end of the course than at the beginning. Whether this indicates that students became more comfortable and tapped into self-regulated experiences from prior learning, or whether this indicates that the self-regulated weekly tips embedded in the course were meaningful and impactful, that distinction cannot be made. However, it does appear to be a strong possibility that, when given information and reminders of self-regulation of learning, graduate students perceive themselves as having the ability to adapt and improve.

In addition, the idea of providing rewards or consequences for achieving tasks or goals may seem like an elementary idea, but this research would appear to suggest that graduate students are willing to try this strategy when given information and research links on how it might make a difference in learning and success. The increase in the mean scores for this question, the highest increase in the entire survey, would indicate that more students in the MEL program were utilizing rewards and consequences in the end than had thought to in the beginning.

Lastly, the high mean scores initially posted in the first week of the course would appear to indicate that, as a whole, the participating group in this research began graduate studies with a solid knowledge of and engagement in self-regulated learning. However, the change in the responses in terms of removal of electronic devices, would also appear to suggest that even at the graduate level, students are willing and able to explore self-regulation even in areas in which they may not have noted previous concerns. This particular conclusion has significant implication for research moving forward into how self-regulated learning strategies may improve the learning experience for graduate students engaged in online programs.

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# Understanding Executive Function Deficits in Adolescent Students with Attention Deficit Hyperactivity Disorder

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## Abstract

The purpose of this case study was to determine specific academic and social deficits in executive functioning exhibited by students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). The subject in the study was an eighteen-year-old male. Baseline data were gathered from researcher observations and teacher surveys. Self-evaluation surveys were implemented to determine how the subject perceived deficits in executive functioning in relation to his academic performance. This study shows that further research is needed in specific areas of executive functioning
.

**Keywords**: Academic Performance, Attention Deficit Hyperactivity Disorder (ADHD), Pre-service Teacher Education

**Introduction**

As far back as the early 1900s, educators and medical professionals have been aware of the behavior deficit known as hyperactivity. In fact, this "…diagnosis was used to characterize children, almost exclusively little boys, who seemed unable to sit still, listen to adults, and refrain from disrupting their school classrooms" (Brown, 2006, p. 4).

Over the last decade, more research has been conducted on how Attention Deficit Hyperactivity Disorder impacts students' behavior and academic achievement. As a result of this research, more best-practices are being implemented to address the specific characteristics and behaviors associated with difficulty paying attention and impulsive or hyperactive behavior. Now known as Attention Deficit Hyperactivity Disorder (ADHD), educators and medical professionals are still working to refine and understand the complexities of the disorder and the associated cognitive deficits that may contribute or are a result of ADHD. According to Sinha, Sagar, and Mehta (2008), "Attention deficit hyperactivity disorder (ADHD) is a common childhood onset behavioral disorder that affects up to 9% of school-age children" (p. 44).

Students diagnosed with ADHD in the past exhibited common characteristics such as inattentiveness, disorganization, and hyperactive behaviors. However, in more recent years, further investigation has focused on other factors that may contribute or result from ADHD; a growing area of focus is on Executive Function Deficits (EFD). Researchers have narrowed the components of EFD to the cognitive areas of the brain "…that includes the many skills required to prepare for and execute complex behavior, including planning, inhibition, organization, self-monitoring, mental representation of tasks and goals, cognitive flexibility, and set-shifting" (Ozonoff et al., 2004, p. 8). The wide-ranging areas of cognitive processing that encompass EFD and the symptoms related to ADHD make this combination of student deficits an area needing further research and understanding.

**Why is this Topic Timely?**

Gaining a better understanding of how these two deficit areas coexist in a student should be of great concern to educators and medical professionals. Using an illustrative 27-student classroom, if 9% of school-age children have a diagnosis of ADHD, three students' potential to be diagnosed with ADHD is a distinct possibility. Educators are already facing significant pressures for their students to perform at the highest academic levels. Applying other pressures of working with students who suffer from disruptive and inattentive behaviors can stall even the best-planned lesson. The addition of further negative influences from EFD – organization, self-monitoring, inhibition, and working memory in those same ADHD students – could cause chaos. While there is no suggestion that students with ADHD and EFD are unable to control themselves in the classroom, those symptoms can manifest in behaviors that distract more than the teacher or the students immediately near disruptive students. The more information and understanding educators have of these two coexisting deficit areas, the better prepared they will be in developing interventions for those students.

**Why Does This Topic Merit Review?**

There will not be a reversal in the current academic standards in the foreseeable future, and any effort that can help develop workable interventions for educators should

be paramount. The students discussed in the current research are not confined to special education classrooms; some of these students may be placed in a general education inclusion classroom(s) as the least restrictive environment. Special education teachers (intervention specialists) may not even be aware of the potential for these two deficits to coexist within the same student. Unless there is research that supports the development of interventions, then students and educators alike will struggle. While some interventions already associated with ADHD may be useful with EFD, the development of further information is necessary to determine if other strategies are better suited to specific academic areas. Or will an umbrella strategy provide sufficient support for students and educators?

### Review of Selected Literature

A vital point of the investigation and understanding of EFD in students with ADHD is whether the EFDs exist as a component of the ADHD deficits or are the EFDs a separate component deficit that has a negative impact in addition to the ADHD deficits. A study conducted by Biederman et al. (2004), hypothesized "that EFDs would be more prevalent in children with ADHD relative to control participants and would be associated with impairments in multiple domains of functioning" (p. 758). This construct for a study focuses on whether EFDs cause or contribute to the ADHD diagnosis.

Biederman et al. (2004) utilized a stringent screening process for the participants in their study. The "data from two identically designed case-control family studies of ADHD were combined…140 boys and 140 girls diagnosed with ADHD and 120 boys and 120 girls without the ADHD diagnosis" (p. 758). The participants were further screened and later excluded from the study if there were indications or diagnoses for "major sensorimotor handicaps (paralysis, deafness, blindness, psychosis, autism, inadequate command of the English language) or a full-scale IQ (Weschsler, 1974) below 80" (p. 758). The parents and the students (aged 6-17) were provided with the full study information, and each group had to provide written consent for the student to be involved in the study. The researchers utilized a battery of assessments that covered psychiatric, psychosocial, and cognitive assessments for all the participants.

The psychiatric assessment was measured by the DSM-III-R, the psychosocial assessments were measured by the Social Adjustment Inventory for Children and Adolescents (SAICA,1984), and the cognitive assessments were measured by the Wechsler Intelligence Scales for Children – Revised (WISC – R, 1974). Each of these participant groups and assessments was chosen in order to understand the potential connection between EFDs and ADHD – with the understanding that executive function is a process located within the frontal area of the human brain.

As the researchers dissected the data, it became apparent students with ADHD (with and without EFDs) performed at a lower academic level than students without ADHD. Those students who had ADHD with EFDs performed at an even lower academic level than students with ADHD and no EFDs. Biederman et al. (2004) also found students with ADHD and EFDs were over two times more likely to repeat a grade compared with ADHD – EFD participants, even after controlling for Socio-Economic Status (SES), Learning Disability (LD), and IQ. Children and adolescents with ADHD + EFD were almost three times more likely to have an LD relative to ADHD – EFD children and adolescents.

The researchers were able to begin to make a connection between the coexistence and the increased deficits of ADHD and EFDs. The study further pointed to the likelihood of grade retention, learning disabilities, and decreased academic performance in students with ADHD and EFDs. This likelihood suggests the coexistence of ADHD and EFDs has a serious impact on those students' academic performance and could potentially limit their success in the workforce – based on another finding in the study related to the socio-economic status of the student and the student's family.  This new piece of information suggests students with ADHD + EFD were from families in the lower strata of the socio-economic ranks. This suggestion pushes thought toward the potential connection between the parental association with ADHD and/or EFDs and how that connection may have limited their ability to succeed academically or in the workforce.  They suggested further examination needs to be directed toward "studies of children and adolescent samples and should specifically address the question of developmental influences on the association between EFDs and functional outcomes" (Biederman et al., 2004). The researchers offered several ideas that merit further review and consideration for educators and medical professionals.  The current indication is that each new study adds another layer of understanding but also adds more questions. Furthermore, they asserted, "more work is needed to further evaluate…and ascertain whether the effects of EFDs on school performance is realized only when it overlaps with ADHD" (Biederman et al., 2004, p. 6).

A similar study (Rikke et al., 2010) highlighted the impact on school-age children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD), and those children not diagnosed with ADHD using – academic, behavioral, cognitive, and motivational factors. The efforts conducted for this study were similar in that the researchers hypothesized a connection in students who had the diagnosis of ADHD and EFDs. Both teams believed one condition might be exacerbating the other. The researchers (Rikke et al., 2010) understood they were on potentially new ground in their efforts to link executive function deficits and the impact of that deficit in children with and without ADHD.  The research was conducted using multiple tasks to classify a student as having or not having an EFD. The limited research conducted previously had used only one task to classify an EFD in children, which the researchers concluded could provide less accuracy in the data collected.  The premise of the research was that an EFD was thought to have a negative relationship in children with ADHD—the additional deficit manifests as a higher degree of behavior issues, more inattentive behavior, and potentially a lower Intelligence Quotient (IQ) when compared to children with ADHD minus the EFD.

The researchers wanted to answer the central question of "how do children with and without an executive function deficit differ," (Rikke et al.,2010, p. 4) while validating the subtypes of ADHD. Several quantitative components were integrated into this study, specifically related to the manifestation of academic under-performance, negative behaviors, general cognitive abilities, and motivation. The study underscores a greater need to understand ADHD and the combined EFD deficit, or lack of an EFD in school-age children.

The study was conducted in Denmark and consisted of several larger student groups reduced to the final sample sizes. The sample size for children with ADHD was 48 (it started with 67 students referred to a psychiatric university hospital). The child, parent, and teacher versions of the Development and Well-Being Assessment (DAWBA)

was used to assess for the occurrence of ADHD. Students were evaluated for the study in two sessions lasting 1.5 hours each. The sample size for children with EFD was 187 (began with 207 students). Teachers distributed 1,148 invitations; students were recruited from schools found to be representative of the general Danish population, based on parental education level attained. Students without a diagnosis of ADHD or EFD had a sample size of 26 (began as 29 students; three master's level psychology students assessed children over 2.5 hours) (Rikke et al., 2010). Rikke et al. (2010) used the following tools to assess the students in all three samples for ADHD: The Strengths and Weaknesses of ADHD-symptoms and Normal-behaviors rating scale (SWAN; parents and teachers are asked about 18 DSM-IV ADHD corresponding factors from observations made within the previous month); the Academic Rating Scale (ARS; is a teacher-based set of questions related to academic performance in math, reading and spelling); and, Social Economic Status (SES; as measured by the parent(s) education level in years). EFD was measured using five executive function categories: response inhibition, spatial working memory, verbal working memory, planning, and set-shifting. General cognitive abilities were measured with the Wechsler Intelligence Scale for Children – Third Edition (WISC-III). Children in the sample groups for ADHD and EFD were administered a complete WISC-III. The children with no deficits noted were administered subtests of the WISC-III in block design, symbol search, and vocabulary information.

The data sets were analyzed using several approaches to account for the students' ages and the occurrence of ADHD, with or without EFD and the control group. Those breakdowns were further refined to adjust for the students by age range and the level of deficit, allowing Rikke et al. to review the data by age band and level of deficit. The study children were males and females, ranging from age 7 to 14 years; however, that breakdown was not included as part of the data sets outside of percentages. Unfortunately, there was no mention of the date range of research.

According to hypotheses developed based on previous similar research, "children with ADHD + EFD would be more impaired on school functioning and cognitive variables than children with ADHD alone; and, children with ADHD – EFD would manifest problems with affective decision-making and delay aversion" (Rikke et al., 2010, p. 5). The study's formative question, whether there are differences among students with ADHD and with or without EFD, was proven to exist. However, Rikke et al. found the differences to be minor compared to the original question and the hypotheses they used as the basis for the study. According to them, "few differences were found between the EFD subtypes of ADHD in behavior and school functioning domains, suggesting that children with ADHD + EFD do not simply constitute the more impaired end of the ADHD distribution" (p. 900). However, within this research, a lower IQ was found within the sample group of students with ADHD + EFD. While the differences were found to be minor in this study, Rikke et al. suggested that their study's sample size was limited and more exploratory than definitive. Again, this study provided some new information but also developed new questions related to ADHD and EFDs. The subject matter's uncertainty adds to the need for further research and comparisons of studies to synthesize information and findings.

While the first two studies in this review did not illuminate a causal connection between the two deficits, the impact is still strong. The findings help establish that a

student with ADHD and EFDs is functioning at an even lower level than a student with just ADHD. The outward manifestations of EFDs – inhibition control, inattentiveness, and lack of planning are recognizable. Still, they do not necessarily indicate the child is incapable of attaining academic success like his/her non-exceptional peers.  According to Schuck and Crinella (2005), "the most worrisome deficits of children with ADHD are not the product of low IQ, but rather of the instability of the control processes that govern everyday adaptations to the environment (i.e., EF)" (p. 275).

Another study that examined the combination of ADHD and executive function (EF) was conducted by Martel, Nikolas, and Nigg (2007). This study focused on the EF deficit and its connection to ADHD in adolescents and how the two deficit areas intersect.  This study mirrors several other studies designed to investigate the potential link between ADHD and EFDs.  However, this study added a new variable to the equation of the segmented ADHD types – Inattention-Disorganization and Hyperactivity-Impulsivity. This focus provides yet another layer that needs to be explored and understood by educators and medical professionals.

The participants were grouped as "182 adolescents (105 boys) ages 13 to 17 (22% ethnic minorities), classified as ADHD (85) and (97) as non-ADHD. The ADHD group included 43 ADHD-PI (primarily inattentive) and 42 ADHD-C (combined type)" (Martel et al., 2007, p. 1438). The participants were recruited through a mass outreach effort including "public advertisements, clinic outreach, and mass mailings to parents in local school districts" (Martel et al., 2007, p. 1438).  Following the mass public appeal the researchers began to draw-down on the participants "with families screened by telephone to rule out long-standing psychotropic medication, neurological impairments, seizure history, head injury with loss of consciousness, other major medical conditions, or a prior diagnosis of mental retardation, schizophrenia, or autistic disorder" (Martel et al. , 2007). Once past this exhaustive effort, families and teachers were further analyzed to include the "Child Behavior Checklist 9 (Achenbach, T.M.,1991), the Conners Rating Scale Revised (Conners, 1997), and the ADHD Rating Scale (DePaul et al., 1998)" (Martel et al., 2007). As the study moved forward, the researchers found that students with ADHD and without ADHD did not "significantly differ in age, ethnicity, or family income" (Martel et al., 2007). This finding could certainly have the effect of negating the previous study provided in this review. However, the details within each study merit consideration for the differences in the research and the variables included in the study.

The research suggests EFDs are particularly strong during the adolescent years and are not related to gender, IQ, age, and any coexisting deficits.  However, as the study progressed, the connection between ADHD-C and ADHD-PI was minimal; though, the inattentive behavior associated with ADHD was magnified with EFDs. In this study, the researcher sought to determine if age should be considered as a significant factor. Previous studies have indicated gender was a more significant factor.

Though there is well-recognized research that supports the concept females achieve a level of maturation before males in the adolescent years – that is not centralized on physical attributes and within cognitive abilities and emotional response (Huang-Pollock, et al., 2009). The researchers have also asserted adolescents with ADHD exhibit deficits in EF similar to those seen in children with the disorder, suggesting ADHD reflects more than just a delay in cognitive maturation (although it is possible that adolescents with ADHD may be developmentally delayed beyond their peers).

This study contributed to the collective knowledge available for the coexistence of ADHD and EFDs. As such, this study, like the previous studies, suggests a connection occurs for students with ADHD and EFDs. In fact, Martel et al. suggest, "it may be important for clinicians to evaluate executive functioning as part of a diagnostic evaluation of ADHD so that appropriate academic and remedial assistance can be provided" (p. 1443). This study is significant because while it addressed the need to understand how ADHD impacts executive functioning, it also caused researchers to address specific areas of executive functioning for students with the disorder.

The study conducted by Martel et al. (2007) is similar to the two previous studies explored in this literature review, in that it also examined the connections between ADHD and EFDs. However, it added another variable by singling out the ADHD types − Inattention-Disorganization and Hyperactivity-Impulsivity, which mirror external manifestations related to EFDs. This narrowing of focus could yield a deeper understanding of how ADHD and EFDs interact and their impact. As further information is developed, educators may be able to develop interventions that target manifestations that sabotage students' efforts.

Another study conducted in Sweden by Brocki and Bohlin (2006), indicated age was a prevailing factor. However, the participants' age was not the only prevailing factor of this study: an inhibition deficit is found in younger students, and an executive function deficit is found in older students. In some of the research, ADHD is presented as a developmental disorder. The symptoms related to inhibition control decrease as the student ages, but the inattention symptoms remain static as the student ages. They concluded that age has a significant impact on ADHD and EF's symptomology is another facet that adds answers and more questions.

The study participants (aged 6 – 13) were chosen and then broken into two age groups. The youngest age group ranged in age from 6 to 9.7 years and consisted of 48 children (23 boys and 25 girls). The oldest age group ranged in age from 9.8 to 13 years and consisted of 44 children (24 boys and 20 girls) (Brocki & Bohlin, 2006). Students were chosen from preschools and primary schools (notated as compulsory schools in Sweden) from various regions in the country. The outreach for student participants was completed through the postal mail system, and the parents were asked several questions related to their child's psychological and medical history. The parents were required to provide written consent, and the students had the opportunity to provide verbal consent for participation in the study. Sweden has a 9-year compulsory school mandate – and further education is considered a secondary education – up to 12 years. According to the study "…parental occupational levels were derived using a scale based on the Swedish educational system" (Brocki & Bohlin, G., 2006, p. 7).

Interestingly, there was a small percentage of the parents who only completed the 9-year compulsory education (8%); 58% of the parents had some vocational training; 22% of the parents completed secondary education (12 years); almost half of the parents earned a university degree; and 20% of the parents were Ph.D.'s (Brocki & Bohlin, 2006). All the selected students were tested individually in a room without noise-related distractions at their home school. The assessments were conducted during a 1.5-hour duration. The students were given a reward after the assessment "of a toy worth approximately $5 for their participation" (Brocki & Bohlin, 2006, p. 5).

The EF was tested, focusing on several factor areas: non-verbal working

memory, subjective sense of time, verbal fluency, inhibition response, and interference control.  Areas of ADHD and inattention and behavior issues were gathered from teachers utilizing the DSM-IV Criteria for ADHD. Many of the same target areas measured in this study were addressed in previous research (Becker & Langberg, 2013; Thorell, 2007); although, the altered variables from other comparable studies made the development of a sound finding difficult.

   In the findings from this study, Brocki and Bohlin emphasized a strong correlation between the lack of inhibition and the hyperactive/impulsivity and inattention traits of students. Additionally, the older age of students was also found to impact working memory and non-verbal working memory negatively.  Furthermore, the study indicated much of the students' internalizing of issues was magnified toward the symptoms related to deficits in working memory, verbal working memory, and fluency. Deficiencies in these three areas were likely to cause significantly higher levels of internalizing by the student.

   This study by Brocki and Bolin (2006) began to draw-down on the concept that working memory and fluency were key factors concerning a student's inattentiveness and the need to complete work within the older age group. A better understanding of these deficit areas may be an opportunity for some students to move toward higher academic achievement. Educators and medical professionals are gaining further understanding of each new piece of research conducted and serves students well.

### Description of the Intervention

   The researcher focused on the question:  What is the impact of the coexisting diagnoses of ADHD and Executive Function Deficits (EFD) for adolescent students in an academic setting and social setting? The research and intervention were based on a single participant (Z) case study senior in high school.

   The specific nature of this research predicates the need for individualized intervention.  As with any student with a diagnosis of ADHD, any intervention or teaching method attempted with the student is based on that student's specific needs and abilities. The intervention used with Z was based on researcher observations of the student in academic and social settings within the high school setting.  In addition, the researcher surveyed the student and the teachers who work with Z to develop an indication of the classroom and social interactions. The researcher observations and student and teacher surveys formed a baseline for the researcher to better understand the impact of the coexisting deficits and interventions. As a result, the researcher implemented evidence-based practices to aid Z in developing a pattern for positive academic and social interactions through the many settings beyond high school.

   The researcher observations and the participant and teacher surveys were based on a curriculum and surveys developed by the Rush Neurobehavioral Center in Skokie, IL. The curriculum for high school teachers and students, *Executive Functions Curriculum Notebook © 2010,* was purchased by the school district in an effort to better understand how EFD interact in students with diagnosed disabilities and those who are unidentified with other deficits. The curriculum has teacher and student materials that consist of an overview of the human brain, study strategies, goal setting, decision making and learning strategies, and personal surveys.  These materials were utilized with Z to understand how the student utilizes self-reflection, and how teachers view the student in

executive function (EF) areas in academic and social interactions in the high school setting.

The researcher would have preferred to provide examples of the student and teacher surveys and various components of the curriculum; however, permission is required from the publisher of the materials (School Specialty, Inc.) prior to any reproduction of the materials, with the exception of brief quotations in printed reviews.  It can be noted the materials in the curriculum are rather common sense in nature.  Moreover, many concepts and ideas are regularly implemented by teachers to help students who struggle with the EF skills.  The majority of these students receive accommodations based on their Individualized Education Plans (IEPs) and 504 plans.

The materials were reviewed with the student, and surveys were completed, and it became apparent that Z would need highly explicit instruction on a day-to-day basis.  Furthermore, in many instances, the instruction from the previous day would need to be retaught for the material to become part of Z's daily activities.

**Participant**

Z is 18 years old and lives with a biological father, stepmother, two younger brothers and a younger sister; and an older brother who attends college and does not live at the family home. Z's biological mother died within the past year, and this event weighs heavily on Z and causes some school interruptions. Z is a highly sociable young adult and enjoys connecting with other students and adults in a classroom and social setting. Those connections can be tenuous based on behaviors and comments; peers who are not familiar with this student will often make comments about the "strange" behaviors. Z has a self-stimulation manifestation that dates back to the earliest academic and social settings – Z will rock back-and-forth, much like parents of newborn babies. Z is completely unaware of this action – based on current and previous observations.  In addition, other students will text Z and ask to meet only to not show-up – Z is highly suggestive and somewhat gullible.  Z attends the same district where one of the biological parents attended – and has interacted with many grade-level peers since first grade.  This connection has proven highly beneficial for Z, even though some relationships are one-sided and superficial.

Evaluation results for Z indicate relative strengths in the areas of basic reading skills, reading fluency, spelling, and working memory.  Z demonstrates functional gross and fine motor skills and passed the latest vision and hearing screenings. Cognitively, Z's most recent performance on individual and group-administered assessments was below average.  Reading comprehension, math, and written expression skills are below the age and grade-level expectations.  However, positive progress is being made with intensive levels of intervention supports. The speech and language therapist report suggests that Z needs to continue working on appropriate social communication skills and appropriate classroom behavior within the natural environment.  Assessment of Z's social, emotional, and behavioral functioning revealed significant concerns in the home and school settings with regard to social relationships, executive function, attention, and hyperactivity that is likely associated with the clinical diagnosis of an Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD). Z's adaptive behavior levels are highly inconsistent across settings. Overall adaptive functioning is within expected limits at school, with relative weaknesses in functional academics and leisure activities. These diagnoses reported that Z reached the school-age designation for math and language arts.

Z has no medical or physical impairments, except for prescription glasses. Z takes medication daily to regulate the ADHD deficit at home.

**Setting**

   Z is a senior (12<sup>th</sup> grade) at a central Ohio high school that includes an approximate daily enrollment of 651 students in grades 9 – 12. The district is in an insulated community. A major metropolitan area surrounds the city. The school district is one of the major reasons why families with school-age children move to the community. Home values have remained relatively steady or increased during the most recent/current economic slowdown. The number of students who are considered economically disadvantaged continues to grow, as does the number of students diagnosed with disabilities.

**Data Collection**

   The intervention used with Z was based on researcher observations of the student in academic and social interactions within the high school setting. In addition, the researcher surveyed the student and the teachers who worked with Z to develop a sense of classroom and social interactions.

   Z completed several self-evaluation surveys that indicated a learning style and executive function "level." The information gathered from these reflection surveys from the student was invaluable. The surveys allowed the researcher to "see" into the student and develop questions and conclusions.

   The student surveys were completed within a 10-minute time frame to facilitate completion. The student was highly receptive to complete the survey versus the usual classwork as the survey was "new and different." Z enjoyed learning new information and sharing it with the researcher and teachers. Z accepted the survey questions in a hard copy format and achieved "success" in the completion of the surveys within the set time limit. Based on researcher and teacher observations, the student was less confident as the lone respondent (student) versus a multiple of students or test-takers. In several instances, Z made efforts to delay work or instruction in the intervention strategies by asking the researcher questions or making unsolicited comments related to other topics. These behaviors were noted as prevalent earlier in Z's academic career.

   It should be noted the researcher found the highest level of information and insight was gained through observations and direct contact with the student. Z was more than willing to share information regarding personal thoughts and actions. The researcher believed this willingness to share was based, in part, on the lack of a solid peer group or significant adult (Z mentioned on multiple occasions that home life was not positive and often was accused of all negative aspects within the family home).

<div align="center">

**Analysis**

</div>

   According to an individual learning survey, Z presented with the following major and minor learning styles. The major styles included the Auditory–Numerical, Tactile–Kinesthetic, and Social–Group. The minor learning styles included Auditory–Language and Expressiveness–Oral.

   According to the diagnostic definitions from this survey, Auditory-Numerical is based on the student learning from seeing numerals in any number of mediums such as

SmartBoard, paper, or chalkboard. It is the full concept of sight and cognition.  The student is more likely to understand math facts if he has seen them. The definition of the Tactile-Kinesthetic learning style is centered on the student learning best through experience and touch, sight, and sound.  This student works best when there are opportunities to touch and manipulate pieces. The third learning style Z scored high on was Social-Group, which has a working definition of the student searching for study groups and struggling with individual study or work completion. Two other areas registered for this student. It was in the minor learning style arena: Auditory –Language and Expressiveness – Oral.  The definition of Auditory-Language is centered on the student being comfortable when discussing his accumulated knowledge; and, the Expressive-Oral learning style centers on his ability to speak fluently with confidence and to demonstrate knowledge. The definitions for these two minor areas are significant in that they relate specifically to Z's weaknesses. He is not comfortable speaking in front of a group larger than one to two people (peers or adults) unless it is a familiar social setting. If not, Z will "freeze" and stammer to find an answer, and often distracts with behaviors to deflect the lack of an answer.  In addition, Z did not "like" attention to be focused on the answers or reactions/actions provided to the classroom environment.  Z will deflect that type of close examination or attention at every opportunity. He presents an interesting mix of abilities and interests. Z will eagerly accept invitations to meet during free periods or lunch and is disappointed and hurt when the person who offered the invitation was only interested in the ruse. Z will "forget" the incident and move forward with the day. However, the next time an invitation is offered, Z will eagerly accept, even though the last invitation ended in disappointment.

Z exhibited relative executive function strengths in Task Initiation, Response Inhibition, and Goal-directed Persistence. He exhibited relative weaknesses in Working Memory, Sustained Attention, Organization, Time Management, Flexibility, Planning and Prioritization, and Metacognition.  The researcher and teachers were specifically surprised that Z scored high in the area of task initiation. Observations and previous work history do not bear this out as a relative strength for Z; however, significant interventions have been attempted. Teacher survey results suggest relative executive function weaknesses in all of the areas noted by Z's self-evaluation. Z's teachers all remarked on the improvement they have seen in the amount of work completed and the higher work accuracy level.

A math teacher providing additional content supports for Z stated, "Z often shows an initial interest in new concepts but needs an explanation of how the skill can help in life outside of school." The researcher had the same observation and made explicit efforts to inform Z how the various intervention strategies could be applied outside of school. In conversations with Z's teachers and intervention specialist, the researcher found that all had similar thoughts regarding Z's behaviors and work effort as the academic year progressed. Z grew more anxious as efforts were being made to help prepare for graduation. The researcher asked a question specifically directed at this notion, and Z confirmed the anxiety and nervousness. The researcher indicated that each teacher working to help Z was doing so out of genuine affection and caring.

## Results and Discussion
The results for this case study revealed more data needed to be collected from Z

in his specific areas of executive functioning as it relates to academic and social activities. The researcher had envisioned a conclusive outcome based on the student's prior knowledge and the focused nature of the surveys, observations, and teacher interactions. The researcher also believed the occurrence of an ASD diagnosis for Z played a significant role in this case study's overall results.

However, at the conclusion of this research, it became apparent to the researcher that further investigation is necessary. A singular case study does not offer conclusive or even anecdotal evidence that would lead to a conclusion that could be used as a basis for other researchers to replicate. The lack of distinctive conclusions suggests other researchers should further investigate how executive functioning areas impact specific academic and social skills.  While this researcher's effort is inconclusive, it does not indicate there is not usable information available to other education professionals.

This researcher has found the development of a personal relationship with the student is of paramount importance. The student was familiar with the researcher, and that was a benefit in conducting this study. However, Z needed to become familiar and comfortable with a teacher before openness could occur. This student (and others with the same deficits) may require an extended introduction and learning time. Conclusions drawn from a study conducted by Johnson and Reid (2011) indicated the need for explicit instruction combined with practice and scaffolding.

Further instruction is necessary to help students with ADHD, with or without EFDs, in the skill of goal setting.  Goal setting can be a difficult skill to master for students without any discernable deficits. For students who already have difficulty adhering to a plan or approaching tasks in a systematic effort, goal setting may be outside of their skillset without continual reinforcement from the teacher. The study noted, "making goal setting an integral part of all assignments can help students with ADHD make goal setting habitual" (Johnson & Reid, 2011). Goal setting alone cannot be the end of the matter for students and teachers. A system for both the teacher and student to monitor progress toward goals is paramount. If goal setting is completed in a vacuum without continual checks or progress monitoring, the student may be unable to recognize the smaller or incremental accomplishments by getting "lost" within the larger goal of assignment completion. Goal setting and progress monitoring require the student to consciously document a change in their behavior(s) as it relates to the plan they developed. It is also imperative the teacher systematically gathers data on their performance. This record keeping allows both parties to celebrate the small successes and feel a sense of accomplishment as they work towards a larger goal. When there is a common goal, both the ADHD student and teacher can feel a sense of pride and accomplishment.

## Conclusion

This study's data does not fully detail the implications for the coexistence of the diagnoses between ADHD and EFD; however, there is a significant need for further research to determine the link between the apparent coexistence of ADHD and EFD in adolescent students in an academic and social setting. In the researcher's own experience, the academic and social settings are significantly linked for a student. Unfortunately, this study did not focus on that variable.  Though, the need for a student and researcher connection is paramount.

The academic setting must be understood so that students are able to be active in

the academic setting – with no difference in their level of desire to learn the content is integral for the future of the US education system.  The researcher believes the individual learning style surveys should be administered to all students in fourth or fifth grade, in seventh grade, and again at the beginning of high school. It might also be helpful for educators to administer various executive function surveys to students at the same grade ranges. These surveys would provide a greater degree of insight for teachers. Another mention of the conclusion drawn from an earlier referenced study bears repeating at this juncture of the discussion "it may be important for clinicians to evaluate executive functioning as part of a diagnostic evaluation of ADHD so that appropriate academic and remedial assistance can be provided" (Martel, Nikolas, & Nigg,  2007).

## Further Study

The data collected during this case study are not conclusive enough to prove a connection between ADHD and EFD and student learning styles. However, as teachers and school districts are being measured on all students' learning growth and ever-increasing test scores, this topic begs further research and understanding. The research and understanding are not only needed to propel students with these deficits into a higher scoring bracket but, rather, to aid in their instruction and later success in life outside of school. According to the Centers for Disease Control and Prevention (CDC), there is a continual upswing in the percentage of children diagnosed with ADHD year-over-year (2016). The percentage increase can be staggering – the number of children diagnosed aged 4-17 is considered to be almost 6.5 million as of 2011 – "rates of ADHD diagnosis increased an average of 3% per year from 1997 to 2006 and an average of approximately 5% per year from 2003 to 2011" (p. 1).

Prior research and current study results indicate skills other than those academic that are developed while students are in academic settings will carry on in life after graduation. This persistence is an indication there may be a connection between EFDs and socio-economic status.

Biederman et al. (2004) posited, if EFDs are in some manner determined by one or both parents, then that might indicate one or both parents also have some form of EFD, and this occurrence has hampered their academic and workforce success. The study mentioned did not focus on this potential, and so the suggestion is just another question added to the list from inclusive data or research design. Furthermore, additional research is needed on how educators and medical professionals collaborate to address the needs of students with ADHD and EFDs.  More specifically, data should be gathered from students with ADHD and EFD in various age groups in academic, leisure, and workforce environments. As with all concepts and best practices in education, the ethos of a student-centered approach must be a key component to any evaluation and intervention. The researcher believes there is a place for case study-oriented research; however, a more quantitative oriented study is indicated to more fully understand any relation between the coexisting deficits of ADHD and EFDs in academic and social settings.

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# Examining Theories which Support Online Learning: Ideas for a New Integrated Model

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## Abstract

A number of quality theories have been utilized to provide a framework or background for studies of online learning and instruction. While many of these theories have been useful, several have been modified as new technologies have been invented and adopted in schools. This paper examines some of the most prominent theories of online learning and hypothesizes a new model which better integrates many of the most recent technologies and understandings of how people learn in online environments.

**Keywords: Models of Online Learning, Online Instruction, Theory**

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## Introduction

The COVID-19 pandemic has impacted education across all levels of learning. For those teaching in colleges and universities across the nation, faculty were forced to move all face-to-face courses to an online only format in order the salvage the remaining five to six weeks of the spring term. Fortunately for college instructors, they have likely encountered some experience with teaching online as the popularity of online courses has increased significantly during the past decade (Lederman, 2019). Those teachers in K-12 classrooms, likely faced a much heavier lift for several reasons. First, very little K-12 schooling is done online, thus the move to online instruction left many teachers with little practical experience and uncertainty for where to start in order to migrate to a virtual learning environment. Secondly, when the pandemic hit, schools were in the middle of the third quarter, thus a significant portion of the school year was yet to come. Coupled with concerns over Advanced Placement and End of Course (EOC) testing, there was still a great deal of learning left to be achieved in most K-12 schools. Finally, and perhaps most importantly, K-12 teachers are primarily dealing with kids whose current grade level and courses serve as critical foundations for the following year. While college students might experience some holes in their learning, elementary student's as one example, may miss major learning benchmarks which could place their future education at considerable risk. While the plight of the different levels of instruction may have differing consequences, it is clear that the movement to online instruction caused a major disruption of learning across all levels of schooling.

Although we are still very early in understating the long-term consequences of the

pandemic's effect on education in the Unites States, some reports are beginning to surface which are revealing many deficiencies of schools and institutions as they worked to provide meaningful learning opportunities for their students. There is no doubt that all schools did their best to implement curriculum and material to support student learning, and the ultimate effectiveness will be a challenge to measure as we did not design a controlled experiment of student learning across the nation. Only time will tell what potential long-term negative impact that this had for our students. Perhaps adding more complexity to the problem, it has been reported that the implementation of online leaning has looked vastly different across the country and this suggests that not all students received the same type of instruction. This has the potential of enlarging the already too wide achievement gap.

   The first place that many educators would have looked for guidance in moving to online learning during the pandemic was likely the Internet. Of course, we know that virtually anything can be found in the web but deciphering the quality of that information is challenging. This is particularly the case when searching for things that we are not familiar with. As teachers, professors and district leaders began to search for support as they moved to online instruction, one common phrasing they likely sought out was "best practices for online instruction." Unfortunately, a recent google search turned up 394 million results, perhaps slightly more than a typical person can handle. Coupled with the overload of potential support via online searchers, districts also sent teachers links and books and articles, all with the intent of supporting teachers, but often simply overwhelming them. While the flood of resources may provide encouragement that some nuggets of information may be found, the time and expertise needed to find the best materials can be intimidating.

## Background Literature

### A Brief History of Online Learning

   The use of online learning as the primary avenue to educate students has a much longer history than most would expect. The first systematic efforts to conduct virtual instruction began in the 1950-60s when correspondence courses began as instructional materials were mailed to students. Later in 1984, General Electric, IBM and AT&T founded the National Technological University to provide videotaped courses to student's interested in engineering. The 1990s brought prominence to schools such as the University of Phoenix who became one of the first colleges to offer completely online programs, a move that was soon mirrored by other major institutions as the model for online learning began to become mainstream (Ceglie & Black, 2020). The most recent data from the National Center for Educational Statistics reports that there were nearly seven million students taking courses in degree granting postsecondary institutions in 2018. This finding highlights an astounding fact that nearly 70% of the current student population is enrolled in some type of online college level course (United States Department of Education, 2019).

   While these data provide some perspective regarding the prevalence of online learning in higher education, less is known regarding K-12 schooling. Forbes Magazine reports that over 2.7 million students are taking online courses within the K-12 school systems (Forbes, 2019). With roughly 57 million students attending K-12 in the United

States in 2019, this means that just under 5% of students are enrolled in online courses (Bustamante, 2019). This is a significant difference when comparing this to college course taking patterns. However, recent events, specifically the COVID-19 pandemic, is likely to lead to a significant change in the amount of online learning occurring in these levels of schools. In addition, while the prevalence of online learning may differ across all levels of schooling, a large percentage of this disparity is likely due to the age and maturity of those talking courses. We cannot expect a first grader to have the same levels of patience, persistence and motivation as a 20-year-old adult. Regardless of these differences, it is clear that more online learning will be found in future classes as this trend to online learning will continue to expand through the coming years.

**Research on Effective Technology Integration and Online Instruction**

The research on what exactly constitutes effective online instruction has an incomplete story. As the technology has continued to evolve over the past decades, this has placed educational researchers in the precarious position of attempting to study a moving target. We can start with the premise that online learning in many education settings is still a relatively new phenomena. Thus, before delving into a full exploration of online instruction, it is important to consider how technology integration has occurred in all educational settings. One of the most important "modern" technological tools utilized in today's classroom is the computer tablet. While desktop computers have been around for decades, more effective integrations of technological tools often necessitated mobile devices. In 2010, ipads were the hot new technology finding their way into classrooms across the county. Then, only a few years later, schools began buying Chromebooks because of their comparatively reduced cost. Today, cell phones are a necessary tool for virtually any student in middle school or high school. None of these tools have had enough time to be fully successfully implemented in schools and certainly none have a robust sound research conducted on them, as the shift to new technology and tools is occurring at a lightning pace While there are some quality studies regarding technology use, implementation, and effectiveness, it is important to note the caveat that this research base is not complete.

In one of the most comprehensive studies on the impact of technology on student learning, Tmaim, Bernard, Borokhovski, Amrami and Schmid (2011) conducted a metanalysis where they explored over forty years of research on educational technology. While this study does cover types of technology no longer used in today's schools, the findings illustrate the idea that instructional technology-based tools do support improved learning outcomes. Based on the 37 total studies that were analyzed, "a significant positive small to moderate effect size favoring the utilization of technology in the experimental condition over more traditional instruction" was found (p. 13). They conclude that the average student in a class that uses technology as a part of the class activities will perform 12 percentage points higher than the average student who does not use the same technology.

A review of the literature which explored the effectiveness of technology-based learning in higher education environments was completed in 2014. Kirkwood and Price (2014) examined studies conducted from 2005-2010 and included a total of 47 unique articles. In their analysis, they note that "The potential of technology to transform teaching and learning practices does not appear to have achieved substantial uptake, as

the majority of studies focused on reproducing or reinforcing existing practices" (p. 24). This points to the inherent difficulty in actually measuring achievement gains as they found inconsistent methods, assessment tools, and concerns of lack of theoretical underpinnings in many of these studies. There findings are consistent with other scholars who have expressed concern for how technology does improve learning outcomes in students (Cuban, 2001; Guri-Rosenbilt, 2009).

One important meta-analysis conducted by Zheng, Warschauer, Lin and Chang (2016) aimed to understand how laptop use, both in and out of class impacted learning. Their study reviewed 65 journal articles, and 32 doctoral dissertations published between 2001 and 2015. The focused on ten specific studies and focused on an exploration of the impact of one-to-one laptop programs. As the digital divide is potentially reduced across the county, a one-to-one student to device ratio is becoming a reality. While this includes devices supplied by the schools and those owned by students, it better represents what many schools are moving toward or have already achieved both in and out of the brick and mortar walls of the school building. The researchers found a small positive effect size of .16. While this result is positive, they note that

> Though our analysis corroborates and extends many of the positive conclusions from earlier syntheses of one-to-one computing, it is far from the last word on this topic, in part because a disproportionate amount of the research to date on this topic consists of small case studies in one or a handful of schools. The number of studies identified that deployed rigorous experimental or quasi-experimental methods was small, making meta-analysis difficult, and making it impossible for us to conduct moderator analyses. In addition, studies on this topic have largely done a poor job of assessing learning outcomes that are not well-captured by current iterations of standardized tests. (p. 1076)

Research which specifically examines what effect mobile devices such as laptops and cell phones have at improving learning outcomes were examined in a research synthesis by Sung, Chang and Lui (2016). Since the use of laptops, smartphones and tablets serve as the foundation for online learning as well as many applications to in-class technology-rich activities, studies that explore their use is a valuable contribution. Sung and colleagues started their analysis by limiting studies to experimental and quasi-experimental studies and found 110 such studies conducted from 1993-2013. Similar to what was found by Tmaim, Bernard, Borokhovski, Amrami and Schmid, their analysis found a moderate mean effect size of .523. In the conclusion, the authors note that there was a range of effects based on different devices used, how they were implemented, and what learning goals were aimed to address. The explained

> we find our analysis corroborates and extends many of the positive conclusions from earlier syntheses of one-to-one computing, it is far from the last word on this topic, in part because a disproportionate amount of the research to date on this topic consists of small case studies in one or a handful of schools. (p. 1076)

Transitioning to online instruction research, studies focused on the impact of online instruction as an effective delivery method for teaching have not reached

consensus as there are not enough quality-controlled studies. There is evidence that online instruction can be just as effective as face-to-face learning, but caution must be used because of the limits of the current research base. Regarding K-12 instruction, the United States Department of Education (DOE) conducted a meta-analysis in 2010. They found that on average, those who engaged in online instruction, "performed modesty better than those receiving face-to face instruction" (US DOE, 2010, p. ix). In conclusion, they warn that the number of studies available was small. Perhaps more importantly, there are virtually no systematic or meta-analysis studies on online learning at the K-12 schools since this DOE report.

   Online learning at the college level has a more robust research base. A Brookings research study examined the impact of online study on college students attending DeVry University. In one of the largest studies available, they obtained data from over 230,000 students enrolled in 168,000 sessions of more than 750 different courses at DeVry. Since the DeVry courses are offered both in person and online, this provided one of the best comparisons of the types of learning available. They found that taking a course online reduces a student's grade point average (GPA) by .44 points (Bettinger & Loeb, 2017). In addition, taking a course online reduces a student's GPA by .15 point in the following term. They also found that taking a course online, instead of face-to-face increases the likelihood that a student will drop out of school. Students are approximately 9% less likely to be enrolled in college the semester following a student taking an online course. While some caution must be used with this study as it is limited to only one institution, the sheer number of data available in the study provides some compelling evidence to question online learning's effectiveness.

   A recent report conducted by Spiros Protopsaltis, director of the Center for Education Policy and Evaluation at George Mason University and former aide in the Obama administrations Education Department, and Sandy Baum, a fellow at the Urban Institute and professor emerita of economics at Skidmore College, examined the impact of online courses on socioeconomic and racial achievement gaps. The study (2019) found that while online education is the fastest growing segment of higher education, it is not meeting the needs of all students. They conclude that "The consensus that emerges is that learning outcomes appear to be the same as in traditional courses" (p. 14). However, they found that students labeled as underprepared and economically disadvantaged underperform, in addition, achievement gaps between them and their peers is wider for online learning platforms. This work is consistent with the Bettinger and Loeb's research and does not provide a positive portrayal of online learning in colleges and universities. Where there have been some smaller studies that do challenge these studies (e.g. Shea & Bidjerano, 2014) it appears that much of the online learning research has focused on areas other than student outcomes and thus mixed results have become the status quo for these types of studies.

   Collectively, this survey of studies related to technology integration and online learning provide support that technology *can* have a positive effect on student learning, although there is just as much evidence for the contrary. While this isn't the most optimistic finding, as the use of technological-based tools is ubiquitous in today's schools, it clearly demonstrates that more focused research is necessary. In cases where positive achievement was demonstrated, we have evidence that if utilized appropriately, technology can be used to provide similar student outcomes in online settings. One major

challenge is that the pace that new hardware and software is being used and replaced adds additional impediments in measuring the exact impact of any one tool. The consensus is that we need more systemic research but measuring the impact of a changing landscape will continue to be a major obstacle. Regardless of the critiques, there does appear to be some clear benefit of technology and its use for learning, however, we also know that the implementation and effective use of these tools can vary across different environments.

**Theories Supporting Effective Online Learning**

One potential impediment to successfully employing technology in today's learning environments is a clear understanding of how learning theories apply to technology-based practices. As noted above, one challenge to studying effective online learning is that many studies lack a clear theoretical foundation, This is unfortunate, as there are numerous learning theories that are applicable to the 21$^{st}$ century learner, and many of which are very applicable to online learning. Perhaps the best synthesis of research on learning was conducted by Bransford, Brown and Cocking in their book *How People Learn* (2000). In this synthesis, the authors suggest that there are three key findings that have impactions for teaching. First, that students come to school with preconceptions for how the world works and if their initial ideas are not engaged, they often fail to grasp new material and in many cases, return to their original faulty conceptions. The origination of these early ideas is not particularly important, rather having opportunities to challenge them provides long-term understanding. Second, in order to master material, students must have a deep foundation of factual knowledge, understand these facts in the context of some conceptual framework, and must be able to organize knowledge in ways that facilitate retrieval and application. The memorization of discrete disconnected facts does not lead to meaningful learning. Having a deep understanding with a supported framework for information allows the learner to connect and synthesize new information and ultimately allows them to apply these understandings to new situations. Thirdly, there is a high value is using a metacognitive approach to learning as this can help students take ownership in their learning. This leads to the creation of learning goals and links with self-regulated or monitoring of their own learning progress. Taken together, these three ideas serve as the best research-based evidence for how to support the most favorable learning outcomes.

These findings have clear application and connections to the latest research and integrate areas such as psychology, neuroscience, biology, anthropology and other disciplines. These three areas demonstrate a consistency with sociocultural theories which have been heavily utilized in the 21$^{st}$ century which emphasize that we are social beings, and this plays an important role in our education. The integration of metacognitive approaches is consistent with the most recent efforts by educators to help students be more flexible and cognizant of their own thinking. The implementation of self-regulation is also apparent and aligns nicely with some of the emergent technology tools where personalized learning can be achieved with the implementation of computer software.

As we enter the golden age of online learning and the heavily technologically enhanced instructional methods become more common, we are left to consider how Bransford, Brown and Cocking's work will apply to that instruction. Online learning theories have been consistently evolving in response to the ways that the technology has

evolved. One of the most widely applied learning theories is behaviorism, which suggests that learners respond to environmental stimuli and that an individual's behavior is either positively or negatively reinforced by the outcomes. These reinforcements then influence future learning as behaviors are acquired, reinforced, or deterred, thus, influencing future learning experiences (Skinner, 1938). With respect to online learning, the use of "rewards" and "punishments" can often be observed for how feedback and assessment methods work. Providing positive feedback to students, and in best case received in quick fashion, promotes future learning and engagement. Online software often utilizes tools which can provide immediate feedback, something that may be harder in a face-to-face environment. This can serve to correct and direct learning in ways that build confidence and support in the learner. Constructivist learning theory evolved through work by Piaget and Vygotsky as they applied new understandings for how the cognitive processes work. This theory supports the idea that learners gain knowledge and skill through active engagement in educational activities. While Dewey is often credited with early thoughts on hands-on and inquiry models of instruction, his work parallels constructivist ideas. Collectively, constructivist ideas support the notion that learning is an adaptive activity which has clear applications for online learning (Boethel & Dimock, 2000). Adding the social domain to this and we have social constructivist learning theory which stresses the importance of social activities to learning. Social learning theory posits that knowledge and skill is constructed as learners engage in activities, receive peer and instructor feedback, and participate in related interactions in a social context (Henning, 2004). This theory has a strong application to the type of online learning design which is used. In a fully asynchronous course design with little peer-to-peer interaction, social interaction is limited. However, courses which may utilize synchronous learning and supports peer-to-peer interactions lends themselves well aligned with this theory.

Two other important theories make strong contributions to understanding how students learn within online environments. Alfred Bandura (1993) championed the importance that self-efficacy has on learning. His work indicates that one's self-efficacy influences the likelihood in participating and remaining engaged with learning tasks. Online learning activities which reinforce the growth and confidence of the learner build these skills in an accumulative fashion. On the contrary, "If an individual believes that he/she cannot achieve the results, they will not make any effort to make things happen" (Alqurashi, 2016, p. 45). This applies to both the course content and the design of a course. Should a course be poorly designed and foster anxiety and frustration in the learner, then the quality of the content will likely be tarnished. The role that motivation has in learning is strongly correlated with self-efficacy beliefs. A strong motivation on the learner's part is correlated with course retention, persistence, and satisfaction (Chen & Jang, 2010). Motivation as applied to online learning, supports the need to build course content and delivery which is interesting, engaging, and applicable to the learner. In addition, the environment, both the social environment and course layout are also factors which can support motivation and the learning outcomes in an online course. One application of motivation is self-determination theory which has been studied using the foundational work by Deci and Ryan (1985). Self-determination theory is an umbrella framework for several underling factors which contribute to human motivation. This theory postulates that and individual's experiences and motivation are influenced by the degree of one's autonomy, competence, and connection. Deci and Ryan see these three

factors as psychological needs that when met, can lead to positive learning outcomes. For online learning, these motivation factors can be inhibited or supported based on both intrinsic and extrinsic factors. Design factors such as opportunities to build connectedness and social interactions, as well as positive feedback experiences will support stronger learning. The learning can be mediated through increased course engagement, opportunities for satisfaction, and evidence of achievement.

One final appliable theory for effective technology integration and meaningful online learning relates to the importance of sense of community which is fostered in most successful learning environments. Etienne Wenger (1999) pioneered this idea as an attempt to conceptualize four critical elements which serve at the foundation for social learning and include 1) identity, 2) meaning, 3) practice, and 4) community. Communities of practice are built as learners work together to make meaning as they interact and collaborate on shared activities. While communities of practice are not essential for online learning, research suggests that they can help mimic the face-to-face classroom environment and support learners enrolled in online coursework (Lai, Pratt, Anderson, & Stigter, 2006; Smith, Hayes, & Shea, 2017).

One offshoot of the work by Wenger focuses on how an individual can become engaged in the larger online social community in a course. Sense of belonging (SoB) which can be defined as acceptance and value experienced by an individual where they become connected to a given experience. This concept has been increasingly utilized but one of the first important studies was conducted by Sylvia Hurtado and Deborah Carter (1997), where they found that a strong sense of belonging was associated with positive outcomes for Latino college students. The concept of sense of belonging is also consistent with the pioneering research on academic progress and college student attrition by Vincent Tinto (1997). In fact, Tinto highlighted the importance of community building in his research on face-to-face learning environments. The application to online learning is clear when one considers how instructors integrate current technology tools to build an inclusive, and supportive communities of learners in online courses. These communities are facilitated by the instructor who serves as a mediator and designs learning activities that engage the students in active and socially based learning experiences. One important part of these communities is a successful building of a sense of belonging (SoB) on the part of the learner. Work by Peacock and Cowan (2019) supports the idea that effective learning in online platforms are largely dependent on one's ability to feel a part of the community of learners. They note "Educational research suggests that students who feel accepted and valued, that they are important to the life and activity of the class, develop a strong SoB, which is important for all" (p. 78). Other studies have also found that a strong sense of belonging is also valued by learners which in turn leads to improved learning experiences within their online courses (Thomas, Herbert & Teras, 2014).

There are certainly other theories which have applications to technology use and online instruction, but the collective list described above is a culmination of those that have the strongest research foundation. Collectively, these theories provide many different starting points for exploring learning. Some theories focus more on the design of a course while others highlight the type of experiences that are practiced by a learner. The intent here was to be inclusive to theories which would apply to how technology can be implemented in a classroom while at the same time focusing on the actual experiences of a learner enrolled in an online course. None of these theories were specifically designed

to help explain online instruction or technology integration, rather they are theories that one would expect are applied in any online or technology specific learning theory or framework.

It can be hypothesized that any framework which is reported to support online learning would utilize one or more or the previous mentioned theories to serve as its foundation. Perhaps the most appropriate place to begin any discussion of theories of online learning would begin by reviewing the TPACK framework. TPACK or technological pedagogical content knowledge is an application of Shulman's (1986) pedagogical content knowledge work. The key distinction is the addition of technology and how technology can be meaningfully integrated into other content areas. This framework is predicated on a consistent understanding of pedagogical content knowledge. In Figure 1, a presentation of TPACK  depicted which shows that technological knowledge (TK) must integrate with the content (CK) and pedagogy (PK) that are unique to any specific comtent area.

**Figure 1**
*TPACK Framework.* Reproduced by permission from tpack.org (2012).
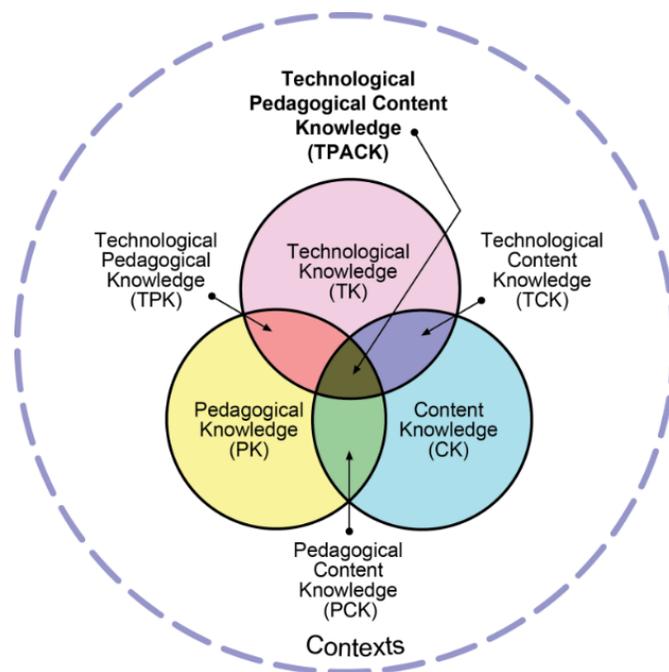


While this model for integrating technology is a useful tool to remind curriculum designers and teachers of the interplay of these understandings of learning, many of the research studies which explore this model only focus on how teachers utilize or integrate technology. Only limited research has examined how this model is appropriate for guiding online instruction (e.g. Ward & Benson, 2010). Given its use in so many studies on technology, it would be expected that it could apply in some way to how information is understood in an online environment.  Although numerous studies use the TPACK framework, several studies have questioned its true value. Graham, Borup and Smith (2012) question the unnecessary complexity and uncertainly in the current TPACK

framework and state that it "adds a significant level of complexity to the already complex PCK framework by more than doubling the number of framework constructs (from three in PCK to seven in TPACK)" (p. 4). While there exists many studies which have successfully applied the framework, there is still uncertainty in creating a precise definition for this framework and its seven knowledge constructs which have been outlined (Graham, 2011). Yet despite this large body of work, it appears as though little progress has been made towards providing either a simple, precise definition of the TPACK framework or developing a robust way to measure it (Graham, 2011). In addition, although the original framework was intended for teacher educators, it's been applied across many areas and in numerous surveys. Brantley-Dias and Ertmer (2013) question the use of TPACK and "suggest that the construct, as it currently exists, is both too vague and too intricate." They believe there is value in the model but "additional clarification and conversation is needed to adequately guide future educational efforts aimed at preparing both teachers and students for the 21st century" (p. 123). It is expected that this framework will continue to have value, other ideas which better align to online learning have been postulated.

One of the simpler models for online learning was created by Garrison, Anderson, and Archer (2000) and they refer to it as the Community of Inquiry Model and is depicted in Figure 2. This model has clear links to social constructivist theories as it hinges on the idea of several elements of "presence" which are integrated to build a learning experience. This model suggests the importance of the teacher to facilitate a supportive environment. This idea connected with work by Wenger with the emphasis on community building. The second presence presented here is the social presence, which is built by the learners in concert with the teacher. Finally, cognitive presence which hinges upon an understanding of the content which aligns with the Bransford, Brown and Cocking work. One of the highlights of this model is that is has clear emphasis on the type of interactions which can occur in an online course. For example, sharing of ideas via a teacher facilitated discussion board or through group meetings would contribute to the learning experience as one integrates the appropriate content. However, it is also suggestive that a class without these features would be less effective to building the learning experience. This does not negate teacher or social presence, but one might consider if an effective online experience can occur devoid on one of these. One could argue that online courses originated without much social presence and many continue to do so even today.

**Figure 2**
*Community of Inquiry Model.* Redrawn from original in Garrison, D. R., Anderson, T., and Archer, W. (2000)
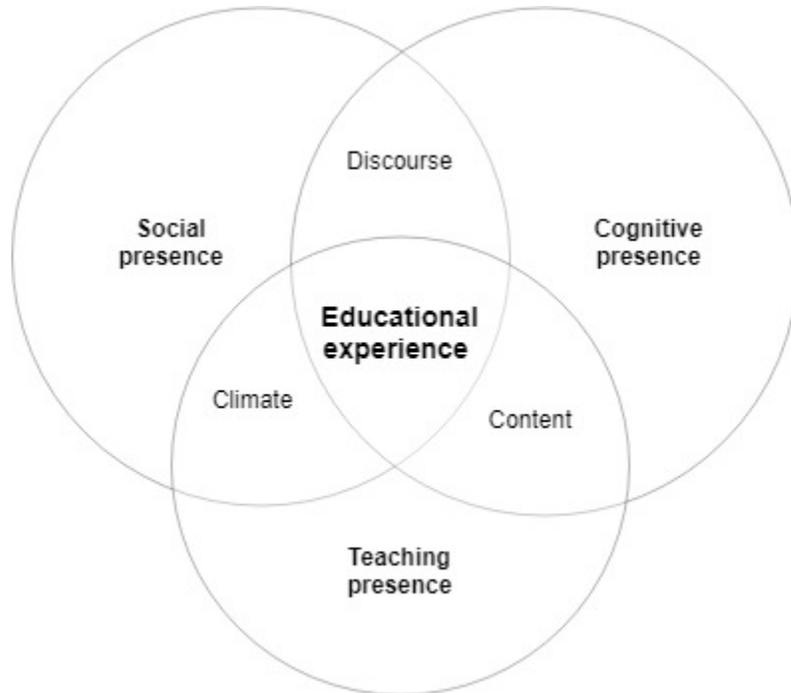


An extension of this work can be observed in more recent work by Terry Anderson (2011) in a paper where he discusses the feasibility of creating an inclusive theory of online learning. In his theory discussion, he calls attention to several of the key pieces from the Bransford, Brown, and Cocking (1999) study which provides the foundation of his ideas. He suggests that a theory should be learner-centered, knowledge-centered, assessment-centered, and community-centered and he argues that these align well with prior research. In addition, he expresses that the type of interaction that occurs within an online course is critical to create an effective learning environment, something which we have seen in social learning theory. In Andersons' model, he integrates the interactions that exist between leaners, teachers, and content and examines how these interactions exist in an online environment. Simply described as an Online Learning Model is depicted in Figure 3, it places the content at the center with the student and teacher at opposing ends both interacting with content and each other. Another strength in this model is that is embeds some of the most common tools used on online courses such as simulations, virtual activities, and various forms of communication. This model also embeds the community of inquiry idea presented earlier. It is important to consider how much of this model hinges on the learning resources and activities which must be designed to meet the needs for this type of learning. The new tools such as simulations, video instruction, and "just in time" content, and other support afforded by emergent technologies, allow for a much richer and personal learning experience for the learner and mimics what can be done in a face-to-face environment. In conclusion Anderson explains

Our challenge as theory builders and online practitioners is to delineate which modes, methods, activities, and actors are most effective, in terms of cost and learning, in creating and distributing quality e-learning programs. The creation of a model is often the first step toward the development of a theory. The model presented illustrates most of the key variables that interact to create online educational experiences and contexts. The next step is to theorize and measure the direction and magnitude of the effect of each of these variables on relevant outcome variables, including learning, cost, completion, and satisfaction. (p.55)

**Figure 3**
*Anderson's Online Learning Model*. Reprinted with permission by Anderson, T. (2011).
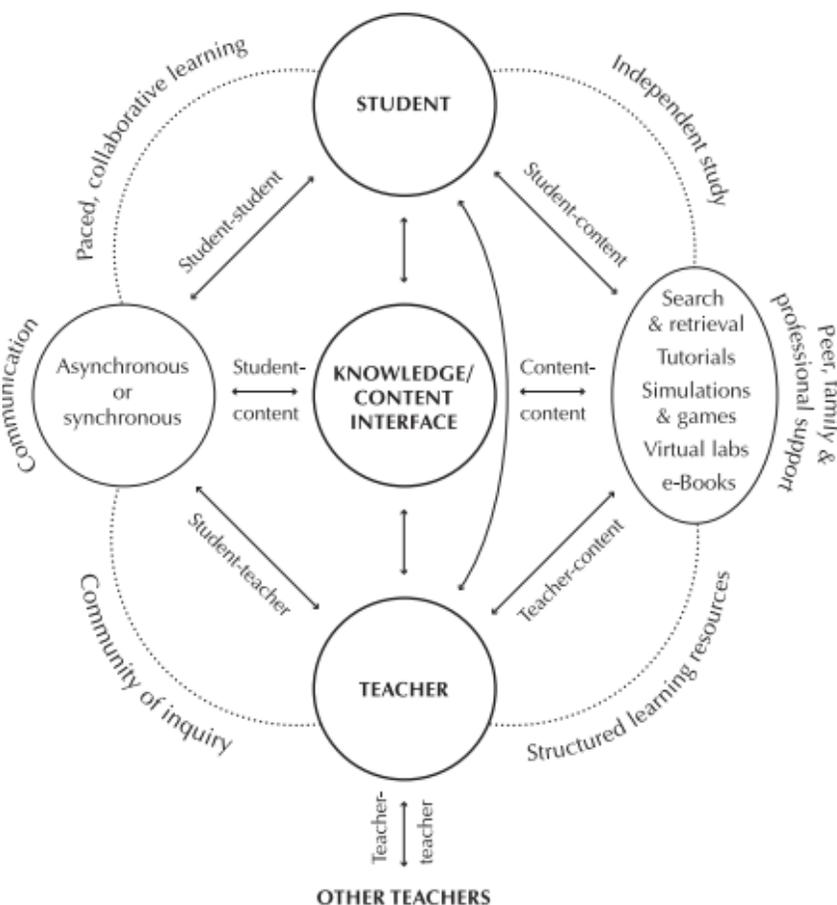


One potential weakness in this model is that it assumes all interactions occur in the virtual environment and that hybrid learning is not taken into consideration (Picciano, 2017). While this does not negate Anderson's work, some more recent studies have explored how this can be integrated into a blended online learning theory which incorporates fully online and hybrid environments as a more thorough integration of synchronous and asynchronous learning. Shea and Bidjerano (2010) tackled blended learning theory using a combination of theories related to self-efficacy and self-

regulation. In this study, they take a step back from Anderson's current work and return to the community of inquiry model and apply this to blended learning environments. In their view, self-efficacy is the medium between teaching, social, and community presence as depicted in Figure 2. Although their final model looks very similar to the original community of inquiry framework, a consideration of a more expanded view of online learning is worthy of consideration, as their study is significant. Their work employed data from over 3000 students who had recently enrolled in at least one online course and is one of the larger studies of online learning.

One more recent attempt at a unifying model of online learning is an adaptation of Anderson's model, termed the Multimodal Model for Online Education, which was put forth by Anthony Picciano (2017). This model as depicted in Figure 4 and provides a more practical framework for online instruction.

**Figure 4**
*Multimodal Model for Online Education.* Reprinted with permission, Picciano (2017).
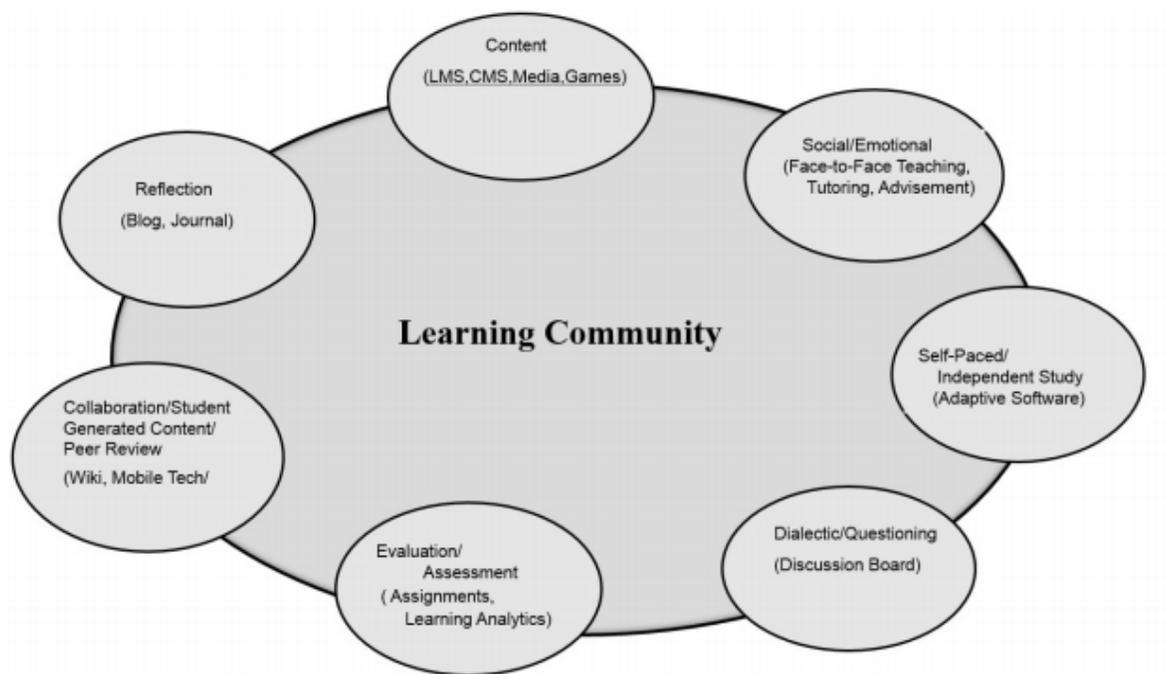


Picciano notes that this model is founded on the work of blended learning technology, generations, personality types, learning styles, and cognitive science. It recommends that pedagogical objectives and activities should drive the approaches that faculty use in instruction. Picciano also suggests that combining the objectives, activities, and approaches within multiple modalities might be most effective for and appeal to a wide range of students (Picciano, 2009). However, a glance of the visual representation of the model suggests that this is a very modest framework and much of it simply displays the connection of learning activities typically found online and how they all integrate to build an effective learning community. If viewed as a practical framework for

instruction, it does provide some guidance for those curriculum designers, even with the lack of depth. In addition, unlike Anderson's model, this allows for blended and hybrid approaches to online learning, thus it serves a greater range of needs.

One final model of online learning is very recent work by Borup, Graham, West, Archambault and Spring (2020). In their article, they put forward the Academic Communities of Engagement (ACE) framework. The background of this framework is taken from Vygotsky's work on zones of proximal development. The model "describes a student's ability to engage affectively, behaviorally, and cognitively in an online or blended course independently and with support" (p. 807). Figure 5 provides one depiction of the ACE framework, although the article provides many other representations of the relationships that emerge. In fact, many of these figures are quite in depth which may be a way to help explain relationships, but it becomes difficult to visualize them in a simplistic model. The authors note that

> The ACE framework provides a useful perspective for viewing blended and online learning contexts. Considering a learning environment, a scholar can apply the ACE framework structure to analyze personal and course communities and the levels of support provided by each. (p. 823)

**Figure 5**
*Representation of ACE Model*. Redrawn from Borup, Graham, West, Archambault and Spring (2020).
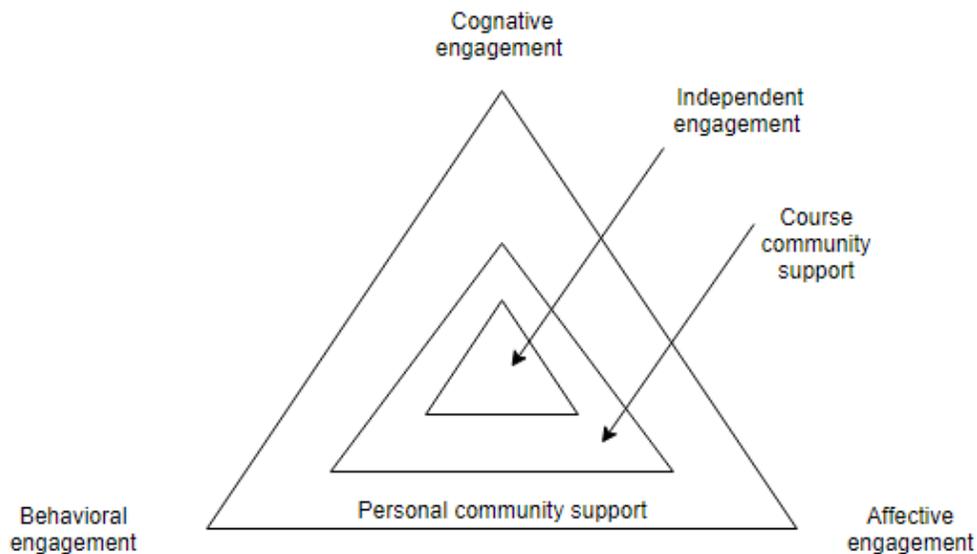


This analysis of course communities is supported later when they explain "This framework represents a conceptual understanding of the forms of support necessary to promote students' academic success as well as the communities that can provide them" (p. 827). Taken at face value, this model offers us a more complex representation of the supports needed to ensure student success. However, one could argue that the complexity of the various components presented in the paper are hard to conceptualize. In addition, unlike other models, there is a lack of clear connection to the technology tools and

content is largely absent and this has not yet been applied in any other studies.

## Moving Forward

Collectively, the theories and frameworks presented here are some of the most widely cited and referenced tools used to support the theoretical construct or a model for online learning. A challenge with any online theory is the pace at which online learning evolves. Every few years new tools become available and utilized, and often times they replace hardware or software which was never empirically evaluated. A new theory for online learning must be broad enough to encompass the relevant learning theories while at the same time be agile to be adapted for new technology tools and practices as they emerge. While the current theories all provide important elements, which can be used in designing online instruction, it is also clear that new or revised theories are becoming used and then thrown out as newer ideas are put forth. A useful exercise is to examine the common elements of the aforementioned theories and test their alignment with the relevant learning theories which are utilized in effective learning environments.

Figure 6 depicts a qualitative comparison of the major learning theories with the previously described online learning theories. To add to the theories, two columns were added which focus on the emphasis of content and technological tools, as those are important factors to consider in any theory. While this depiction is not meant to be a quantitative evaluation of any theory, it does provide an indication of which theories align with the different overarching learning theories. Based on this comparison, it is clear that the ACE model and Anderson's model for online learning embed the most comprehensive learning theories. Perhaps these two theories provide different guidance based on what specific elements of online learning one is evaluating. Additionally, conceivably a different model would offer a more flexible framework and integrate all the various aspects. For example, the ACE model as depicted in the triangle, but this makes it difficult to conceptualize the underpinning ideas which are absent in the model. In addition, it is difficult to determine where content and tools intersect with this model. As noted earlier, Anderson's model relies heavily on online learning and does it pay much homage to self-efficacy. One consideration when evaluating these models is to explore how well they are actually employed by teachers and other educators who design or implement curriculum.

**Figure 6**

*Comparison of Learning Theories and Online Models*

| | | Learning theories, Content and Tools | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Social construc-tivism | Self -efficacy | Motiva-tion and self-determin-ation | Bransford, Brown and Cocking | Comm-unity of practice | Sense of belonging | Focus on content | Focus on tools |
| **Online learning model/theory** | TPACK | | | | X | | | XX | X |
| | Comm-unity of inquiry | X | | X | X | XX | X | | X |
| | Andersen online learning model | X | | X | XX | XX | X | X | X |
| | Multi-modal model for online education | X | | | X | XX | X | | XX |
| | ACE model | X | X | X | X | XX | X | | X |

Key:  X= minor emphasis, XX= major emphasis

Efforts to design a framework which encompasses the most relevant learning theories and online learning frameworks appears to be something that is becoming more common as several of the previously described frameworks have been proposed in the past decade. It would be expected that a formal presentation and eventual acceptance of a new framework would need to be vetted by other experts in the field and later empirically evaluated if possible. What follows in Figure 7 is a proposed draft on an integrated online learning framework as a first start at aligning the relevant current theories into one cohesive model.

**Figure 7**
*Integrated model of online learning*
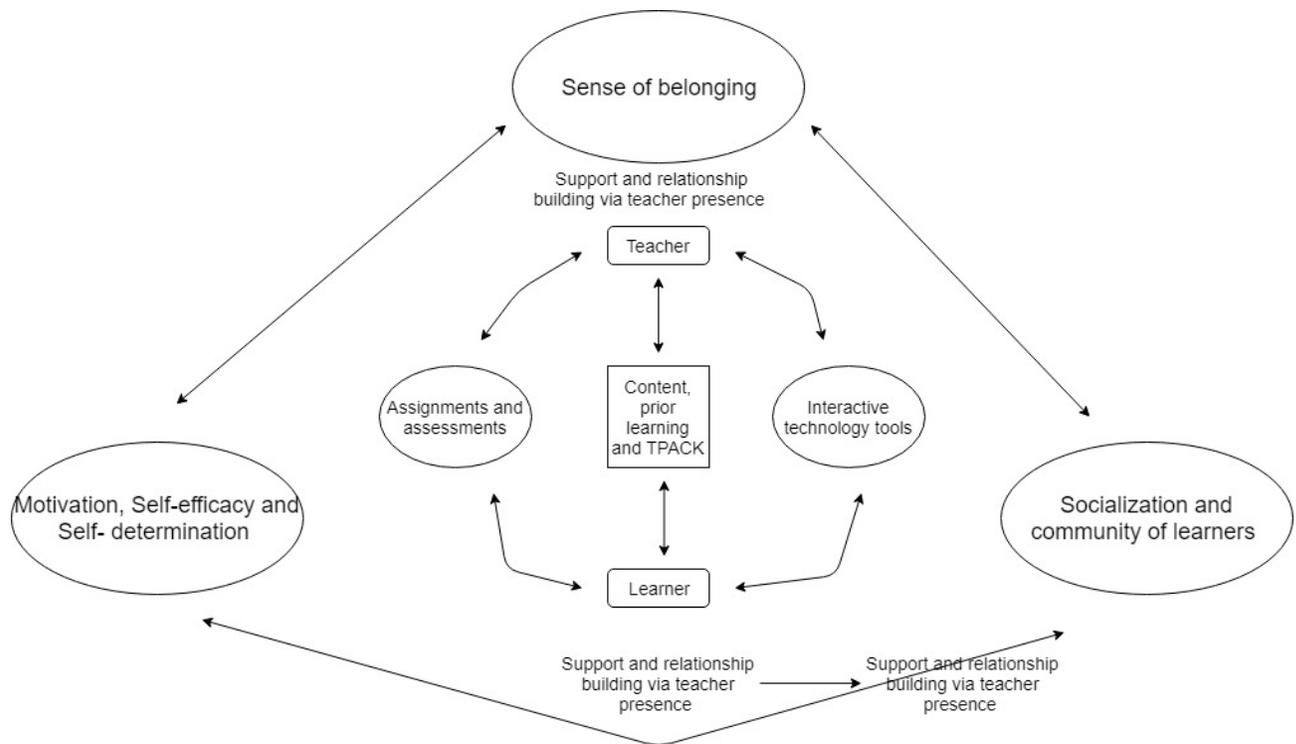


This model places the content and ideas related to TPACK and content knowledge expertise at the center, which is immediately flanked by the teacher and learner. As the learner is the one interacting with the content, knowledge, and skills attained in a course, and the teacher is delivering these, it is logical to have them at the heart of any model. Considering the methods used in an online course to promote the content, the learning activities and assessments built into a course are central to the achieved objectives. In addition, the types of interactive activities and engaging technology-based tools which online learning provides are interrelated. These serve as the primary vehicles for the consumption of the knowledge and skills. Thus, the center of this framework is primarily related to the content and the technology-based tools which are utilized by the learner. On the periphery of the model, lie three of the most relevant categories which appear to impact effective learning environments in online settings. The community of learners and socialization of an individual in a course is fostered through the course design and content and also connects with the communication and community building within a course. Motivation, self-efficacy, and self-determination are theories related to persistence and course completion and they strongly correlate with effective learning environments. Research is strong on how a teacher has the ability to support a strong sense of belonging and this would be true in an online course. What surrounds these three outer bubbles is a reminder that "support and relationship building via teacher presence" activities within a course help bind those ideas and support a positive learning environment.

## Conclusion

The examination of research-based learning theories and their application and integration into online learning frameworks suggest different levels of alignment. Since a growing body of research supports the importance of the affective domains of learning, theories which utilize community building, teacher presence and supports motivation, engagement, and sense of belonging are highly valued in any comprehensive online learning framework. The current theories and frameworks for online instruction have offered guidance as the online learning environment has evolved, but teachers also need a practical-based model which encompasses the latest and best ideas as to what leads to effective online environments to support learning. The proposed framework is a draft of a more integrated model which is flexible but also inclusive of the best learning theories. Next steps are to explore in what ways this framework can be tested in real learning environments. Application of this model will allow us to continue to refine these theories and better support teachers and curriculum designers who work in educating students in online environments.

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# Pre-Service Educators and Professional Development on LGBTQ Youth in Higher Education

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School leaders are charged with the duty to create a school climate that is safe, welcoming, positive, and protective of all, including LGBTQ students. In order for LGBTQ students to be fully included and affirmed in their schools, administrators need opportunities to learn about and recognize the need for a continuous process of interrupting the systematic exclusion and stigmatization of LGBTQ students in all arenas of school life: curriculum, social culture, policy, extracurricular activities, school ceremonies, and rituals (Payne & Smith, 2017). Few teacher preparation programs in the United States include LGBTQ issues as required coursework for future teachers (Macgillivray & Jennings, 2008) and no state requires LGBTQ multicultural competence to qualify for teacher certification. There, too, is little research on in-service professional development (Towery, 2007) and even less on the efficacy of school-based interventions in support of LGBTQ students. The education a pre-service educator receives is crucial to not only their success, but the success of their students. Though pre-service teachers who don't obtain professional development on students who identify as LGBTQ prior to entering the classroom, are not able to serve their students fully.

According to Jennings' (2012) examination of formal curriculum for 55 public universities school leadership graduate programs, 59.5% of programs do not include sexual orientation. And the bigger issue is that pre-service preparation programs don't require LGBTQ professional development. The most frequently reported reason for the omission was that accreditation agencies do not require it (Payne & Smith, 2017). Teachers cite their preparation programs as not training them to address such topics in school (Kearns, Mitton-Kukner & Tompkins, 2014). Programs that did include sexual orientation ranked it as their lowest "diversity" priority, and Jennings determined that "both non-[LGBT] inclusive programs and [LGBT-] inclusive programs ranked sexual orientation so low as to be statistically indistinguishable from one another" (p. 10). Teachers' self-reported of being unprepared to address LGBTQ bullying during their teacher education programs (e.g., Gay & Kirkland, 2003; Jennings & Sherwin, 2008; Mathison, 1998). If teacher education programs continue to send pre-service instructors into the field without this knowledge base, creating a safe space for all students becomes difficult.

With little or no preparation during their pre-service programs (Athanases & Larrabee, 2003; Macgillivray & Jennings, 2008; Sherwin & Jennings, 2006) and with little opportunity for professional development (Payne & Smith, 2010), one may conclude that educators' inability to effectively address homophobia and heterosexism is closely tied to a lack of education. Gay and Kirkland (2003) discussed the importance of developing "culturally critical consciousness and self-reflective teachers" (p. 181), who are aware of the diverse lives their students live, and could reflect on the impact of power and privilege within the curriculum, in the hopes to strive for improvement. This calls for

teachers to be better prepared in addressing bullying, even towards marginalized groups, notably, LGBTQ youth (Milburn & Palladino, 2012).

New teachers graduate from their teacher education programs without the appropriate knowledge and skills to be the effective allies their students were looking for (Milburn & Palladino, 2012). Pre-service programs can no longer rely on their prospective school districts for guidance on LGBTQ youth. Many teachers have also noted a general lack of resources and understanding of the topic to address LGBTQ bullying in their respective schools (Birkett, Espelage, & Koenig, 2009; Ginsberg, 1998; Goodenow, Szalacha, & Westheimer, 2006; Grossman & D'Augelli, 2006; Mathison, 1998). The deficit in knowledge, perhaps ignored in their teacher education programs, has left teachers feeling unable to be successful in navigating LGBTQ bullying and harassment situations (Milburn & Palladino, 2012).

While in their teacher education programs, preservice teachers are commonly asked to "describe the ideal classroom." For example, Hall (2006) found responses to such a prompt to be consistent in the push to create, "clean, colorful, bright, safe, spacious, welcoming, intellectual, nurturing, respectful, humorous, understanding, encouraging, fun and fair" (p. 149) classrooms and schools. Yet, the reality for many of our LGBTQ and gender nonconforming students is a school environment that they attend on a day-to-day basis that is the opposite of the above desired traits (Milburn & Palladino, 2012) because of the lack of preparedness of their instructors.

Teacher education programs address various forms of diversity, yet the attention to sexual orientation and gender identity topics are often absent or de-emphasized (Jennings & Sherwin, 2008). Many teachers rely on the knowledge and skills obtained through their teacher preparation programs to address issues and concerns in their classrooms and schools (Milburn & Palladino, 2012). When teacher preparation programs fail to address a portion of students, a change needs to be made in the pursuit of providing all students with a safe and successful place to learn (Milburn & Palladino, 2012). Szalacha (2003) found that unless a student knew a particular teacher who was proactive on issues of tolerance and inclusivity, students were unaware of any professional development their teachers had, and teacher training alone did not produce a significant effect on school climate.

The importance of including LGBTQ in higher education programs (Goldstein, Russell, & Daley, 2007; Kitchen & Bellini, 2012; Taylor et al., 2009, 2011) are critical as many future teachers are not prepared to address LGBTQ youth. The opportunity for teacher candidates to understand how to incorporate anti-discrimination work in their teaching practice is a key component of school and education reform (Kearns, Mitton-Kukner & Tompkins, 2014). Social justice policies and procedures exist in many school settings, but unless new teachers have the opportunity to explore and apply their grounded knowledge from professional development, these well-meaning policies are often neglected or ignored (Kearns, Mitton-Kukner & Tompkins, 2014).

In conclusion, there needs to be a development of pedagogy that does not oppress; one that truly embraces, celebrates, and honors all learners (Kearns, Mitton-Kukner & Tompkins, 2014) on "issues of homophobia and heterosexism in the classroom" (Stiegler, 2008, p. 117). Teacher educators need to prepare pre-service teachers to understand their role in the development of inclusive spaces for sexual minority, transgender, and gender non-conforming youth in schools (Kearns, Mitton-Kukner & Tompkins, 2017).

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**Safe Spaces for All**

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One pertinent problem facing public high school principals: how best to provide inclusion and protection of LGBTQ youth from homophobic bullying and victimization. The secondary school campus is often a hostile and lonely environment for many of the nation's 12% of middle and high school level LGBTQ students (Kosciw et al., 2014) who are frequent targets of school-based victimization ranging from seeing or hearing antigay epithets to physical abuse (Toomey et al., 2010). Little empirical research specifically addresses school administrators' efforts to create more inclusive school environments for LGBTQ students (Tooms & Alston, 2006). Educational leaders rarely receive any formal training in their preparation programs on LGBTQ educational topics (Hernandez & Fraynd, 2012; Jennings, 2012).

De Palazoo, the Safe Schools Director of Equality Action Inc. Florida in Orlando, FL described the "reactiveness of principals when realizing the importance of creating a safe space" as a characteristic of principal leadership with LGBTQ youth.

> I found a lot of principals before the school districts started providing some form of professional development took it upon themselves to have gender neutral bathrooms, creating GSA clubs. Though I think principals need to be think about intersectionality, think about what the challenges in our school that we can address that are intersectional that that focus on our LGBT youth but also focusing on our youth of color and our needs in the country.

Educational leaders do not typically receive training related to transgender youth (O'Malley & Capper, 2015) and educators express fear about working with transgender students and potential backlash from the school community (Payne & Smith, 2017). LGBTQ students have reported that the most frequent response by teachers, staff, or administrators to student disclosure of sexual orientation or gender expression based victimization was inaction or an ineffective response to the reported incident (Burwick et al., 2014; Kosciw et al., 2014).

Palazoo expounded on "how effectiveness begins with the students "and "detrimental lack of knowledge of GSAs" can be on LGBTQ youth in reply to best practices when establishing a GSA to reduce rates of LGBTQ peer victimization.

> The lack of knowledge pertaining to how life affirming, and lifesaving gay straight alliance needs more education. There is definitely a lack of knowledge about how critical it is to have a gay straight alliance To say there is a lack of a deep ethical interest in supporting GSA by supporting them by making sure that they're in every school and by making sure that they're active,  they just don't have two or three or four members, they are resourced with the appropriate resources materials etc. to be able to shine. From day one, and that means not completely run by seniors so that when seniors graduate there are freshman and sophomore and junior and that will help lead the club. It's critical that the GSA is supported

with regular resources and materials. You create a path of sustainability to ensure that GSAs stay  networked with each other so they're not in a silos(within the school district).

Furthermore, the  Safe Schools State Director of Equality Florida, Inc. suggested the following in GSA formation and sustainability as a safe space for LGBTQ youth. There must be a systematic support of the GSA to ensure that they are supported, active and resourced in their district. This includes professional development training for Gay Straight Alliance adult advisors. In other words, how to run a GSA or how to help guide students who are running a GSA. District wide professional development and district wide LGBTQ cultural competency professional development means from directors to school bus drivers and everyone in between. Second, training specifically around Trans and gender nonconforming youth support and assistance with youth support professional development for and around transgender and gender nonconforming youth needs. The third would be a rollout to the district with a LGBTQ critical support guide. Additionally, a GSA Student Leadership Summit, where students from all GSA come together for a daylong training, camaraderie building and student training that's home led by students and adults. And lastly specific mental health counseling, specifically related to LGBTQ young people. These mental health counseling groups usually run once a week, in school, catering to gay youth and their unique challenges and troubles they may face…

In conclusion, schools are lacking comprehensive anti-bullying/harassment policy that specifically included protections based on sexual orientation and gender identity for LGBTQ students (Kosciw et al., 2018).  With LGBTQ youth being bullied on elevated levels than their heterosexual peers, school administrators are finding the necessity for programs such as GSAs to inform, include and deter students from harassing their LGBTQ peers. There is a need for systemic policy reform that challenges and deconstructs heteronormative structures can promote acceptance of sexuality-based diversity and sustain a safe and inclusive environment that endures beyond changes in student populations, educational leaders, and school personnel (Fetner & Kush, 2008; Mayberry et al., 2011; Ouellett, 1996; Payne & Smith, 2010a).

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