

INVESTIGATING THE RELATIONSHIP BETWEEN
STUDENT PERCEPTIONS OF NEEDS SUPPORT
AND A BLENDED LEARNING CLASSROOM

By

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Abstract: Motivation is a critical element to academic success. According to Self-Determination Theory, motivation can be increased when three psychological needs (competence, relatedness, and autonomy) are met, and the fulfillment of these needs rely heavily on the environment in which they are fostered. This research study was performed in an effort to provide insight into the relationship between student perceptions of needs support and perceived effectiveness of a blended classroom. This study surveyed 9th grade students ($N = 113$) at the end of the academic year after having experienced a blended learning approach in an Algebra 1 class. Using likert-type scales and open-ended questions, correlation analyses and content analysis were employed. Findings revealed a positive relationship between perceived needs support and effectiveness of blended learning. Responses to open-ended questions offered insight into this significant relationship, as students reported self-pacing and teacher availability as features of blended learning that contributed to their feelings of needs support. Results provided insight into how teachers can support students' psychological needs and an idea for the type of environment in which these needs can be supported. Limitations and future directions are also discussed.

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CHAPTER I

INTRODUCTION

Student motivation is at the heart of academic success and is one of the most critical predictors of academic achievement (Ryan & Deci, 2017; Taylor et al., 2014). A multitude of studies have confirmed positive associations between intrinsic motivation and academic achievement, prompting researchers to examine the factors that lead to increased motivation. Ryan and Deci's (2017) Self-Determination Theory (SDT) offers some insight, claiming that intrinsic motivation can be increased when one's psychological needs for competence, relatedness, and autonomy are fulfilled. The degree to which these needs are fulfilled can largely depend on the context or environment in which one learns (Ryan & Deci, 2016). In school, teachers have the power to influence the fulfillment of those needs by their pedagogical approach and classroom structure. The need-supportive conditions within these contexts help dictate the level of intrinsic motivation in students (Ryan & Deci, 2017). However, prior studies have provided evidence that motivation steadily declines over the school years, especially as students transition into secondary school (Gillet et al., 2012; Gnambs & Hanfstingl, 2016). Ryan and Deci (2017) claim these declines could be attributed to "insufficient satisfied needs" within their school environments (p. 356).

Some learning environments lend themselves to need-supportive conditions more than others. For instance, over the last several years, online and blended learning environments have emerged as an educational trend, where instruction is delivered all online

or with a mixture of online/computer-mediated and face-to-face instruction, respectively (Means et al., 2013). Within a blended learning classroom, opportunities for need satisfaction are seemingly more available because of its student-centered, flexible, and collaborative design (Sergis et al., 2018). Although some studies have found a positive correlation between need fulfillment and increased motivation within traditional classrooms, research is lacking with respect to a blended learning model (Aelterman et al., 2014; Stroet et al., 2013). Further exploration of this topic could guide and support teachers in developing a classroom that enhances student motivation, thereby increasing opportunities for academic success.

Problem Statement

Motivation is one of the most influential factors in a student's educational career and can predict the level to which one succeeds academically. Students with low motivation often lack interest or have feelings of incompetence and tend to experience lower academic achievement. By contrast, students have greater levels of engagement and experience higher academic achievement when their level of motivation is high (Ryan & Deci, 2017; Taylor et al., 2014). A greater understanding of the effects of the learning environment in which that motivation is fostered is a critical area to investigate, especially as students transition to secondary classrooms. SDT offers a framework for increasing motivation by supporting three psychological needs and emphasizes the influence of the environment on that support. As blended learning environments have become more prevalent due to the COVID-19 pandemic, further research is warranted to determine its effectiveness and the potential benefits of its implementation. These findings provide insight to students' perceptions of their experiences in a blended learning environment which can help educators better leverage the advantages of blended learning in ways that support students' needs and motivation.

Purpose Statement

The purpose of this study was to determine if there is a relationship between students' perceptions of needs support and the effectiveness of a blended learning classroom. I surveyed ninth-grade students' perceptions of the degree to which they felt their basic needs of autonomy, competency, and relatedness were being met. The survey also measured students' perceptions of the effectiveness of the blended learning classroom. Including open-ended questions provided potential insight into the features of the blended learning classroom that may have influenced their perceptions of needs support.

Definition of Terms

Self-determination Theory: By emphasizing the role of social-contextual factors, this theory describes how fulfillment of three basic needs (competence, relatedness, autonomy) affect motivation and well-being (Ryan & Deci, 2017). According to Ryan & Deci (2017) these needs are defined as follows:

Competence: The need to feel effective and successful.

Relatedness: The need to feel a sense of belonging/connection and care.

Autonomy: The need to feel a sense of volition or self-regulation.

Extrinsic Motivation: Based on a consequence or external reward.

Intrinsic Motivation: Based on interest or genuine feelings of enjoyment.

Blended Learning: Instructional model that eliminates lectures, and combines online and face-to-face learning (Smith & Suzuki, 2014).

Conclusion

As previously explained, student motivation decreases when students transition to the secondary level. Blended learning environments may allow the teacher to support students'

basic psychological needs, however more research is needed before actionable steps can be taken. Chapter Two will present an overview of Self-Determination Theory, how teachers support psychological needs, the effects of that needs support, and the features and outcomes regarding blended learning. Chapter Three describes the methodology for determining the relationship between perceived needs support and perceived effectiveness of blended learning. Chapter Four provides the results of quantitative and qualitative analyses, and Chapter Five provides interpretation of those results as well as limitations, suggestions for future research, and considerations for implementation.

CHAPTER II

REVIEW OF LITERATURE

In this chapter, I review literature that explains Self-Determination Theory, how teachers provide needs support, the effects of needs support, and the components and outcomes of blended learning.

Self-Determination Theory

Self-Determination Theory (SDT) is a psychological theory of development and motivation (Deci & Ryan, 2008). According to Ryan and Deci (2000), this theory posits that people have a natural inclination, or *intrinsic motivation*, to develop their well-being through learning, exploration, and mastery. People who are intrinsically motivated possess an inherent, autonomous desire to engage in behaviors or tasks based on their own interest or enjoyment. However, sometimes people must engage in tasks they do not find enjoyable. In this case, they are extrinsically motivated and typically driven by an external, more controlling force (Kaplan & Patrick, 2016). Kaplan and Patrick (2016) explain that extrinsic motivation can shift toward a more autonomous motivation when one finds usefulness or value, resulting in internalization. Ryan and Deci (2017) define internalization as “the process of taking in values, beliefs, or behavioral regulations from external sources and transforming them into one’s own” (p. 180). For example, a student might not find mathematics interesting, but if they are able to recognize its relevance to their future career,

they are more likely to internalize the motivation. Although that motivation is not intrinsically driven, the engagement is autonomous, and thereby more internal.

SDT claims that both intrinsic motivation and the autonomous forms of extrinsic motivation are enhanced when three psychological needs are supported: competence, relatedness, and autonomy (Deci & Ryan, 2008; Ryan & Deci, 2017). The theory focuses on how social-contextual factors influence one's motivation or well-being through the fulfillment of these needs. Ryan and Deci (2017) describe these needs as "essential nutrients," claiming that the satisfaction or deprivation of them can affect one's "psychological interest, development, and wellness" (p. 10). Ryan and Deci (2017) define competence as one's need to feel both capable and successful. Without competence, one might feel inadequate and limited by what they think they can or cannot accomplish. Relatedness refers to one's need to feel connected to and cared for by others. It also refers to a sense of belonging and contribution among others. Autonomy is one's need to feel a sense of volition and agency when engaging in certain types of behavior. However, autonomy does not equate to independence. Instead, autonomy relates to the initiative taken based on personal interests and goals

The degree to which these needs are satisfied depends largely on the environment and its level of support. School is considered one of the environmental factors in which students' needs can either be satisfied or unfulfilled, particularly within the classroom setting (Ryan & Deci, 2017). Teachers have the opportunity to structure their classrooms, behaviors, or teaching styles in a way that promotes or decreases competence, autonomy, and relatedness. Creating a need-supportive environment can lead to many beneficial outcomes for students including increased motivation, engagement, functioning, and academic achievement

(Aelterman et al., 2014; Ryan & Deci, 2017; Stroet et al., 2015). The following section discusses how teachers can support psychological needs in the classroom.

How Teachers Support Needs

Supporting Competence

Stroet and colleagues (2013) claim that students' feelings of competence are reinforced when teachers provide a structure in which students can exercise and stretch their capabilities and feel successful doing so. According to Jang et al. (2010), "structure refers to the amount and clarity of information that teachers provide to students about expectations and ways of effectively achieving desired educational outcomes" (p. 589). Specifically, Stroet and colleagues (2013) suggest four components that contribute to structure: clarity, guidance, encouragement, and feedback. Teachers offer clarity by creating a learning environment that is clear and consistent, communicating explicit directions and/or expectations that students can follow. In order to be successful, students need to know how or know what is required of them to do that. Teachers offer guidance by providing scaffolding and appropriate support, monitoring students and adjusting based on their needs, as well as being available to answer questions about the task or content. Teachers can encourage students by providing positive expectations and a non-competitive environment, reinforcing the idea that success is dependent on controllable effort and the idea that one can always improve. Along with encouragement, teachers provide constructive, informational feedback that focuses on improvement rather than performance, fostering students' sense of control over outcomes because they are now knowledgeable of the steps necessary to be successful (Stroet et al., 2013).

According to Jang and colleagues (2010) and Reeve and Halusic (2009), when teachers practice these four components and provide structure, they help their students recognize the relationship between their behaviors and the outcomes so their students can better regulate themselves and be more successful. With the support of a structured learning environment, teachers are giving their students the opportunities and the tools or guidance necessary to experience success, thus increasing their sense of effectiveness and competence (Stroet et al., 2013).

Supporting Relatedness

The need for relatedness is often associated with a sense of connection or involvement and a “desire to form and maintain strong and stable interpersonal relationships” (Stroet et al., 2013, p. 68). SDT researchers claim that this need can be supported through teacher-student relationships and/or through a sense of belongingness in the classroom (Stroet et al., 2013; Stroet et al., 2015). According to Stroet and colleagues (2013), teacher-student relationships at the secondary level can be harder to maintain, but teachers are still able to support this need for relatedness through a sense of involvement in their students’ lives. They describe four ways in which teachers can express this involvement: affection, attunement, dedicating resources, and dependability. Stroet et al. (2015) explain that teachers display affection by warm interactions with students that demonstrate a sense of connectedness and/or genuine interest. Affection is also displayed when teachers communicate that the student is important to them and treat them equally. Teachers express attunement by understanding their students’ needs, listening to their perspectives, and valuing their opinions. Teachers dedicate resources and show dependability by committing to and investing time in their students, whether that time is spent learning more about the

student or being available to answer questions (Stroet et al., 2015). Overall, when teachers express genuine care towards their students and make them feel valued, their sense of relatedness and feelings of belongingness are enhanced (Stroet et al., 2013).

Supporting Autonomy

According to Reeve and Cheon (2021), supporting autonomy begins with adopting a student-focused attitude and an interpersonal tone of understanding. When teachers embrace this attitude, they maintain an openness and flexibility to students' interests and preferences, prioritizing students' wants or needs before their own, whereas having an interpersonal tone involves showing understanding towards students' concerns and needs in an effort to help them succeed. Once a student-focused and interpersonal tone of understanding has been established, autonomy-supportive instructional behaviors can be practiced more readily. Reeve and Cheon (2021) discuss seven such behaviors: (a) taking the students' perspective, (b) inviting students to pursue their interests, (c) presenting learning activities in need-satisfying ways, (d) providing explanatory rationales, (e) acknowledging negative feelings, (f) relying on invitational language, and (g) displaying patience. Although these behaviors co-occur, the ability to take the student's perspective is considered a critical first step, serving as a catalyst of sorts for the other six instructional behaviors (Reeve & Cheon, 2021; Ryan & Deci, 2017). Teachers do this by "de-prioritiz[ing] his or her own perspective to attend more to the students' perspectives and concerns" (Reeve & Cheon, 2021, p. 57).

Instructors can consider their students' perspectives in several ways, both formally and informally. For example, they might have students fill out an exit ticket with reactions or suggestions related to the lesson or instruction, or they might ask students for input before, during, or after a lesson. Reeve and Jang (2006) also indicate that teachers can utilize

perspective-taking statements when communicating with students. Doing this gives teachers informative feedback that helps them understand their students' thoughts and helps their students feel heard. Reeve and Cheon (2021) state, "Perspective taking both readies and then enables the teacher to support students' intrinsic motivation and internalizations" (p. 56). To support intrinsic motivation, teachers design learning activities that give students opportunities to explore and pursue their interests and support their individual needs (Reeve & Cheon, 2021, p. 57). The literature also refers to these behaviors as nurturing inner motivational resources (Kaplan & Patrick, 2016; Reeve, 2009). Doing this involves "gaining an awareness of what inner resources students possess and then finding a way during instruction to involve, nurture and develop those resources" (Reeve, 2009, p. 168), hence the importance of first being able to take the students' perspective and listen to their wants/needs. Once a teacher has this awareness, they can create activities that appeal to student interests and goals, which then encourages them to engage based on their own desire to do so. Teachers might also offer choice within these activities to enhance their students' sense of autonomy. When students are able to make a competent choice, they often feel a sense of volition (or autonomy support) because they made their choice based on their own interests, values, or goals.

Of the seven behaviors, Reeve and Cheon (2021) identify four autonomy-supportive behaviors that cultivate internalization, or a sense of motivation when activities are not inherently motivating or interesting to students: provide explanatory rationales, acknowledge negative feelings, rely on invitational language, and display patience. Utilizing explanatory rationales help students identify why putting forth effort toward an uninteresting activity might be worth it to *them*. Additionally, when negative feelings arise, teachers can improve

internalization by acknowledging and accepting those feelings. Doing this allows teachers to validate students' feelings and reframe or restructure activities in a way that helps students find value in the activity. Another practice that can mitigate negative feelings or problematic behaviors can be to use invitational language. To do this, teachers avoid controlling phrases and instead use informational language that "preserv[es] the student's ownership over the behavior change and personal agency for solving the problem" (Reeve & Cheon, 2021, p. 58). Lastly, teachers can display patience, allowing students to think and work at their own pace. Instead of offering unsolicited help, teachers give students time to explore and revise their work, and wait to offer assistance until it is needed (Kaplan & Patrick, 2016). In summary, once teachers adopt a student-centered mindset, they can support autonomy by being responsive to students' needs and interests, offering opportunities for students to maintain choice and volition (Reeve & Cheon, 2021).

Effects of Needs Support

These three psychological needs are interdependent and share much of the same satisfaction criteria. Ryan and Deci (2017) describe autonomy as "a vehicle through which the organization of personality proceeds and through which other psychological needs are actualized" (p. 97). When autonomy support is present, competence and relatedness are also supported due to the interdependency of the three needs. The previous literature indicates seven practices associated with autonomy support, many of which echo the practices associated with competence and relatedness. For example, autonomy support, in particular, entails (but is not limited to) listening to/valuing student perspectives (which supports relatedness) and providing structure that allows for student choice and regulation (which supports competence). Furthermore, student-perceived positive correlations among the three

dimensions of SDT, indicate a gradual, interdependent relationship between them (Leenknecht et al., 2017; Wang et al., 2019). Because of the symbiotic relationship these three needs share, one could assume that when the need for autonomy is satisfied, the needs for competence and relatedness are more likely to be satisfied as well (Jang et al., 2010; Reeve, 2009; Reeve & Jang, 2006; Stroet et al., 2013).

The satisfaction of these needs can yield a variety of positive outcomes. SDT claims increased autonomous motivation as an initial outcome of needs support (Deci & Ryan, 2000; Ryan & Deci, 2017). Accompanied with that motivation is engagement. Jang et al. (2010) describe engagement as “a behavioral pathway through which students’ motivational processes contribute to their subsequent learning and development” (p. 588). By possessing autonomous motivation, students are also more willing to engage in learning activities (even the ones less interesting to them) because their teachers have helped them find value in those activities through supporting their psychological needs (Kaplan & Patrick, 2016). A review of 71 empirical studies revealed positive associations between need-supportive teaching practices (providing choice, feedback, affection) and students’ motivation and engagement (Stroet et al., 2013). Jang et al. (2010) cited similar findings, naming autonomy and structure support as predictors of student engagement.

With increased motivation and engagement, higher achievement is an associated outcome, especially when need-supportive teaching is present (Domen et al., 2020). Taylor et al. (2014) supported the ideas of SDT with their findings that indicated a positive association between intrinsic motivation/identified regulation and school achievement. Their research also revealed intrinsic motivation as a predictor of academic achievement over time in both high school and university students. Taylor et al. (2014) explain, “a student who goes to

school because he enjoys learning new things and is stimulated by his accomplishments will be more likely to work harder to receive better grades, and want to stay in school” (p. 355). Froiland and Worrell (2016) also found support for the positive influence of intrinsic motivation, revealing “an indirect positive association with GPA via engagement” (p. 331). Similarly, Leenknecht et al. (2017) found a positive relationship between need-supportive teaching and achievement, indicating higher GPAs for students who perceived higher levels of needs support.

Blended Learning

Features of a Blended Learning Environment

According to self-determination researchers, learning environments play a critical role in the level to which needs are supported (Ryan & Deci, 2017). One type of learning environment that has recently become more prevalent is blended learning. Blended learning is an instructional model that combines face-to-face learning with computer-mediated instruction (Means et al., 2013). While many definitions exist that incorporate specific ratios of face-to-face and online instruction to qualify as a blended learning approach, Dziuban et al. (2004) suggest emphasis should be placed on “the effectiveness and socialization opportunities of the classroom with the technologically enhanced active learning possibilities of the online environment, rather than a ratio of delivery modalities” (p. 3). For the purposes of this study, I align closely with the definition given by Smith and Suzuki (2014), identifying “embedded blended learning” as an approach that eliminates the live-lecture and replaces it with “embedded multimedia” created by the instructor, supporting a self-paced framework (p. 135).

Blended learning combines elements of traditional and online pedagogies to provide a learning environment that is interactive, flexible, and student-centered. Setyaningrum (2018) explains, “Those who use blended learning environments are trying to maximize the benefits of both face-to-face and online methods-using the web for what it does best and using class time for what it does best” (p. 245). Namely, blended learning eliminates the traditional time-consuming lecture and often replaces it with online video instruction (Smith & Suzuki, 2014). The elimination of this component alone changes the dynamic of the classroom and the student learning experience. Without a lecture, class time is increased and students have more flexibility and control of how they use their time. There are many advantages to incorporating the blended learning structure into the classroom, including increased student autonomy, teacher availability for personal feedback, and student-centered instruction.

Multiple studies have cited student control over pacing as one of the greatest advantages of blended learning (Setyaningrum, 2018; Smith & Suzuki, 2014; Vaughan, 2007; Zaka, 2013). By receiving instruction through online videos, students can pause, rewind, or rewatch, which allows them to move at a pace in which they are comfortable to learn and work in a way that accommodates their cognitive ability (Bhagat et al., 2016; Smith & Suzuki, 2014). Students do not have to worry about keeping up with their teacher or peers, giving them the time they need to truly understand and grasp the material. Smith and Suzuki (2014) compared instruction delivered through embedded blended learning or live-lecture and found that the students receiving blended learning reported positive perceptions and mentioned control of pace, specifically. One student from their study reported improvement in their learning, saying, “I think it did because I got to take my time to understand each thing she was saying while taking my notes” (Smith & Suzuki, 2014, p. 141). The flexibility of

self-pacing also brings about a greater accessibility to the material, as students are not limited to a one-time lecture. For example, students who are absent can access the lessons without having to find a time for the teacher to re-teach them. Furthermore, higher achieving students can potentially work ahead and not be held back by the pace of the teacher or their classmates. On the other hand, students needing additional review can rewatch the videos or ask their teacher for help more easily because they are not busy lecturing.

A blended learning classroom also brings about a new role for the teacher (Smith & Suzuki, 2014; Sohrabi & Iraj, 2016). Without spending a large portion of class time in front of students teaching, teachers have more opportunities to work with students individually and provide them with meaningful feedback as they are learning (Setyaningrum, 2018; Smith & Suzuki, 2014). Smith and Suzuki (2014) described responses from student interviews mentioning teachers being more available for questions and one-on-one help compared to a traditional classroom. One student was cited saying, “If we still didn’t understand it the teacher would be free because she wasn’t teaching the lesson” (Smith & Suzuki, 2014, p. 141). With increased availability and decreased whole-group teaching, teachers in a blended learning environment now act as facilitators, allowing their students to be the center of their own learning experience.

Student-centered learning is another associated element of blended learning (Bhagat et al., 2016; Sohrabi & Iraj, 2016; Zaka, 2013). Sohrabi and Iraj (2016) define student-centered learning as a “shift [in] focus and responsibility of learning from educators to students...learning is an active contextualized process of constructing the knowledge rather than acquiring it” (p. 515). In a blended learning classroom, students are encouraged to exercise their autonomy and take control of their learning experience. They have the

opportunities to make decisions that affect them directly. They are not limited to learning through a “transmissive experience,” but are active participants with the opportunity to shape “the creation and dissemination of knowledge” (Abeysekera & Dawson, 2014, p. 13). Again, with the additional time afforded by lecture elimination, students are able to take part in more meaningful learning activities that offer collaborative interaction - another key component of blended learning (Poirier et al., 2019). Whether it be teacher-student interaction or student-student interaction, Poirier et al. (2019) state, “the interaction between learners in a group enhances understanding and influences cognitive ability” and helps to create a “learning community” (p. 4).

Outcomes of Blended Learning

All of these features can contribute to one’s psychological needs. As stated earlier in the literature, competence is one’s need to feel capable and successful; relatedness is one’s need to feel connected or a sense of belonging; and autonomy is one’s need to feel a sense of volition or agency (Ryan & Deci, 2017). Deci and Ryan (2008) claim that one’s environment is an influential factor that can help or hinder the satisfaction of one’s needs.

The autonomous nature of the components of a blended learning model contribute to an environment in which psychological needs can be supported (Abeysekera & Dawson, 2014; Sergis et al., 2018). According to Sergis et al. (2018), results indicated that a flipped classroom model “provided a nurturing environment” for the fulfillment of competence, relatedness, and autonomy (p. 374). While this study focuses on a blended learning model, claims made in regard to a flipped model are comparable because of the similarity of characteristics (i.e., the elimination of live lectures). Sergis et al. (2018) explain how a flipped model contributes to support of each psychological need. Their research claims that

competence is supported through feedback and scaffolding provided by the teacher, as well as through the opportunities for collaborative activities. Being able to work alongside peers with the guidance of their teacher contributed to feelings of competence, as students had the confidence and support necessary to be successful. Students' need for relatedness was also fulfilled through this collaboration and assistance by allowing them to feel a sense of involvement and support within their classroom. Finally, autonomy was supported through the features mentioned above with addition to their role in the learning process, which was not restricted by "teacher-led lecturing" (Sergis et al., 2018, p. 375). In other words, the environment created by a blended learning model is one in which students can feel successful, connected, and autonomous due to the flexible, student-centered approach.

In studies comparing blended learning with a traditional format, students have shown a preference for blended learning and cited flexibility, convenience, and control of pace as their main reasons. Student choice, independent learning, and increased engagement/motivation were also contributing factors to this preference (Poirier et al., 2019; Setyaningrum, 2018; Smith & Suzuki, 2014; Vaughan, 2007; Zaka, 2013). In a meta-analysis reviewing 45 studies, Means et al. (2013) found that, on average, students receiving blended learning instruction "performed modestly better than those receiving face-to-face instruction" (p. 2). Their research also revealed common elements associated with blended learning instruction such as increased learning time, collaborative activities, and integration of interactive resources (Means et al., 2013). However, of these 45 studies, only seven of them pertained to K-12 students while the rest focused on college-aged students.

Plenty of research has also explored the academic advantages of blended learning. In a study exploring the effect of blended learning on students' conceptual understanding in

math, Setyaningrum (2018) found that 8th grade students who learned in a blended classroom had positive perceptions of the model and “significantly outperformed” those who learned in a traditional classroom (p. 250). Similar results were found by Smith and Suzuki (2014) when they compared Algebra II test performance after students received two types of instruction (live-lecture or screen-capture). Students who received blended learning performed significantly higher on the test than their peers who received traditional learning. Bhagat et al. (2016) also supported these results when comparing a flipped model (in which high school students watched video lessons outside of class time) to a conventional model. Their findings indicated improved learning achievement for students receiving instruction through the flipped model and high satisfaction and positivity towards the model.

It should be noted that Means et al. (2013) acknowledge that these elements alone could be confounding variables influencing the positive results found in these studies, suggesting that the type of learning environment is not the only factor in the positive outcomes reported. Poirier et al. (2019) explains that caution should be taken when analyzing these reports because “the lack of rigorous controls makes it difficult to attribute any observed advantage of blending per se as results could be equally attributed to differences in the uncontrolled variables” (p. 3). These uncontrolled variables might include related factors such as student perception, self-regulation, and teaching differences. Nortvig (2018) makes a similar claim, stating that the format of instruction alone does not necessarily lead to positive or negative outcomes. Instead, Nortvig (2018) claims it is “circumstantial and context-dependent. What one study counts as inhibiting for students’ learning, another finds conducive to it” (p. 48). The elements associated with blended learning could be the variables contributing to the positive outcomes within the literature. However, Means et al. (2013)

explain that support for blended instruction is still maintained because of the positive outcomes for students. Although the current study did not measure learning outcomes, identifying the potential benefits of blended learning environments is still valuable, especially if teachers are looking to implement this model of instruction.

Conclusion

Research has shown that satisfaction of competence, relatedness, and autonomy can lead to increased levels of student motivation (Aelterman et al., 2014; Ryan & Deci, 2017; Stroet et al., 2015). The learning environments in which these needs are satisfied are greatly influential and should be examined closely. Blended learning environments, in particular, have the potential to satisfy these needs through its student-centered, flexible, and collaborative structure (Sergis et al., 2018). However, research regarding the level of needs support in this type of environment is scarce. The current study will ask the following research question: Do students in a blended learning classroom differ from students in a traditional classroom on measures of perceived autonomy support, competency, and relatedness? In the following chapter, I outline the current study's method for addressing these research questions.

CHAPTER III

METHODOLOGY

The purpose of this action research study was to investigate students' perceptions of needs support in a blended learning classroom. Using Self-Determination Theory as the guiding framework, I surveyed ninth-grade students from a blended learning classroom regarding their perceptions of needs support and perceived effectiveness of their blended classroom. Including open-ended responses provided insight into the features of the blended learning classroom or teacher behaviors that may have influenced those perceptions.

Research Questions and Hypotheses

This study sought to answer the following research questions:

RQ1: Is there a relationship between perceived effectiveness of blended learning and students' perceptions of needs support?

Based on the opportunities afforded by the blended learning classroom, my hypotheses were:

H1: There will be a relationship between the blended learning classroom (as measured by ESBLI) and students' perceptions of needs support (as measured by the LCQ and PCS).

H2: There will be a relationship between blended learning classroom (as measured by the ESBLI) and students' perceptions of competency (as measured by the PCS).

Rationale: According to the affordances of a blended learning environment, (e.g. the added availability of the teacher and the flexibility of the environment), I expected students to perceive high needs support.

RQ2: How do the features of blended learning as identified by the students help explain perceived levels of needs support?

Due to the qualitative nature of this research question, no specific hypotheses can be formed. However, I expected students would mention the instructional videos or lack of lecture as the leading component of their needs being supported because this granted more opportunities for teachers to meet individual needs for both success and connection. Additionally, I thought this component would be mentioned because of how different the experience is compared to a more traditional setting. Based on prior research, I also expected students to mention self-pacing due to the autonomous nature of that component.

Context

The researcher's blended classroom is modeled after The Modern Classrooms Project, which incorporates three main components: blended instruction, self-paced structure, and mastery-based grading (Modern Classrooms, n.d.). Live lectures are eliminated and replaced with short 6 to 9-minute instructional videos that are accompanied by guided notes. Students typically watch the instructional videos during class time but are able to access them outside of class. After receiving their instruction, students move on to an activity to practice what they have learned and prepare themselves to show understanding on a "mastery check" when they are ready (which is a short, focused quiz that indicates a level of mastery on a specific topic/standard). Students are granted flexibility in regards to the timing of reaching these mastery checks because the class is self-paced. Soft and hard deadlines are in place to

help them reach their goals, but students are able to spend more or less time on certain lessons depending on their individual needs. This flexibility also gives the teachers more time to provide individual support and develop a healthy rapport with the students. Before progressing to the next lesson, students have to exhibit a certain level of competence, placing emphasis on mastery rather than speed. However, the consistency and thorough implementation of this model was somewhat restricted by the COVID-19 pandemic, as students experienced a portion of the school year virtually from home.

Procedure

Before performing the study, IRB approval was obtained. See Appendix A.

Recruitment and Participants

This study used convenience sampling. All students enrolled in one teacher's Algebra 1 class at one Northeastern Oklahoma suburban school were asked to participate in the study (approximately 144 students). According to the school's most recent demographic information from 2018, 60.5% of students identify as White, 6.1% Black, 2.7% Asian, 13.7% Hispanic, 7.8% Native American, and two or more races 9.3%. The age range was between 13-16 years old. Prior to the study, I had a brief discussion with each of my classes informing the students of the study and when it would take place (See Appendix B). Participants were selected based on parent consent and willingness to participate. Consent forms were sent to parents/guardians via email that included a thorough description of the study, an explanation of the purpose, and how their student would participate (See Appendix C). The parents/guardians were given a deadline to opt-out and respond if they wished for their student not to participate. To incentivize participation, students were informed of an

opportunity to provide their student ID number after taking the survey to enter a raffle for a \$10 Starbucks gift card.

Data Collection

A date and time was chosen by the researcher that was the least disruptive to the last few weeks of school. Students were given the surveys online, as all students owned a Chromebook and had access to the internet. Prior to the decided date, students were given an explanation of the study and an explanation that their responses would remain anonymous. At the decided date and time, I left my classroom and a colleague administered the survey by reading from a script (See Appendix D). This was done in an effort to reduce bias, mitigate what may have been perceived as coercion, maintain student anonymity, and help the teacher portray impartiality. Students were directed to the link of the Qualtrics survey which was posted in an accessible page within their learning management system. The first page of the survey provided an overview of the study with reminders of anonymity and asked for their assent to participate.

Students who opted out or chose not to give assent were directed to close out of the browser and work on something silently while the others continued with the survey. Students who gave assent continued to respond to the same three scales. The scales and items within them were all randomized, but all students received the same amount of scales/items. Items from the Learning Climate Questionnaire (LCQ) measured perceived autonomy and relatedness support and the Perceived Competence Scale (PCS) measured competence. Items from the Effectiveness of Self-Paced Blended Learning Inventory (ESBLI) measured students' perceptions of their experience with the blended learning classroom. Students also responded to three open-ended questions to provide further explanation and potential insight

into features of the blended learning classroom that contributed to their survey responses regarding the level of perceived needs support.

At the end of the survey, students provided demographic information and were then prompted to provide their student ID number if they wished to enter in the raffle drawing. To ensure anonymity, the online survey was programmed in a way that allowed a separate web page to open so students could provide their ID unattached to their survey responses. 95 ID numbers were pasted into an excel sheet and a random number generator (1-95) was used to select the ID in the chosen row. The student chosen by the raffle was notified and received the gift card by the researcher.

Survey Measures

Autonomy & Relatedness

Perceived autonomy support and relatedness were measured by the Learning Climate Questionnaire (LCQ). At the time of research, an appropriate scale specifically measuring relatedness could not be found. Because of the interdependency among autonomy and relatedness, the LCQ was chosen to measure both constructs. According to Stroet et al. (2015), the “three dimensions complement one another on their effects on students’ general level of need satisfaction” (p. 130). Reeve (2009) explains that when a teacher fosters students’ needs for autonomy, they also foster students’ needs for competence and relatedness. Specifically, Ryan and Deci (2020) state, “when teachers are autonomy supportive, they are more attuned to students’ perspectives, allowing more responsiveness to relational and competence concerns” (p. 4). Additionally, prior studies have found strong, positive correlations between autonomy and relatedness, indicating some level of

interdependence between the two constructs (Hornstra et al., 2021; Leenknecht et al., 2017; Wang et al., 2019).

The LCQ was adapted from the Health-Care Climate Questionnaire (Williams & Deci, 1996). It contains 15 items, measured with a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree) that provides the perceived level of autonomy support given by instructors in a particular learning setting/class. Although the items within this scale claim to measure autonomy support (e.g., *I feel that my instructor provides me with choices and options*), some items within this scale address relatedness (e.g., *I feel that my instructor cares about me as a person*). The scale is highly reliable; $\alpha = .96$ (Williams & Deci, 1996). A single mean score for this scale is computed, with higher average scores on this scale indicating a higher level of autonomy support for the LCQ.

Competence

Perceived competence was measured by the Perceived Competence for Learning Scale (PCS). It contains 4 items, measured with a 7-point Likert scale that provides the perceived level of feelings of competence or ability to master material within a particular course (e.g., *I feel confident in my ability to learn this material*). It was originally used in reference to learning material for an interview and has reliability above $\alpha = .80$ (Williams & Deci, 1996). Higher average scores indicate a higher level of competence.

Effectiveness of Blended Learning

Overall perception of effectiveness/satisfaction was measured by selected adapted items of the Effectiveness of Self-Paced Blended Learning Inventory (ESBLI; Balentyne & Varga, 2015). It contains 18 items, measured with a 5-point Likert-type scale (1 = Strongly Disagree, 5 = Strongly Agree) that provide information regarding student experience and

feelings toward a particular course. Items also asked about features of blended learning (e.g., *I enjoyed learning mathematics at my own pace*, *I did not like learning math on a computer*). With all items, the alpha score of reliability for this instrument was 0.94, but deletion of items 3, 9, and 17 increased the alpha score to 0.96 (Balentyne & Varga, 2015). The current study deleted those items in addition to item 18, which was a repetition of item 3 (e.g., *I enjoy getting to choose where I learn math*).

Open-ended Responses

To provide further insight into scale item responses, students responded to three open-ended questions related to each psychological need. Using a Likert-type scale, students rated the level to which they agreed with each of the following statements:

1. I feel successful in this class.
2. I feel connected to my teacher in this class.
3. I feel that I had some control over my learning experience in this class.

Each statement was followed by a question prompting them to explain (e.g., *What features of this blended classroom made you feel that way?*) with an open textbox for response. Due to an error during survey setup, the first statement had a 5-point Likert scale and statements 2 and 3 had a 7-point Likert scale.

Data Analysis

Once all data had been collected, a mean score for each scale was calculated and Pearson's r correlation was run to determine if there was a relationship between perceived effectiveness of blended learning (ESBLI) and student's perceptions of needs support (LCQ, PCS).

The open-ended responses were reviewed using content analysis and coded for common themes. I read through all of the responses multiple times and although I was expecting specific features of blended learning to be mentioned, themes related to understanding and instructor characteristics also emerged. Seven categories (with subcategories) were derived based on the recurrence of themes within responses. Frequencies of each theme were then counted to help identify patterns and provide further insight to the data.

CHAPTER IV

RESULTS

The purpose of this study was to examine the relationship between students' perceptions of needs support and the perceived effectiveness of blended learning. The data collected related to the degree that students perceived their needs of autonomy/relatedness, and competence were being met, and their perceptions about the effectiveness of blended learning.

Participant Demographics

An anonymous survey was distributed to five sections of an Algebra 1 class. Of the 141 students in the class, 113 (80%) students took the survey. One student did not take it due to lack of parental consent, whereas the rest of the students assumingly chose not to participate or were absent the day of the study. Although three integrity check items were used throughout the survey, the decision was made to keep all responses. No more than one integrity check item per response was incorrect, thus none were eliminated. The majority of participants reported an age of 15 (67%) and identified as male (52%) slightly more than female (45%). Participants also identified White/Caucasian (43%) as their race/ethnicity, with the next largest ethnic group being Hispanic/Latinx (18%). Additionally, a portion of the participants indicated a service of an IEP or 504 plan (20%). See Table 4.1 for a complete list of participant demographics. This sample of ninth graders is similar to the demographics of the school overall.

Table 4.1*Participants' Demographics*

	Frequency	%
Age		
14	29	25.7
15	75	66.4
16	9	8.0
Gender		
Male	59	52.2
Female	51	45.1
Nonbinary	2	1.8
Prefer not to say	1	.9
IEP or 504 Plan		
Yes	23	20.4
No	47	41.6
Prefer not to say	43	38.1
Race / Ethnicity		
White/Caucasian	48	42.5
Black/African-American	14	12.4
Hispanic/Latinx	20	17.7
Native American	9	8.0
Multi-ethnic	16	14.2
Prefer not to answer	6	5.3

Note: $N = 113$.

Data Analyses

Descriptive Statistics

The present study sought an answer to the question of whether or not there is a significant relationship between students' perceptions of needs support and perceived effectiveness of blended learning through a survey. The survey consisted of three subscales relating to students' perceptions of autonomy/relatedness (15 items), competence (4 items), and effectiveness of blended learning (14 items). For each subscale, participants' average score was computed using SPSS. The results of these analyses are summarized in Table 4.2.

It should be noted that the subscales for autonomy and competence were measured using a Likert scale of 1-7, whereas the subscale for blended learning used a Likert scale of 1-5.

Correlational Analyses

In order to answer my first research question regarding whether there was a relationship between perceived effectiveness of blended learning and students' perceptions of needs support, I used the mean score of each subscale to run Pearson's r correlations. Based on the opportunities afforded by a blended learning classroom, I hypothesized there would be a relationship between perceived effectiveness of blended learning (as measured by ESBLI) and students' perceptions of needs support (as measured by the LCQ and PCS). Analyses revealed a moderately strong, positive relationship between perceived competence and perceived effectiveness of blended learning ($r = .58, p < 0.01$) and a strong, positive relationship between perceived autonomy/relatedness and perceived effectiveness of blended learning ($r = 0.68, p < 0.01$). Thus, my initial hypothesis was retained. Among the sample of students, statistically significant, positive correlations were found between all three subscales. The results are shown in Table 4.2.

Table 4.2

Correlations between variables

Subscale	1	2	3
1. LCQ: autonomy/relatedness	-		
2. PCS: Perceived Competence Scale	.526**	-	
3. ESBLI: Effectiveness of Self-paced Blended Learning Inventory	.685**	.588**	-
Means	5.68	5.86	3.83
SD	1.21	1.22	.79
<i>Alpha</i>	.95	.93	.91

Note: $N = 113$. ** $p < 0.001$.

Blended Learning Features

To answer my second research question (How do the features of blended learning as identified by the students help explain perceived levels of needs support?), I included a Likert-type question based on each psychological need to prime students' perspectives, and then an open-ended question asking what features of the blended learning classroom made them feel this way. Again, it should be noted that a mistake was made in this portion of the survey. A 5-point Likert-type scale (1=Strongly Disagree; 5=Strongly Agree) was used for the competence question whereas a 7-point Likert-type scale was used for the relatedness and autonomy questions (1 = Strongly Disagree; 7 = Strongly Agree). Responses to these items are reported in Table 4.3 below.

Table 4.3.

Frequency of Responses (N = 113)

	Competence¹	Relatedness	Autonomy²
1	4 (3.5%)	4 (3.5%)	3 (2.7%)
2	3 (2.7%)	4 (3.5%)	5 (4.4%)
3	19 (16.8%)	5 (4.4%)	5 (4.4%)
4	35 (31%)	24 (21.2%)	13 (11.5%)
5	52 (46%)	16 (14.2%)	15 (13.3%)
6	NA	23 (20.4%)	24 (21.2%)
7	NA	37 (32.7%)	47 (41.6%)
Mean	4.13	5.31	5.61
SD	1.02	1.65	1.64

¹ (1-5) scale used

² One response missing

To help explain the scaled response, students were asked which blended learning features made them feel this way. Table 4.4 provides descriptions and examples of each code.

Table 4.4

Codes, descriptions, and examples

Category Code	Description	Example
Pacing		
P1	Description of pace identifying advantages	“Since I could work at my own pace I didn’t have to wait for anyone else to learn the material when I already knew it or I don’t have to rush as much if I don’t understand.”
P2	Description of pace identifying disadvantages	“The lessons go by super fast and they move on quickly...”
Understanding		
U1	Acknowledgement of greater understanding students had as a result of more time with the material	“I feel like I had time to really understand what was going on and if I needed help I just took a break and worked on more practices so before I took the test I really knew what was going on.”
U2	Description of teachers checking for understanding and answering questions	“Mrs. Collins always answers my questions and goes through the process with me so I understand better.”
Instructor Characteristics		
I1	Description of teacher showing care and understanding towards students	“My teacher has help[ed] me a lot and has understood me as a person and made sure that I was ok.”
I2	Description of taking time to talk to students or listen to them	“We can really talk about anything because they are very open and nonjudgmental of what you say.”
I3	Description of teacher being kind	“She is super sweet and nice and such a good teacher overall. She would help you if you had a question as best as she could.”

Category Code	Description	Example
Technology: videos/computer		
T1	Description of technology (i.e. videos or computers) identifying advantages	“I liked the videos for the blended learning class because it is good for visual learners and if you needed extra help, you could go back and watch the videos...”
T2	Description of technology identifying challenges or disadvantages	“It’s nice having them teach but I feel like blended learning is too quick and they should teach us at the front of the class, not on the computer.”
Choice C	Acknowledgement of choice within the classroom	“...there were different options to choose from for the practice assignments...”
Environment E	Description of the environment being welcoming or safe	“I felt safe around my teachers. They made me feel at home.”
Nonspecific N1	Responses that did not mention a feature of blended learning, restated the prompt, or were irrelevant.	“I do feel like I had some control over my own learning.” “I don’t think so because we have very different opinions on things.” “It would probably be the trinomials”

Competence Supporting Features

To elicit students’ ideas about which features in the blended learning classroom supported their competence, I asked them to indicate on a Likert-type scale (1-5) the degree to which they agreed with the following statement “I feel successful in this class.” The majority of students indicated agreement with this statement, as 87 students (77%) of the 113 selected a 4 or 5 on the scaled response ($M = 4.13$). Next, I analyzed their responses to the open-ended question “What features of the blended learning classroom made you feel this way?” Three themes were prominent within the responses: pacing, the teacher, and technology.

Students mentioned pacing (referring to advantages) 45 times, which represented 40% of the 113 responses. Students often reported feeling successful because they could work as quickly or as slowly as they wanted, taking their time to understand the material without the stress of feeling rushed. For example, students noted this with comments such as “Learning at my own pace makes me not panic and when I’m learning at my own pace, I feel like it really gives me enough time to really understand it.”.

In addition, 29 students (26% of the 113 responses) made positive comments regarding the teacher ensuring their understanding or answering their questions. One participant provided their reasoning stating, “The way the teachers taught really helped me understand the material we were learning because they would take the time to make sure everyone understood.” Another participant commented, “...If we got behind my instructor would help and try to get those who were behind on pace. And also help with any question you had about a problem.”

The third theme that emerged was technology, with 14 students (12% of 113 responses) commenting on the technology component of the class (such as videos, modules, or computer). For example, one student commented, “I liked the videos for the blended learning class because it is good for visual learners and if you needed extra help, you could go back and watch the videos...”

Relatedness Supporting Features

To elicit students’ ideas about which features in the blended learning classroom supported their relatedness, I asked them to indicate on a Likert-type scale (1-7) the degree to which they agreed with the following statement “I feel connected to my teacher in this class.”

A majority of students indicated agreement, as 76 students (67.3% of 113 responses) selected a 5-7 on the scaled response ($M = 5.31$).

Three themes also arose that helped explain the students' perception of relatedness. Similar to their responses regarding competence, 29 students also reported the teacher checking for understanding as an explanation for their scaled response, representing 26% of the 113 responses. Students commented on this with responses such as, "The teacher in this class is very helpful and helps you get to that goal you're working towards. She also makes everyone in the class understand the work greatly."

Two teacher characteristics were also prevalent among responses, with 26 students (23% of 113 responses) mentioning the ability to talk to and with their teacher, and 19 students (17% of 113 responses) mentioning the supportive nature of the teacher. For instance, two participants touched on both of those themes stating, "They are always there for us [whether] it be a math question or just talking about our day. They really seem to care about all of us..." and "[The instructor] lowkey is always trying to see my ways of learning and she listens to me when I need help and when I feel discouraged she uplifts me and motivates me to do my work. In my opinion she does a really good job of listening to her students."

Autonomy Supporting Features

To elicit students' ideas about which features in the blended learning classroom supported their autonomy, I asked them to indicate on a Likert-type scale (1-7) the degree to which they agreed with the following statement "I feel that I had some control over my learning experience in this class." Although one response was missing, a majority of students

indicated agreement, as 86 (77%) of them selected a 5-7 on the scaled response ($M = 5.61$). It should be noted that one response was missing from this question, resulting in 112 responses.

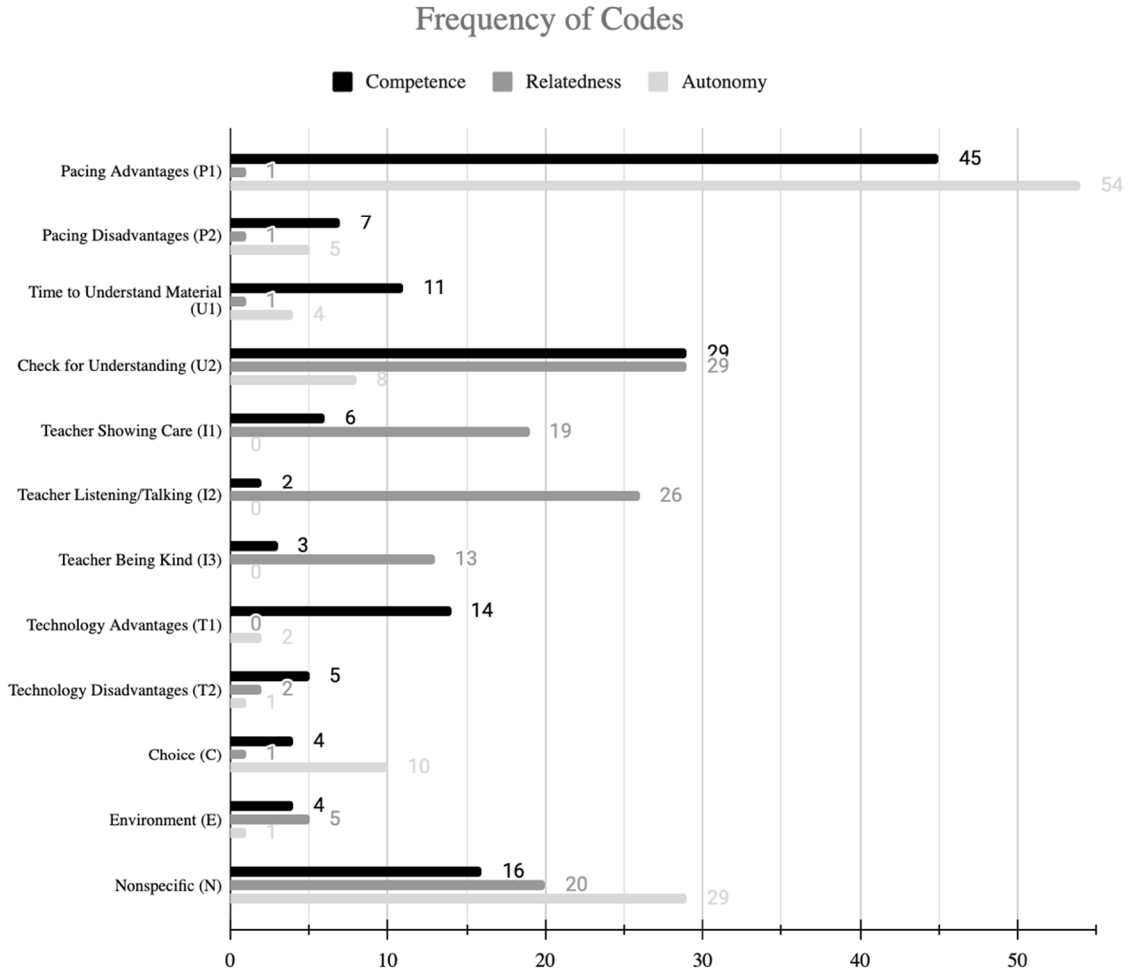
The major theme that was present within the responses regarding perceptions of competence was also present within the responses regarding autonomy. The theme of pace (referring to advantages) was mentioned 54 times, accounting for 48% of the 112 responses. Many students cited this as an explanation for feeling as though they had control of their learning experience, stating “I feel like I did because I could move on whenever I understood how to do the work and she always gave us a reasonable amount of time to complete our assignments” and “The reason I had control over my learning experience in this class is that I was going at my own pace and I didn’t have to feel like I was waiting on other students.”

Shared Themes

Some themes emerged in more than one area of needs support. For example, pace was mentioned as a reason for feeling supported in areas of competence and relatedness. Students also mentioned the teacher checking for understanding as reasoning for feeling supported in areas of competence and relatedness. See figure 4.4.

Figure 4.4

Frequency of codes among three needs



Disadvantages of Pacing and Technology

Students also reported perceived disadvantages of pacing and technology. Some responses described feelings of being rushed or struggling to stay on pace. The few students who indicated disadvantages of technology reported having a preference for traditional teaching or doing more work on paper.

Uncategorized Responses

It should be noted that a small portion of responses (19% of the overall total of 338) were coded as nonspecific. The responses coded this way did not fall into any of the common themes and often lacked specificity or relevance in relation to the prompt. For example, some students had neutral responses such as, “The blended learning was relatively easy,” or responses that only indicated agreement without any reasoning like, “Yes I agree that we had full control of what we learned in this class.” Students also had responses unrelated to the prompt such as, “I could see where I left off and easily remember.”

CHAPTER V

CONCLUSION

The purpose of this study was to investigate whether there was a relationship between perceived needs support and effectiveness of blended learning. Quantitative and qualitative data analyses revealed the presence and nature of these relationships, with implications for teachers who seek to create a blended learning environment. In this chapter, findings and implications are discussed, as well as limitations, suggestions for future research, and considerations for implementation.

Discussion

Needs Support is Related to Effective Blended Learning Environment

The results of the current study revealed significant positive correlations between perceived needs support and perceived effectiveness of blended learning in a 9th grade math class. These findings indicate that as students' perceived levels of competence and relatedness/autonomy support increase, their perception of the effectiveness of blended learning also increases. Students might be more apt to view their classroom structure/environment more positively when they feel that their needs are supported, seemingly attributing the blended learning structure to that fulfillment. Conversely, the more effective they find their environment, the more likely they are to feel that their needs are being met.

These correlations are noteworthy, as research is lacking in terms of examining a relationship between psychological needs and a blended learning model. Such findings are similar to those found in studies of flipped classrooms (e.g., Sergis et al., 2018). Sergis and colleagues (2018) investigated how a flipped classroom model influenced students' need satisfaction and reported higher needs fulfillment for students exposed to that model. Although there are differences among flipped and blended models, they share many of the same features that create an environment in which needs can more easily be supported (e.g. elimination of lectures). Both the current and aforementioned study provide some evidence that the degree to which students believe these models are effective is associated with their sense of needs fulfillment, thereby (according to SDT) increasing student well-being and motivation. These findings suggest that teachers looking for ways to improve their students' sense of competence, relatedness, and autonomy could consider implementing a blended learning model or explore the features that have proven to be effective. Responses to open-ended questions offer insight into some of these features.

Self-Pacing and Teacher Availability

Qualitative analysis of open-ended responses revealed several themes. Overwhelmingly, students mentioned self-pacing and identified several teacher characteristics as reasons for feeling that their needs were supported. In particular, students mentioned the self-paced structure as one of the features of blended learning contributing to their feelings of success and control of their learning experience (i.e., competence and autonomy). The recognition of this blended learning feature is noteworthy, as students were not primed with choices within the survey. A possible reason for this perceived support of competence and autonomy might be due to the speed at which they could choose to learn the

material and the structure of the class itself. Stroet et al. (2013) explain that students feel more autonomous when they engage in “learning as a self-chosen act” and “feelings of competence are enhanced as students feel they acquire more control over school outcomes” (p. 67). In a traditional setting, students learn at the rate decided by the teacher and typically must move on (or stay on pace with the class) regardless of their level of understanding. In this blended learning environment, students did not have to rush or slow down based on their classmates or teacher’s pacing, but rather based on their own cognitive needs. Many students cited feeling less stress and having more time to understand the material because of this. One student explained, “since I could work at my own pace I didn't have to wait for anyone else to learn the material when I already knew it or I don't have to rush as much if I don't understand.” By having the choice to move on or spend more time with the material, students are able to practice their self-regulation, fostering a sense of control over their success.

Surprisingly, self-pacing was one of the only blended learning features mentioned in students’ responses. Apart from a small portion praising instructional videos, students often responded with answers unrelated to a blended learning environment specifically and more associated with teacher behaviors or characteristics. For instance, in student responses concerning feelings of relatedness, they indicated the teacher was caring and understanding, talking with and listening to them, and was available to support student understanding (which was also mentioned as a contributing factor to competence).

Although the open-ended question specifically asked students to name blended learning features, one could argue that the answers they provided were a *reflection of the features* of the blended learning environment. For example, a possible inference is that the use of instructional videos in lieu of lectures (a blended learning feature) may have allowed

the teacher to be more responsive and available to student questions or personal needs, and it was these behaviors the students noticed rather than specific features of the blended classroom. Smith and Suzuki (2014) discuss similar results within their study, indicating a “new role of the classroom teacher” that students identified within their responses (p.141). A student from the current study cited feeling connected to the teacher because, “...the teacher is more like a supervisor in a way by going around the class and helping others including me. I feel like this way it is just way better for the individual student.” In the blended environment, teachers are not in the front of the classroom lecturing during class time. Instead, they are more available to check on their students, whether it be to answer individual questions or to chat about life.

In responses to questions regarding feelings of competence and relatedness support, several students mentioned the ability to easily ask questions and get help from the teacher. Components of structure (clarity, guidance, encouragement, and feedback) were implied within their responses. Most often, students touched on guidance and encouragement, with responses such as, “I feel successful in this class because [the instructor] is always there to help me through things I do not understand, when I'm down she always says positive things to lift my emotions and she is never negative about anything.” Students repeatedly mentioned the teacher being helpful and willing to take the time to ensure their understanding of the material, thus contributing to their feelings of success. Although clarity and feedback were not directly mentioned, both components are naturally incorporated into the process of strong guidance.

Responses referring to feeling connected to their teacher (i.e. relatedness) also referred to this availability to receive help, which reflects the relatedness components of

dependability and dedication of resources. By taking the time to answer questions and make sure that students feel confident in their understanding, students' sense of relatedness is strengthened. Students responding to the relatedness question also cited teacher characteristics such as being understanding or supportive, being a good listener, or simply being kind. These characteristics reflect the components of affection and attunement, as well as dedication of resources and dependability. Students had responses such as:

Because [the instructor] lowkey is always trying to see my ways of learning and she listens to me when I need help and when I feel discouraged she uplifts me and motivates me to do my work. In my opinion she does a really good job of listening to her students.

When students feel cared for by others, their sense of relatedness is strengthened.

Less Prominent Themes and Disadvantages

As noted previously, the technology component (i.e. videos) was the only other blended learning feature the students mentioned in their open-ended responses, mainly in regards to their feelings of success. In many cases, students mentioned this as a counterpart to self-pacing. For example, one student said, "Instead of having her in the front of the class and maybe not understanding I wouldn't have to stop the whole lesson for her to repeat something, I'm able to pause my video and replay it and get a better understanding. So I had control of what pace I was going and making sure I was successful in my lesson."

Some students cited technology as a disadvantage, reporting a preference for paper-based assignments or lecture-style teaching. Two students specifically mentioned feeling a lack of connection because of the less "personal" and more "independent" approach that the videos seemed to imply. One possible explanation for this is that those students potentially

wanted or needed more guidance as they learned the material, or that the teacher did not check in with them as often as they needed her support.

Students also reported disadvantages for self-pacing, suggesting that the speed of the lessons was too fast. Although the students had the freedom and flexibility to choose the amount of time they spent on lessons, due dates and deadlines were still in place to maintain structure and manage time. In some cases, students cited feeling rushed to complete lessons. While the teacher should take this into consideration when assigning those due dates and deadlines, it is worth considering whether some students lack the self-regulation skills necessary to help them stay on pace and what else the teacher might do to support these skills more effectively.

As with any instructional approach, the blended learning model has its weaknesses and is not a “one-size-fits all” environment. It is important to note these weaknesses so that those interested in implementing this model can find ways to address them.

Limitations and Suggestions for Future Research

Sample

This study was limited to one 9th-grade math class with one teacher. Of the 141 students invited to participate in the study, 113 responded to the survey. Although the sample size was adequate for this study, responses are likely to vary across different subject areas, age groups, instructors, and even location. In order to extend the scope and generalizability of this study, future researchers should consider gathering data from a variety of samples.

Additionally, because the students were all from the researcher’s class, some social desirability may have influenced responses. Although procedures were designed to eliminate as much of this influence as possible, students knew their teacher would be viewing their

responses (albeit anonymous) and could have answered more favorably because of it. Despite this being a limitation, it could have also contributed to the high response rate and willingness to complete the survey.

Notably, a portion of this sample also had an IEP or 504 plan. Of the respondents who chose to answer this demographic question, 20% reported having an IEP or 504 plan.

Although the question did not specify which content area or the plan the student was on, all students receiving co-taught services in Algebra 1 were in this blended math class. This population of students holds a considerable contribution to the responses that helped establish the most prominent themes of self-pacing and teacher availability. In another study researching the impact of a flipped model on students' cognitive outcomes and psychological needs, findings indicated the highest level of perceived needs support among the low-performing students (Sergis et al., 2018). This is noteworthy because these students typically require accommodations that could be met through this self-paced structure and increased teacher availability (e.g. extended time on assignments). Likewise, high-performing students may appreciate the ability to move ahead to extend their understanding or alleviate boredom. Given the feedback and data revealed in this study, this model should be investigated further to see if it is an effective and/or beneficial approach of instruction for students with learning disabilities or accommodations.

The current study also took place during the 2020-21 school year, which was impacted by the COVID-19 pandemic. Multiple times throughout the year, students transitioned to distance learning either individually or as a school, shifting to a completely virtual learning environment. During the times in which students were learning from home, participation was inconsistent, making it harder to support their needs and keep them

engaged. Although students experienced in-person learning the majority of the school year, the stress and inconsistency of the transitions could have impacted the students' motivation and experience overall, potentially altering their feelings about needs support or the blended model. On the other hand, this blended learning model could have also prepared them for these transitions and equipped them with self-regulation skills they wouldn't have otherwise had.

Model

Moreover, this study implemented The Modern Classrooms Project model of blended learning that included three specific components: instructional videos, self-paced structure, and mastery based-grading. The current study recognized a self-paced structure and instructional videos as features of the blended learning model, but did not have any measures regarding mastery-based grading. Although it is not typically a general feature mentioned along with blended learning, the grading approach may have influenced students' perceptions of competence support. With a mean score of 5.86 on a 7-point scale, perceived competence was fairly high. Although grading practices were not directly mentioned in student responses, the approach of mastery-based grading relies heavily on the components of competence, such as clarity and competency-based feedback. This approach provided students with the information they needed to become proficient and allowed students to progress only when they were prepared to do so, which compelled students to genuinely learn the material, perhaps contributing to their feelings of success.

If researchers want to learn more about the perceived effectiveness of this particular blended learning model, the study could be redesigned to ask about the specific features of the Modern Classrooms Project model. Features such as a self-paced structure, blended

instruction (using instructional videos), and mastery-based grading could be used as the measures in place of or in addition to the ESBLI measure. Ultimately, studying the Modern Classrooms Project model more closely could help researchers see potential value in the implementation of this specific blended learning approach and its associated features.

Instrument / Survey

Another potential issue is that the Learning Climate Questionnaire was used to measure both autonomy and relatedness, yet the scale was designed to measure only autonomy. However, the researcher chose to use this to measure both because of the items referring to relatedness within it (e.g. *“I feel that my instructor cares about me as a person”*) and the interdependency among the psychological needs. Nonetheless, to increase precision, a scale that measures relatedness specifically would be suggested for future research.

The phrasing of the questions prompting students’ perceptions of needs support also could have restricted participants’ responses. For example, the question prompting students to assess their perceived support of relatedness only addressed feeling connected to their teacher (e.g. *“I feel connected to my teacher in this class”*). According to the literature, relatedness also refers to the desire to feel a sense of belonging among others (Ryan & Deci, 2017). That sense could come from not just teachers, but also peers, so future researchers could consider rephrasing that question to include both aspects of relatedness. Furthermore, the question prompting students to assess their perceived support of autonomy could have limited responses. Again, it only addressed one aspect of autonomy support (e.g. *“I feel that I had some control over my learning experience in this class”*). Although feeling a sense of volition is included, the literature mentions how autonomy is also supported when teachers take students’ perspectives, provide interesting learning activities, or give students choice.

Careful consideration of a question that captures the majority of autonomy-supportive features should be examined.

Lastly, students responded to the survey question “What features of blended learning made you feel this way?” with more instructor behaviors than they did with blended learning features. The phrasing of the question might have primed them to answer in a way that led them to think about the source of those feelings (e.g. the teacher). To provide a greater awareness of the blended learning model and warrant more specific responses, the researcher or survey administrator could have provided students with a list of those features or informed them of the features prior to the survey date. Another option might require students to rank a list of blended learning features or respond on a Likert-type scale to determine which are most supportive toward their psychological needs. Similarly, the question could have been phrased to prompt the student to compare their blended learning experience to a traditional learning experience. They could have rated a statement such as, “I felt more successful in this blended math classroom than in traditional math classrooms,” then responded openly to the question “What features of this blended math classroom made you feel that way?” In this case, those questions might cause students to think about the differences between a blended and traditional classroom, helping them to recognize the features of a blended environment more easily.

Considerations for Implementation

Given that this study was performed on the researcher’s own classroom, the results and responses also represent student feedback that should be taken into consideration if instructors are looking to implement or improve this model. While the responses indicated an appreciation for self-pacing and teacher availability, students also reported some

disadvantages to this model that should be examined further. As previously noted, students indicated feeling rushed, a loss connection, and/or a preference for lecture-style teaching. To mitigate these feelings, teachers might try to identify why their students are feeling rushed. Is it a lack of self-regulation or time-management skills, or is the teacher not providing enough time for students to learn the material? In either case, the teacher should examine both possibilities and adjust to meet students' needs. To prevent a loss of connection, teachers can implement more one-on-one check-ins with students. Students feeling disconnected may be more independent or need less support from the teacher, which might reduce the amount of time the teacher spends with them. Teachers should be more intentional about checking in with their students, regardless of their need for academic support. On the other hand, this disconnect could be related to their preference for live lecture learning. To accommodate this and promote a greater sense of community, teachers might incorporate more opportunities for whole group instruction or activities. Finally, teachers considering implementation of a blended learning model (or any model of instruction) should continually ask for and reflect upon their students' perspectives, as they offer one of the most valuable sources of feedback.

Conclusion

Not only does this study offer valuable insight into how teachers can support students' psychological needs, but it also provides an idea for the type of environment in which those needs can be nurtured. While the results of the current study cannot claim that the blended learning environment is solely responsible for these positive perceptions of needs support, the themes revealed in student responses suggest that the environment affords opportunities for that needs support that might not otherwise be as practical in a more traditional classroom. Without the replacement of the time-consuming lecture with

instructional videos, these responses may not have been as prevalent. This factor allowed for self-pacing and increased teacher availability to be possible. Given self-determination researchers have argued that needs support is strongly influenced by contexts or environments, these findings are noteworthy as they offer direct insight into which environmental features students believe supported their needs. As learning environments have changed over the last few years and the implementation of virtual and blended models have become more prevalent, it is important to note ways in which we can psychologically support our students in the classroom--especially at the secondary level when motivation can be more challenging to maintain. While more research is warranted, this study suggests that a blended learning model might offer a viable solution to this problem. The implementation of this environment grants teachers the opportunity to be more available to meet the individual needs of their students, foster motivation, and increase academic success

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APPENDICES

APPENDIX A



Oklahoma State University Institutional Review Board

Date: 03/29/2021
Application Number: IRB-21-152
Proposal Title: Investigating Students' Perceptions of Needs Support in a Blended Learning Classroom

Principal Investigator: Tameko Collins
Co-Investigator(s):
Faculty Adviser: Jane S Vogler, Ph.D.
Project Coordinator:
Research Assistant(s):

Processed as: Exempt
Exempt Category:

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,
Oklahoma State University IRB

APPENDIX B

Prior to the study, the researcher will read this script to inform her students of the study:

A lot of you know that I am in graduate school right now earning my Master's degree. To graduate, I've chosen to write a thesis. This means that I choose a topic I'm interested in, research it, and perform a study to learn more about it. For my thesis, I've chosen to learn more about the blended learning classroom (which is the structure we're using in our class). I want to learn more about your experiences as students, specifically, so that I can learn how to teach more effectively for my future students. With parent approval and your assent (agreement), you will participate in a survey to help me learn about that. You do not have to participate, it is completely voluntary. Additionally, your responses will be anonymous and I will not be present during the survey so we will have no way of knowing who does or does not participate. If you do decide to participate (and have parent approval), you will have the opportunity to enter your ID number into a separate link to be entered into a drawing for a \$10 Starbucks gift card. On [decided date], [survey administrator] will send out an email asking your parents for their consent (or approval) for you to participate in the study. They will need to respond by [deadline] if they wish for you not to participate. On [decided date of study], you will take the survey if you agree to participate.

APPENDIX C

Sender: [survey administrator email]
Subject line: Student Research Participation

Hello,

My name is (survey administrator) and I am a teacher here at (school name). I am seeking permission on behalf of your student's math teacher, Tameko Collins, to have your student participate in a study she is performing in affiliation with Oklahoma State University to determine if there is a relationship between a blended learning classroom and students' perceptions of support of autonomy, competence, and relatedness.

The study will involve an anonymous questionnaire that your student will complete online during one day of class in early May. Your student's participation is *voluntary* but as an incentive, he/she will be entered into a drawing for a \$10 Starbucks gift card if they choose to participate.

[Name of instructor] will work to ensure confidentiality to the degree permitted by technology. It is possible, although unlikely, that unauthorized individuals could gain access to student responses because they are responding online. However, their participation in this online survey involves risks similar to a person's everyday use of the internet. If you have concerns, you should consult the survey provider privacy policy at <https://www.qualtrics.com/privacy-statement/>

If you have any further questions about your student's rights as a participant, please contact OSU's Institutional Review Board:

Website: <https://irb.okstate.edu/>

Ph: 405-744-3377 | Fax: 405-744-4335 | irb@okstate.edu

If you wish for your student NOT to participate in this study, please reply to this email by Friday, April 30. Additionally, if you have any questions, please feel free to reply to this email or call me at the number provided below.

Thank you!

[Name of survey administrator]

[Title]

[School Name]

(###) ### - #####

APPENDIX D

Script for survey administrator:

“Today you’ll take an anonymous survey that will ask you questions about your learning experience in this math class. This study is being conducted in an effort to learn about your experience in this blended learning math classroom and to learn how to teach students more effectively. The first page of the survey will give you information about the study and ask you if you agree to participate. If you agree, you’ll click “next.” You will not be asked to provide your name or any other identifying information, so your teacher will have no way of knowing what your responses were or if you even participated. However, please answer the questions honestly and thoughtfully. At the end of the survey, you will be asked if you want to enter in a drawing for a \$10 Starbucks gift card as a reward for your participation. If you choose ‘yes,’ you’ll be taken to a new link (separate from your survey responses) where you will provide your student ID number. A random number generator will be used and a winner will be selected and notified before school is out. Please go to the link provided and begin the survey. Raise your hand if you have any questions.”

Survey administrator will direct students to a link posted in Canvas

VITA

Tameko Marie Collins

Candidate for the Degree of

Master of Science

Thesis: INVESTIGATING THE RELATIONSHIP BETWEEN STUDENT PERCEPTIONS
OF NEEDS SUPPORT AND A BLENDED LEARNING CLASSROOM

Major Field: Educational Psychology

Biographical:

Education:

Completed the requirements for the Master of Science in Educational Psychology at Oklahoma State University, Stillwater, Oklahoma in December, 2021.

Completed the requirements for the Bachelor of Arts in Elementary Education at The University of Tulsa, Tulsa, Oklahoma in 2016.

Experience:

Ninth Grade Algebra Teacher, Broken Arrow Public Schools 2017-current

Fifth Grade Math/Science Teacher, Tulsa Public Schools 2016-17