An Analysis of Effective Online Tutoring in Higher Education

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Does Effective Tutoring Support Academic Success? An Analysis of Brainfuse Online Tutoring Use and Student Retention in two Higher Education Institutions

Abstract

Tutoring is a key resource for students in higher education, supporting immediate needs, bolstering confidence, and building critical learning skills applicable across courses and beyond the degree. Quality online tutoring provides students with proactive and point-of-need expertise in a tool-rich environment. The purpose of this study is to examine the impact that Brainfuse Online Tutoring services may have had on the retention or academic success of students who used its services at University of Wisconsin-Stout (UW-Stout) and Kentucky Community and Technical College System (KCTCS). Results indicated that the retention rates for students who utilized Brainfuse Online Tutoring were higher than the rates of college students as a whole. Additionally, retention rates increased in a linear fashion relative to hours of tutoring utilized. As online tutoring hours increased, so did retention rates. Results also indicate that students in the early stages of their degree progress utilized Brainfuse Online Tutoring at a much higher rate compared to students in later stages of their degree progress.

I.   Introduction

In recent years, higher education institutions have faced growing demands for rapid

innovation in order to slow student attrition, while also leveraging technology to increase

efficiencies and serve our evolving knowledge of why and how students learn. The distinct

paths of these initiatives occasionally and fortuitously cross when technology can be

leveraged to make learning more efficient and also more effective as a retention asset; the

development of personalized, multimedia-rich hybrid and online classrooms are well-

documented examples of innovations to the students' 'classroom' learning experience.

Tutoring, specifically face-to-face or online peer tutoring, is often both pointed to by

higher education practitioners and sought out by students as a critical resource outside of

the classroom as a key contributor to student performance (Hanover Research, 2014a;

Koening, 2019; Navarra-Madsen & Ingram, 2010; Vance, 2016). However, far less attention

is given in literature to the innovations of online tutoring and the impact of effective

tutoring – especially effective online tutoring – on student academic success. The purpose

of this paper is to examine the impact that Brainfuse Online Tutoring services may have

had on the retention or academic success of students who used its services at University of

Wisconsin-Stout (UW-Stout) and Kentucky Community and Technical College System

(KCTCS).

II.   Literature Review

Tutoring is frequently recognized in the literature as a key resource in higher

education. A sampling of the literature identifies a variety of ways that tutoring supports

academic success, including but not limited to developing writing and subject-matter

expertise, improving literacy and subject skills, and boosting student confidence (Arco-

Tirado, Fernández-Martín, & Fernández-Balboa, 2011; Hanover Research, 2014b; Nelson

Royes, 2018; Pugatch & Wilson, 2018; Santee and Garavalia, 2006). The report *Increasing*

College Opportunity for Low-Income College Students identified tutoring as a critical

resource for students entering college and completing remedial courses upon college

admission (2014, The Executive Office of the President).

Tutoring for students in higher education occurs in a variety of modalities. While

most of the literature focuses on face-to-face professional (faculty/graduate student) and

peer tutoring, fewer studies were found on online peer tutoring (De Smet, Van Keer, &

Valcke, 2009; Fox & MacKeogh, 2003; Sansone, Ligorio, & Buglass, 2018), despite the fact

that online tutors are often a critical bridge between online students and higher education

institutions (de Metz & Bezuidenhout, 2018). The study of professional tutoring services

(online or otherwise) for college students is largely absent from the literature. Despite this

gap, however, long-existing best practices serve to inform professional/student

interactions in online tutoring environments.

Benjamin Bloom (1984) identified that group instruction had the potential of being

as successful as one-to-one tutoring if institutions "find ways of improving students'

learning processes, the curriculum and instructional materials, and the home

environmental support of the students' school learning" (p. 17). In modern tutoring

environments, the scope of the curriculum and instructional materials are within the

purview of the institution. However, learning processes and environmental support are still

key elements of tutoring. Ripamonti, Galuppo, Bruno, Ivaldi, & Scaratti (2018) echo Bloom's

research by describing the role of tutorship as one that supports critical reflexive practices that drive the learner to higher order thinking. Tutors help students build critical reflexive practices by using different techniques to introduce increasingly challenging material that require students to adapt and build new learning behaviors. Techniques may include varying the tutoring style, using a variety of open-ended interview questions, and providing detailed feedback are all examples of methodologies that help students feel comfortable while engaging them beyond knowledge retention (Sturman, 2018). These techniques – and accompanying tools – are especially effective for supporting learners who seek tutoring since their use are highly adaptable depending on the skill of the tutor and the learning needs of the student.

Additionally, the development of a positive relationship between tutor and tutee is also a key best practice. Studies indicate that positive tutor-student relationships enhance student well-being and confidence (Kara & Can, 2019; Matthewman, Jodhan-Gail, Nowlan, OSullivan, & Patel, 2018). Students want to engage with tutors who understand the difficulty of their transition into academic writing, validate their existing and growing skills, and build relationships through detailed and repeated interactions (Denny, Nordorf, & Salem, 2018).

The literature paints a clear picture: student use of tutoring in combination with the use of effective tutoring techniques leads to student academic success in peer-tutoring modalities. The purpose of this study is to identify how Brainfuse Online Tutoring may impact student success through an analysis of student use data and features of the platform that may contribute to tutoring effectiveness.

III.   Study Participants

Brainfuse Online Tutoring initiated the study and provided the tutoring data corresponding to the information provided by the higher education clients who participated in the study: The University of Wisconsin – Stout, and Kentucky Community and Technical College System.

1. Brainfuse Online Tutoring

Brainfuse Online Tutoring provides one-to-one tutoring sessions, writing feedback, test preparation, study aids, and career services for college students at all types of higher education institutions. Brainfuse offers live online tutoring in subjects where students frequently show higher need for support outside of the classroom including: Math, Writing, Reading, Computers and Technology, English for Speakers of Other Languages, Health Professions, Business, History, Science, and Spanish. Students and tutors communicate through a multimedia-rich online interface that includes file sharing, screen sharing, graphing, and other drawing tools in addition to chat and optional audio/video functionality. Tutors are based in the United States and hold a minimum of a master's degree in the subject in which they tutor.

2. University of Wisconsin - Stout

University of Wisconsin – Stout (UW-Stout) is a public university in Menomonie, WI, enrolling over 9,500 students. Designated as "Wisconsin's Polytechnic University" in 2007, UW-Stout offers undergraduate and graduate programs in six fields of study: art, design, and graphics; business and management; education; human and social sciences;

information technology and communications; and science, engineering, and math (Board of Regents, University of Wisconsin, 2019).

3. Kentucky Community and Technical College System

Kentucky Community and Technical College System (KCTCS), comprised of 16 institutions, enrolls over 100,000 students, more than 40% of all undergraduate students in Kentucky (2020, Office of Research & Policy Analysis). KCTCS offers associate degrees, diplomas, and/or certificates in 111 programs designed for workforce preparedness or four-year degree completion.

The tutoring use and retention data of 512 students from UW-Stout and 373 students from KCTCS were included in this study, in addition to the aggregate retention rate of each respective institution. Information was not made available for both institutions regarding students' ethnicity, gender, or program distribution.

IV. **Methodology**

In early 2019, an email invitation (Emily OConnor, personal communication, March 10, 2019) was sent to participating institutions to provide data for an effectiveness study. As a result of mutual consultation, the participating institutions agreed to provide the following data:

- Raw student retention data from students who were enrolled as freshman in 2017.
- Retention rates as a whole for their institution (for control/baseline).

- Optional: Individual student enrollment data for Brainfuse users – otherwise, Brainfuse would match the institutions' data to Brainfuse's own records to identify those users and calculate retention for these students separately.

Once Brainfuse received raw student retention data from participating institutions, the retention data was matched to student tutoring use data from Brainfuse. The data sent was then analyzed and the retention data of students who used Brainfuse online tutoring was compared to the retention rates of all students enrolled in the same timeframe (KCTCS) or the retention rates of all students enrolled the year prior (UW-Stout).

V. Ethical Considerations

Participating institutions, the author, and Brainfuse worked to ensure student data was ethically handled, used, and protected. Participants were given the option to abstain or withdraw from the study at any time. Individual student information maintained by Brainfuse is protected and managed according to the Family Educational Rights and Privacy Act (FERPA). Participating institutions were asked to send corresponding retention records for students who both used and did not use tutoring. Institutions were given options for secure data transfer. Data was sent to and managed only by Brainfuse employees who already had access to student tutoring data. Once student tutoring use data from Brainfuse was matched to retention data from the institution, raw data findings were returned to the institutions and all data sent to Brainfuse from participating institutions was destroyed.
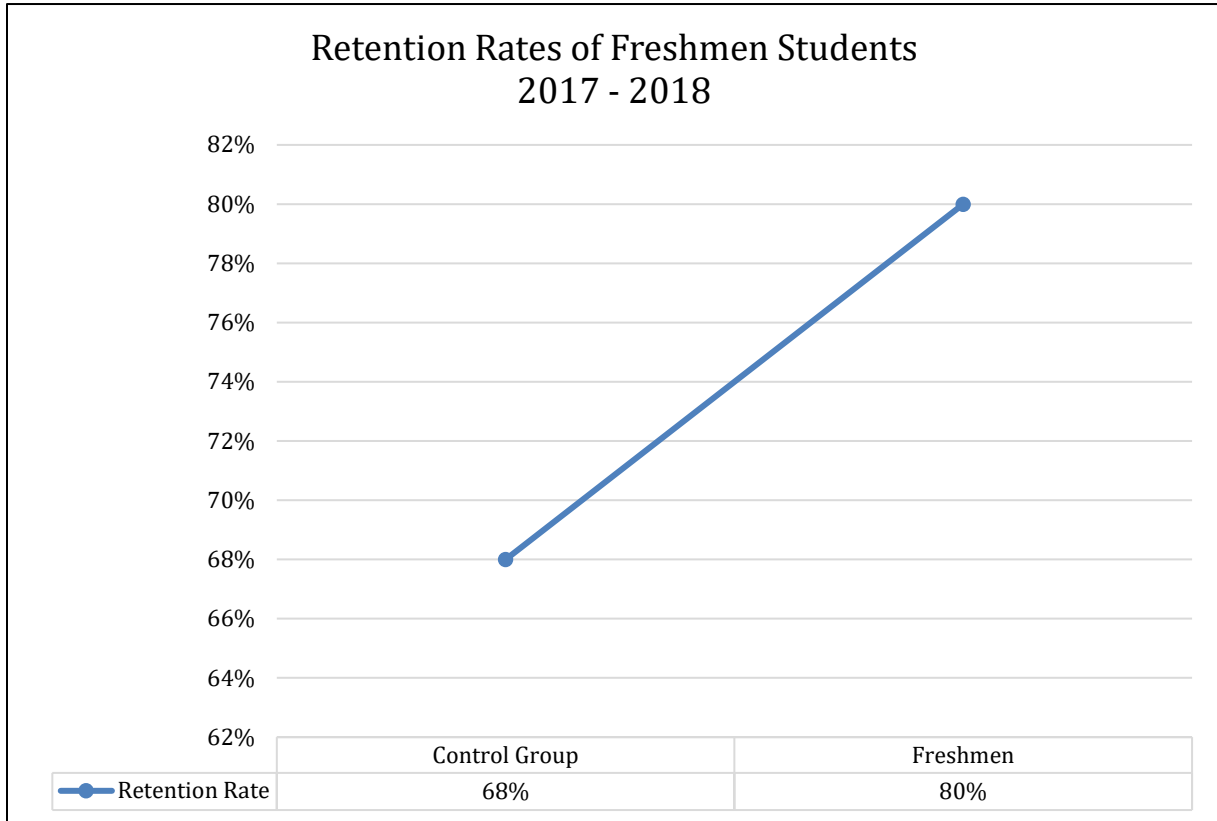
VI. Key Findings

1. **The retention rates for students who utilized Brainfuse online tutoring were higher than the rates of college students as a whole.**

      Retention rates for UW-Stout students who utilized Brainfuse online tutoring were 12% higher than the retention rates of UW-Stout freshman students as a whole, which served as the control group (see Figure 1 – UW-Stout). Retention rates for KCTCS college students who utilized Brainfuse online tutoring were 11% higher than the retention rates of KCTCS college students as a whole (see Figure 2 – KCTCS). These results align with those of multiple studies indicating positive correlation between tutoring and retention. Furthermore, these findings match those from Sunday and Rascon (2016), Satyanarayana, Li, and Braneky (2014) and Civitas Learning (2019) indicating that college student who use tutoring retain at a rate of 9% or more than the retention rate of college students who do not use tutoring.
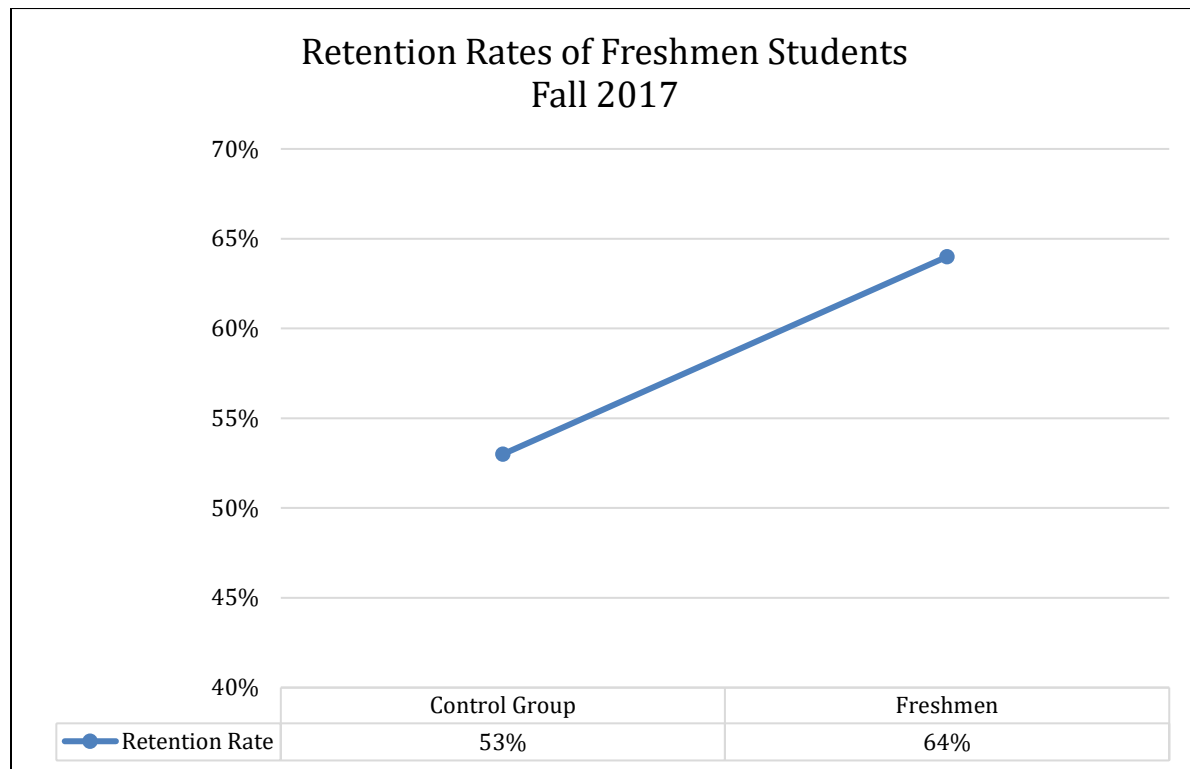
Figure 1 – UW-Stout

Retention Rates of Freshmen Students
2017 - 2018

	Control Group	Freshmen
Retention Rate	68%	80%

*The Freshmen retention rates above were calculated by looking at the number of students who utilized Brainfuse in the fall of 2017 and were retained by the College in the subsequent fall term. The Control Group retention rates are based on the retention rates published by the College for freshmen students who enrolled in the College fall 2016. Retention rates for College students who utilized Brainfuse services were 12% higher than the retention rates of College students as a whole.

[Retention rates were not compared to freshmen students who utilized Brainfuse in fall of 2016 as the number of students were statistically insignificant.]

Figure 2 – KCTCS

	Control Group	Freshmen
●— Retention Rate	53%	64%

Retention Rates of Freshmen Students Fall 2017

*The Freshmen retention rates above were calculated by looking at the number of students who utilized Brainfuse in the fall of 2017 and were retained by the College in the subsequent fall term. The Control Group retention rates are based on the retention rates published by the College for freshmen students who enrolled in the College fall 2017. Retention rates for College students who utilized Brainfuse services were 11% higher than the retention rates of College students as a whole.

**College did not provide raw number of students enrolled as Freshmen during the fall 2017 semester

2. **Retention rates increased in a linear fashion relative to hours of tutoring utilized.**
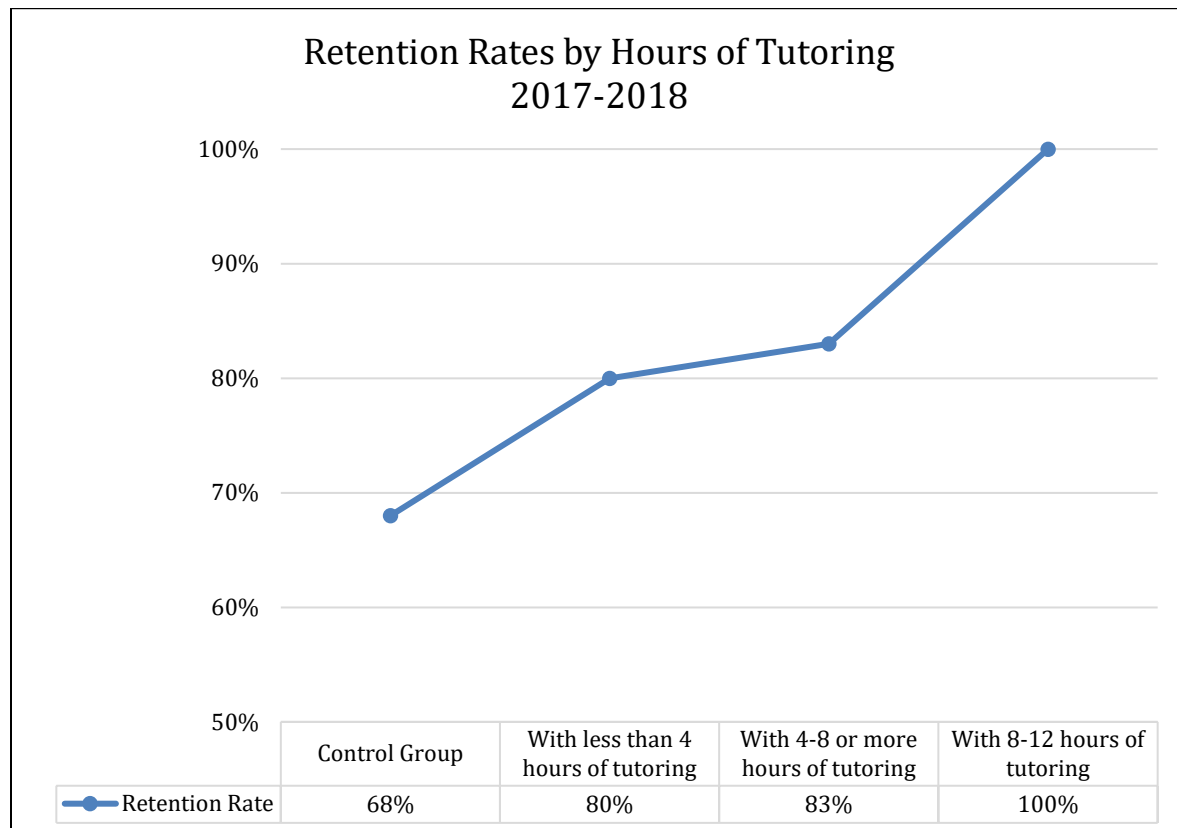
   As online tutoring hours increased, so did retention rates.

   The data from both UW-Stout (Figure 3 – UW-Stout) and KCTCS (Figure 4 – KCTCS) indicate that students who used more tutoring hours had a greater likelihood of academic success than students who used fewer hours of tutoring or no hours of tutoring (control).
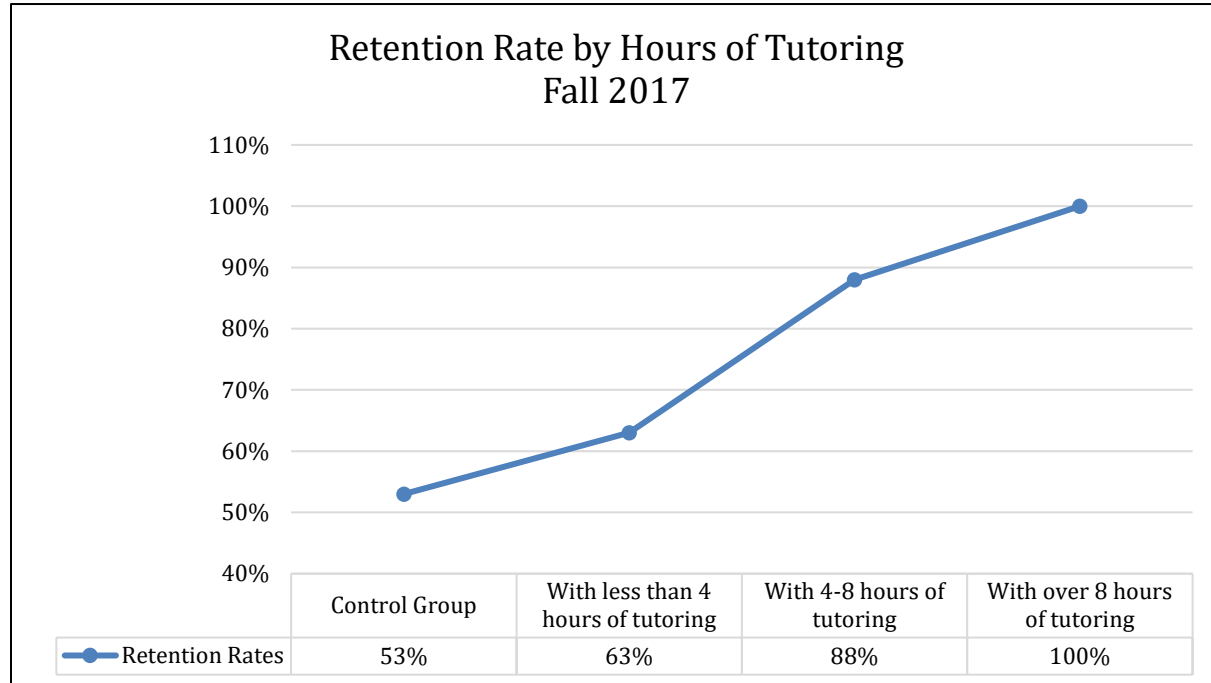
As previously discussed, students' use of tutoring and other support services correlates to their academic success. However, unlike the findings of Coladarci, Willett, and Allen (ND) and Vance (2002), this analysis suggests that students who use a greater number of tutoring hours have a higher likelihood of academic success than students who use fewer or no hours of tutoring.

Figure 3 – UW-Stout

Retention Rates by Hours of Tutoring 2017-2018

	Control Group	With less than 4 hours of tutoring	With 4-8 or more hours of tutoring	With 8-12 hours of tutoring
Retention Rate	68%	80%	83%	100%

* Retention rates above were calculated by looking at the number of students who utilized Brainfuse in the fall of 2017 and were retained by the College in the subsequent fall term. The Control Group retention rates are based on the retention rates published by the College for freshmen students who enrolled in the College fall 2016.

Figure 4 – KCTCS

Retention Rate by Hours of Tutoring
Fall 2017

	Control Group	With less than 4 hours of tutoring	With 4-8 hours of tutoring	With over 8 hours of tutoring
Retention Rates	53%	63%	88%	100%

* Retention rates above were calculated by looking at the number of students who utilized Brainfuse in the fall of 2017 and were retained by the College in the subsequent fall term. The Control Group retention rates are based on the retention rates published by the College for freshmen students who enrolled in the College fall 2017.

3. **Students in the early stages of their degree progress utilized Brainfuse online tutoring at a much higher rate compared to students in later stages of their degree progress.**

   At UW-Stout, undergraduate students, on average, used online tutoring at a higher rate than graduate and doctoral students (Figures 5 and 6 – UW-Stout). Similarly, freshmen students at KCTCS utilized Brainfuse online tutoring at a higher rate compared to non-freshmen students (Figure 7 – KCTCS). When coupled with other key findings in this study and outside scholarship, this data suggests that higher education institutions should encourage students to use Brainfuse online tutoring early and often in their programs to
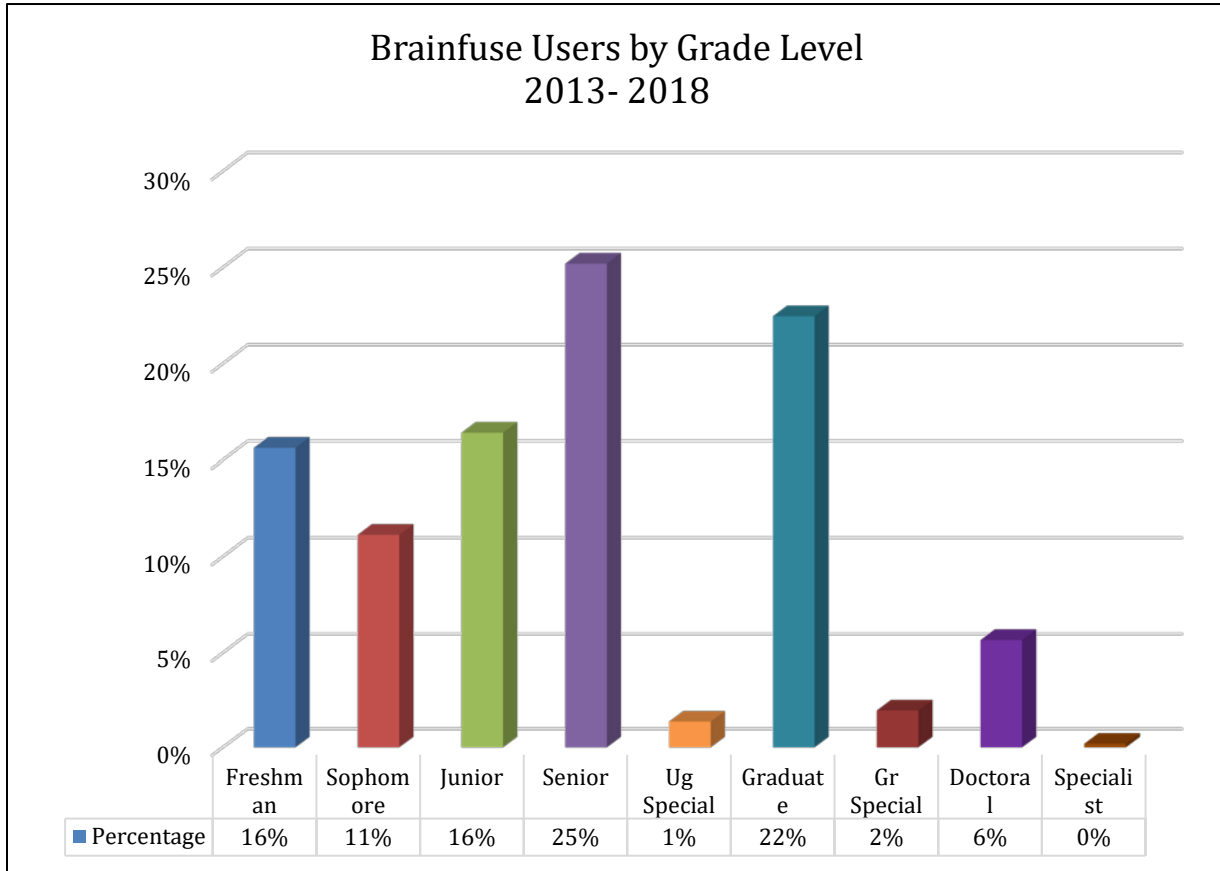
increase their likelihood of academic success and graduation. This data also points to

opportunities for future research on the impact of tutoring on graduate student retention

as well as the impact of tutoring on students who use tutoring services over most or all of

their undergraduate and or undergraduate and graduate coursework.
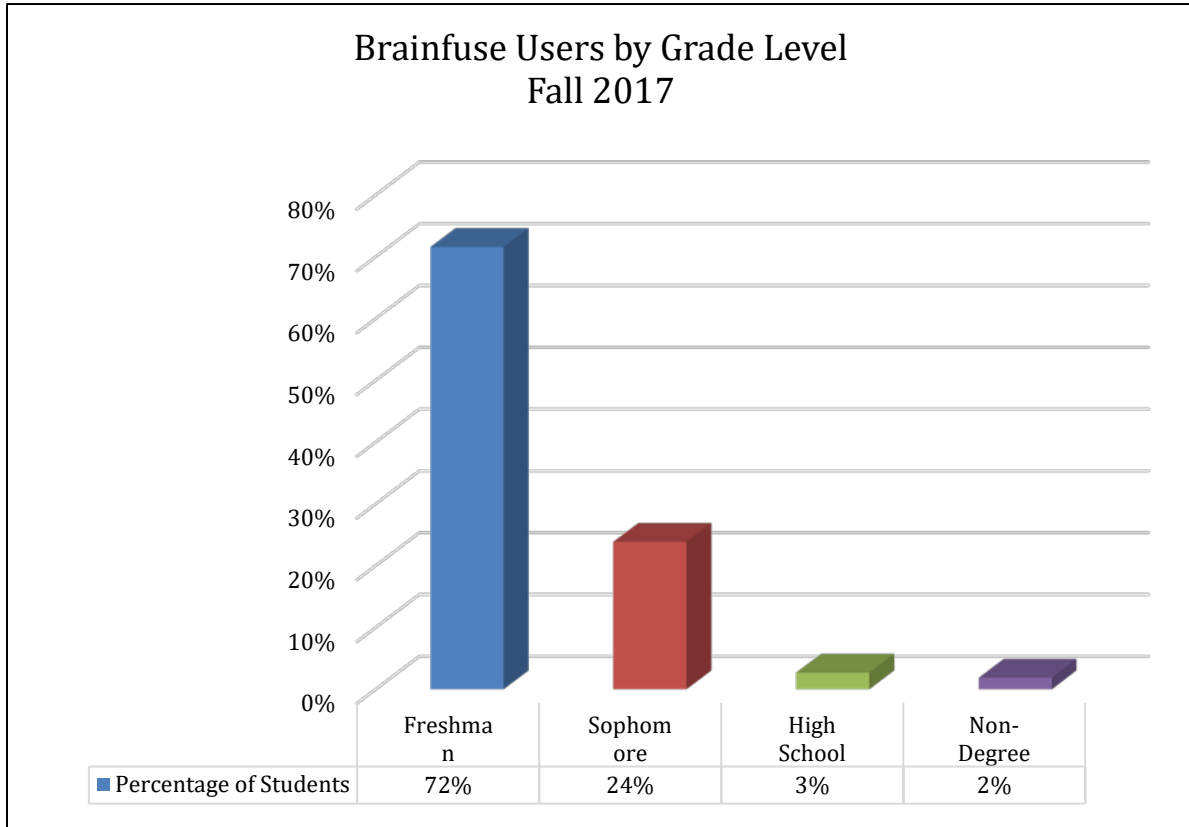
Figure 5 – UW-Stout
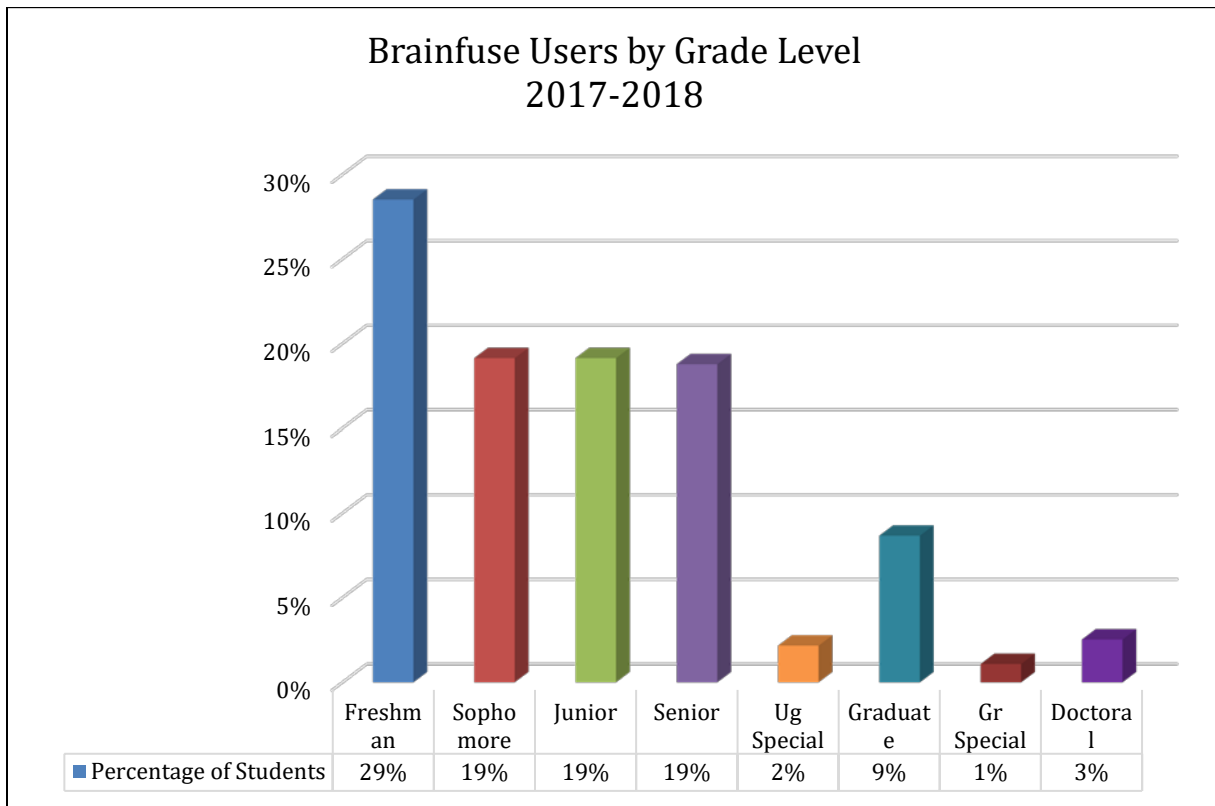
*The chart above displays the Grade Level breakdown of College users who utilized Brainfuse
services in the 2017-2018 academic year.

Figure 6 – UW-Stout

	Brainfuse Users by Grade Level 2013- 2018								
	Freshman	Sophomore	Junior	Senior	Ug Special	Graduate	Gr Special	Doctoral	Specialist
■ Percentage	16%	11%	16%	25%	1%	22%	2%	6%	0%

*The chart above displays the Grade Level breakdown of College users who utilized Brainfuse services in the 2013, 2014, 2015, 2016, 2017 and 2018 academic years.

Figure 7 – KCTCS

Brainfuse Users by Grade Level
Fall 2017

|	Freshman	Sophomore	High School	Non-Degree
■ Percentage of Students	72%	24%	3%	2%

*The chart above displays the Grade Level breakdown of College users who utilized Brainfuse services in the fall 2017 semester.

VII.   Additional Findings

In addition to the data provided by both the UW-Stout and KCTCS analyzed above, KCTCS (Figure 8 – KCTCS) also provided Brainfuse with a breakdown of Brainfuse Online Tutoring users by Pell Grant eligibility status. While use of tutoring by Pell grant-eligible students is not correlated with academic success in this study, free access to tutoring services at their higher education institution may provide students with needed academic support that they may not otherwise be able to afford.

Figure 8 – KCTCS

Brainfuse Users with Pell Eligibility
Fall 2017

	Yes	No/NA
Brainfuse Users	72%	28%
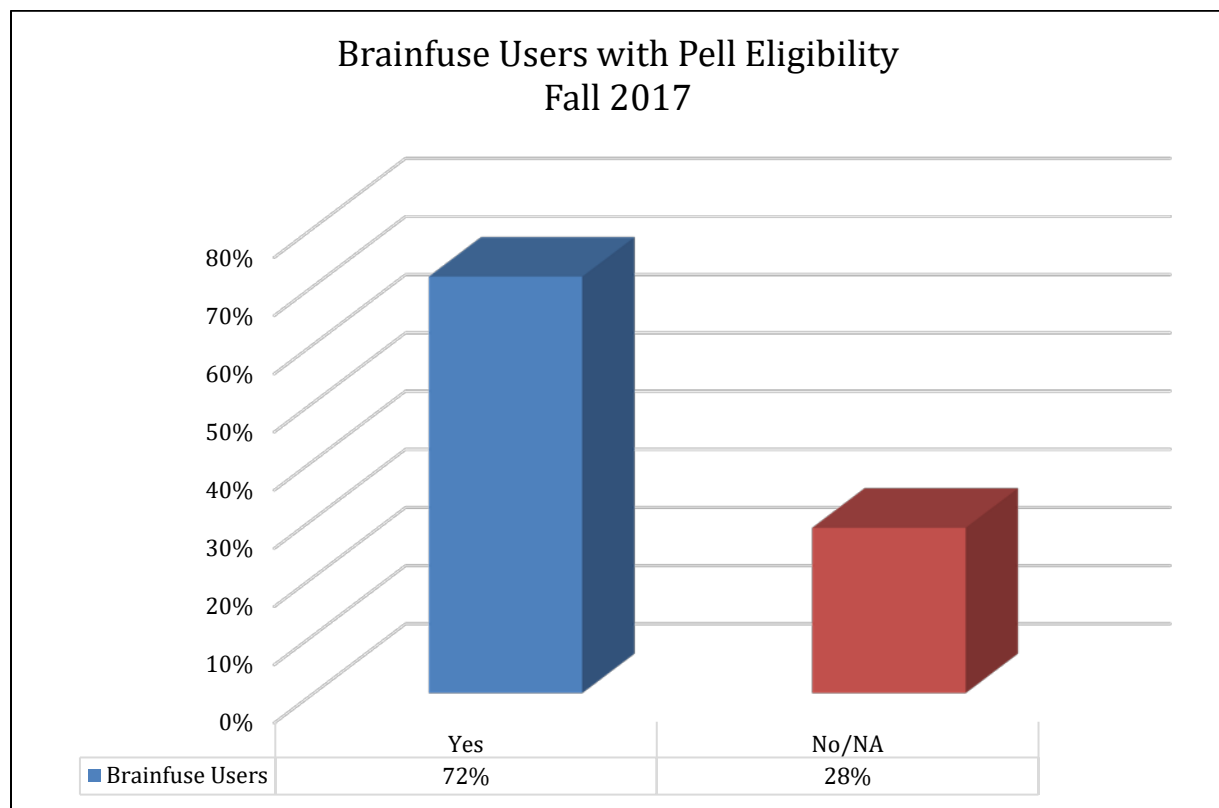
*The chart above displays the eligibility status of College users who utilized Brainfuse services in the fall 2017 semester.

Although this study primarily focuses on the impact of the use of online tutoring on student academic success, the impact of student satisfaction with online tutoring must also be considered. Several studies, including those of Fantuzzo, Dimeff, & Fox (1989); Hendriksen, Yang, Love, & Hall (2014); and Kim & Hahn (2017) indicate that satisfaction with tutoring services or with an overall program that included tutoring services corresponded with overall student success in a course or program.

Brainfuse collects satisfaction survey data from students at the end of each tutoring session (completion of the survey is optional). Brainfuse collated its satisfaction survey data from participating institutions from 2017 – 2020, which overlaps the timeframe of tutoring usage and retention data collected and analyzed for this study for participating institutions. Over 90% of the students who participated responded positively that Brainfuse Online Tutoring helped them improve their grades and that they were satisfied with their session(s).

Table 1: Brainfuse Online Tutoring Satisfaction Survey Results, UW

Question	Survey Results
Were you satisfied with this session?	97%
Is this service helping you improve your grades?	92%
Is this service helping you be more confident about your school work ?	88%
Are you glad you school offers this service?	96%

Table 2: Brainfuse Online Tutoring Satisfaction Survey Results, KCTCS

Question	Survey Results
Were you satisfied with this session?	95%
Is this service helping you improve your grades?	94%

Is this service helping you be more confident about your school work ?	**90%**
Are you glad you school offers this service?	**96%**

These results indicate a high level of satisfaction with Brainfuse Online Tutoring services. Brainfuse recently redesigned its satisfaction survey to gauge satisfaction in a one-to-one tutoring session (since students may also be using other services, such as the Writing Lab, Study Center, or online collaboration tools available through the Brainfuse platform). Additionally, new survey questions also ask students to self-assess confidence, a key indicator in self-efficacy correlated to academic performance **(**Putwain, Sander, & Larkin, 2013**)**. Future research opportunities include the analysis of this new satisfaction survey data and how it may relate to the use of Brainfuse Online Tutoring services and student academic success.

VIII. Discussion

Sembiring (2018) found that an effective online tutoring program is most impacted by the learning strategies introduced by a tutor to their tutee, followed by the program's access and ease of use. These findings align with those of Sabatino (2014) and Chibani (2014) that the development of student learning strategies through the tutoring or writing feedback process were key factors in the effectiveness of overall support. Brainfuse Online Tutoring works broadly with its higher education clients and specifically with individual students to introduce learning strategies that best meet the needs of each learner. Institutions are invited to partner with Brainfuse to customize Brainfuse content in order to match with

course learning objectives and writing standards; Brainfuse also provides diagnostic tools that align with common curriculum in developmental English and math courses.

In addition to the development and alignment of robust content across supported subject areas, Brainfuse also trains its tutors to develop effective, supportive relationships with tutees during tutoring sessions. Again, although most scholarship about tutoring best practices is written about peer tutor-tutee environments, most of the practices carry over to professional tutor-tutee best practices: establish a welcoming environment for the tutee (Matthewman, Jodhan-Gail, Nowlan, OSullivan, & Patel, 2018); ask open-ended questions that encourage discovery; and use demonstrations and practice to affirm learning and set goals (Sturman, 2018). As current and former educators and field practitioners, Brainfuse tutors use these best practices to engage learners in each tutoring session, which is recorded and accessible for students to view later for their own reference.

IX.   Conclusion

Tutoring provides support to students seeking clarity and feedback on assignments. Online tutoring leverages virtual environments to support those learners who, for whatever reasons, may be reticent to seek out in-person tutoring and at times and in places where support may otherwise be unavailable. Effective online tutoring creates a custom, welcoming learning environment that helps each student identify and achieve learning goals while also building valuable learning skills that, over time and combined with other factors, lead to academic success. The tutoring use and retention data analyzed in this study indicate that Brainfuse provides effective online tutoring: students who use tutoring also retain at a higher rate than students who do not use tutoring. Furthermore, students

who use more hours of tutoring services are more academically successful than students who use fewer or no hours of tutoring. The majority of students who took advantage of tutoring were early in their degree programs, suggesting that institutions have an opportunity to promote the value of tutoring in early courses to increase the likelihood of students' academic success and early adoption of key lifelong learning practices. Findings also suggest that students who might benefit from tutoring are also students who may not otherwise have access to professional tutoring services. Both the student satisfaction survey data and retention findings indicate that Brainfuse Online Tutoring provides critical and valued academic support to students outside of the classroom, providing trusted learning partners and content in timely, relevant, and accessible ways that support retention across programs and institutions.

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