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Active Learning Experiences to Address Student Well-Being

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Abstract. Well-being plays a critical role in student performance and engagement. The purpose of this pilot study is to describe an active and experiential learning activity and examine its effect on promoting well-being in a convenience sample of graduate students. The results of this study demonstrated that the active and experiential learning opportunities described in this article enhanced perceived well-being, including mental, emotional, and physical health. Findings from this study suggest that active and experiential learning approaches may be beneficial tools for addressing and promoting well-being for graduate students.

Enhancing student well-being is increasingly recognized as a crucial component in fostering improved academic performance and engagement in higher education coursework (Pascoe et al., 2020). Well-being is a multi-faceted construct that includes the presence of positive emotions, the absence of negative emotions, and satisfaction with daily participation (Reitz & Scaffa, 2020). A litany of factors affects a student's well-being, such as academic burnout, limited time to engage in self-care, and heavy workload (Hansen & Virden, 2022; Hogan et al., 2023; Park, 2021). As the literature expands on concerns regarding student well-being and its academic impact, there is a growing interest in exploring innovative educational strategies that integrate well-being into existing curricula (Dyrbye et al., 2019). The pedagogy of wellness serves as a vital framework for this integration, emphasizing the importance of embedding evidence-based teaching and wellness strategies into the curriculum to nurture students' holistic development (Duong et al., 2023). This framework recognizes that a student's academic success is intertwined with their physical, mental, and emotional health. Amaya and colleagues (2019) assert that faculty and staff have a responsibility to be leaders of pedagogical wellness initiatives in order to create a top-down culture of wellness. By embedding well-being concepts within existing curriculum, educators can potentially foster environments that support not only academic success but also the holistic well-being of students.

Literature Review

While some strategies to address student well-being are integrated within the classroom, institutions often implement broader wellness initiatives (Amaya et al., 2019). These initiatives enable classroom instruction to maintain its primary focus on academic content while supporting students' overall well-being through complementary programs. Approaches to addressing student well-being vary within academic settings and may include assisting students in developing stress management routines, educating students on mindfulness interventions, or utilizing educational supports, such as tutors, to reduce stress (Baus et al., 2021; Chang et al., 2021; Hogan et al., 2023; Krumholz et al., 2022). Integrating well-being strategies into existing course content provides educators with an opportunity to enrich the learning experience by aligning with institutional wellness initiatives, if present. This alignment can create a more profound and impactful educational environment within the classroom.

By embedding well-being concepts within existing curriculum, educators can potentially foster environments that support not only academic success but also the holistic well-being of students.

Active learning, supported by a growing body of research as an effective pedagogical approach (Freeman et al., 2014), is particularly suited for this integration. The instructor plays a vital role in the success of the active learning experience through the purposeful design of appropriate activities that are challenging yet manageable (Nguyen et al.,

2021). Additionally, a crucial component of active learning is that students have the opportunity to set their own personally meaningful learning goals to promote ownership of the learning process (Lee & Hannafin, 2016). Active learning fosters a deeper understanding of course content by actively engaging students through methods such as discussion, team-based learning, and case studies. It can simultaneously promote well-being when the active learning experiences are tied to components of well-being. While faculty and staff are encouraged to take charge of the initiative to promote well-being, limited evidence exists on which aspects of well-being can be targeted through active learning experiences and activities.

The Role of Sleep, Nutrition, and Physical Exercise on Well-Being

There are many factors that influence well-being; however, sleep, nutrition, and physical exercise (PE) are consistently identified as significant contributors to health (Wickham et al., 2020). Therefore, these three aspects of well-being were utilized for the purpose of this study. Sleep, nutrition, and PE are interrelated and should be addressed concurrently for optimal outcomes. For instance, engaging in PE one to two times per week can improve an individual's sleep quality, thus improving decision-making regarding dietary choices (Ji et al., 2022). Additionally, PE has been shown to improve cognitive functioning and mental health, and it can reduce stress levels, thereby decreasing symptoms of anxiety and depression, which impact well-being (Ji et al., 2022; Wickham et al., 2020). Poor sleep quality can detrimentally affect mental and cognitive functions, which are crucial for success in higher education performance. Nutrition and well-being are highly correlated, as nutrients found in food can impact mood, energy, and cognitive functioning (Verhavret et al., 2020). Despite the large body of evidence that demonstrates that sleep, nutrition, and PE are integral physical components to well-being, there remains a gap in research exploring whether active and experiential learning approaches addressing these three components within required coursework can enhance the subjective well-being of students.

Purpose of the Present Study

The pilot study outlined within this article describes and examines one way in which active and experiential learning approaches can be used to promote well-being. This study seeks to explain a novel and innovative active and experiential learning activity and measure its impact on student well-being within the domains of sleep, nutrition, and PE. While there are many components of well-being, the three domains chosen were frequently cited in research and were already being covered within course learning objectives in a graduate-level Neuroscience course and thus determined appropriate for the current study. Additionally, this study sought to gain a deeper understanding of our current student population to guide educator instructional practices in accordance with the scholarship of teaching and learning principles.

The present study will address the following research questions:

1. What is the current perception of well-being, including strategies and barriers to implementing well-being practices, in a convenience sample of graduate students?
2. How do sleep, nutrition, and physical exercise impact the well-being of graduate students?
3. How can active learning experiences be designed to effectively promote aspects of well-being?

Method

Participants

Institutional Review Board (IRB) approval was obtained prior to the start of this research study. A convenience sample of 37 first-year students enrolled in an entry-level graduate healthcare program at a Midwestern institution were asked to participate. All participants were above the age of 18 years old, though further demographic information was not obtained to ensure anonymity.

Measures

A self-created survey measuring students' perceptions of well-being and active learning as it relates to the promotion of well-being was utilized for this study. This 16-item scale measured students' perceptions of sleep,

nutrition, and PE related to well-being. Questions on this survey included a mix of Likert-scale responses and open-ended questions. See Appendix A for sample questions. The survey was administered before the start of the research study and after the research study (11 weeks later), yielding pre- and post-survey quantitative and qualitative results. Given the exploratory nature of this research, the primary intent of using a self-created survey was to understand and enhance teaching practices, rather than producing a psychometrically validated instrument. Additionally, current research highlights significant variability in the conceptualizations and psychometric properties of existing instruments that are intended to measure well-being (Cooke et al., 2016) and asserts that no exemplary instrument currently exists for this purpose. By designing a self-created survey, we tailored questions specifically to the unique context of this exploratory research.

Research Design

This study utilized a mixed methods design in which a pre- and post-survey was used to gather quantitative and qualitative data. Pre- and post-survey data was analyzed after the conclusion of this research study. Quantitative analysis utilized an unpaired sample t-test method to compare pre- and post-survey results. The qualitative analysis utilized conventional content analysis in which transcribed data was coded, themed, and quantified independently by the three researchers to ensure diverse perspectives and minimize bias. The triangulation process involved comparing and discussing individual analyses to reach consensus on themes, thereby enhancing the credibility of the findings. Furthermore, saturation was considered in the qualitative analysis by continuing data collection until no new themes emerged from the open-ended responses, ensuring a comprehensive understanding of the student perceptions of well-being and active learning.

The pre- and post-survey design was particularly valuable in this study, as it allowed for within-subject comparison of well-being metrics before and after engaging in the active learning experiences. It is important to note that it was not feasible to incorporate a control group in this pilot study due to the purpose of the class assignment and the potential for a control group to reduce the equal opportunity for all participants to engage in the same learning experience. The current design enabled the researchers to capture both qualitative perceptions and quantitative data without compromising the integrity of the course content and student learning experience.

Procedures

As part of the didactic coursework within the 16-week Neuroscience course, students were required to complete a series of three large-scale assignments directly related to course content within the topics of sleep, nutrition, and PE. Each large-scale assignment was divided into three modules that include a learning component, a lived experience, and a clinical application component relevant to their healthcare profession program for each of the domains of sleep, nutrition, and PE. Due to the scale and intensity of each of the three large-scale assignments, students were given approximately four weeks outside of typically scheduled lecture time to complete each of the learning assignments sequentially. For example, students completed modules 1, 2, and 3 for the sleep assignment over the span of four weeks before proceeding to completing modules 1, 2, and 3 of the nutrition assignment during the next four weeks.

The purpose of the first module within each learning assignment was to provide students with in-depth knowledge of the three topics of study (sleep, nutrition, and PE) using evidenced-based sources in the form of research articles, podcasts, case studies, and/or videos. All learning materials were provided by the course instructor, following a scaffolded learning approach; however, students had the ability to self-pace through this learning module. After students completed their in-depth learning module, a formative assessment was utilized to monitor student learning and understanding (see Appendix B for an example of formative assessment questions for the first module for sleep). The first module within each learning assignment favored traditional approaches to learning and did not integrate active and experiential learning. The purpose of this approach was to ensure students had a basic understanding of each of the components (sleep, nutrition, and PE) before proceeding to the next portion of the larger learning assignment.

The second module focused on engaging in a lived experience of the topic of study (sleep, nutrition, or PE). The lived experience within this portion of the assignment series highlights the active and experiential learning component. Students individually selected personally meaningful short- and long-term goals for each of the three study topics. Importantly, students worked on only one topic at a time, completing the large-scale assignment and its

modules sequentially rather than concurrently. This approach ensured that each topic was addressed in isolation, allowing students to fully immerse themselves in the lived experience of one domain without the distraction of simultaneously managing goals in other areas. Students constructed goals for each topic of study (sleep, nutrition, and PE) that followed a specific goal-writing method and were expected to be measurable and achievable within the timeframe they were given, which was typically 7-14 days within the four weeks allotted to each large-scale assignment. After setting their goals, students actively worked toward their goals for the designated span of time. Student goals differed greatly within this module, as students were given the opportunity to self-select meaningful goals as long as they related to the topics of study. Following the indicated span of time, students reflected on their goals using instructor-provided reflection prompts that included analysis of the success of meeting their goals and idea generation of how to grade goals up or down based on their measure of success (see Appendix C for an example of the assignment description used to complete the second module for nutrition). It should be noted that students were not graded on their ability to meet their goals; rather, they were graded on their ability to construct goals that followed the specific goal-writing method given to them and their thoughtful reflection of whether they achieved their goals.

The purpose of the third module of each learning assignment was to connect the topic of study (sleep, nutrition, and PE) to the student's future professional career within healthcare. Students integrated their learned knowledge of the topic and their lived experience to case studies that required them to analyze the utility and relevance of each topic for their career (see Appendix D for an example of the assignment description used to complete the third module for PE). Following the completion of each assignment series, students reflected on their knowledge, lived experience, and professional application in both written form and orally during in-class discussions.

Before the first assignment was administered within the Neuroscience course, students were notified of the purpose of this research study. Participation in this study was voluntary and anonymous; however, completion of the learning assignments was a required component within the course. Implied consent was obtained before participants completed the pre- and post-survey on Qualtrics. If participants did not consent, they were directed to the end of the survey, and data was not collected. Participants completed the survey during normally scheduled class time, with a faculty member who was not involved in the study present to oversee the process.

Results

Qualitative Findings

Of the 37 students asked to participate, 36 completed the pre-survey, while 33 completed the post-survey. Participants were asked, "What strategies do you currently use to promote well-being?" Qualitative responses from this question were compiled into an electronic document with all qualitative data. These responses provided rich insights into student well-being strategies. However, upon analysis, it became evident that several recurring themes could be quantified to enhance understanding of the data. To analyze qualitative responses, an iterative coding process was employed. Three researchers independently coded responses by identifying specific segments of text that represented distinct ideas or concepts. This initial coding focused on labeling these segments with codes such as "running" and "talking to friends." After completing their individual coding, the researchers convened to triangulate their results. This involved comparing their codes and discussing any discrepancies to reach consensus on the final codes. From this process, key themes emerged, representing broader categories that encapsulated the coded responses. For example, the codes "running" and "talking to friends" were grouped under the overarching theme of "physical exercise" and "social interaction." The identified themes were then quantified by counting the frequency of mentions across responses, allowing for a more precise depiction of their significance among participants for both pre- and post-survey results, as seen in Table 1 (see p. 5). While the themes that emerged from pre- to post-survey were the same, there was an increase in the number of students post-survey who reported using sleep, nutrition, and PE strategies to promote well-being. Within the qualitative responses, it should be noted that the response values do not equate to the number of participants, as data was coded for major themes. Some individuals had none or a significant amount of strategies and barriers listed within their responses.

Participants were also asked, "What barriers do you face in implementing strategies that might promote well-being?" Themes from this question were derived using the same process of iterative coding and triangulation as described above. Unlike the "strategies to promote well-being" findings, themes from this question emerged differently between pre- and post-survey results. Therefore, findings from this question are broken into two tables: Table 2 includes pre-survey data, while Table 3 includes post-survey data (see p. 5).

Table 1

Strategies Used to Promote Well-Being

Themes	Participant Statements to Support Themes
Exercise	"I am also tracking my daily step count to promote physical wellbeing."
Pre: n = 20, Post: n = 27	"I work out at least four times a week."
Social Interaction	"Time to socialize and be around the people I love."
Pre: n = 20, Post: n = 15	"Try to socialize with friends or family as often as I can."
Engagement in Leisure and Self-Care	"Take time for myself to do the things I love."
Pre: n = 19, Post: n = 5	"I have started doing deep breathing when I get overwhelmed."
Sleep	"I do my best to get enough sleep."
Pre: n = 12, Post: n = 20	"I've been trying to better regulate my sleep by tracking it."
Nutrition	"I try to eat food that make me feel good (such as salads)."
Pre: n = 3, Post: n = 16	"Do my best to eat as healthy as possible."

Table 2

Barriers to Implementing Well-Being Strategies (Pre-Survey)

Themes	Participant Statements to Support Themes
Time (n = 26)	"I just don't feel like I have enough time for myself."
	"There's not enough time in the day to get rest, exercise, etc."
Workload (n = 12)	"The amount of work that we have to do on top of having a job is difficult."
Guilt (n = 4)	"Feeling that I shouldn't be hanging out but instead doing school related work instead."
	"Feeling like taking time for myself is bad because I feel like I should be doing school work instead."
Financial Constraints (n = 3)	"Finance concerns."

Table 3

Barriers to Implementing Well-Being Strategies (Post-Survey)

Themes	Participant Statements to Support Themes
Time (n = 26)	"Lack of time to give sufficient attention to healthy habits."
	"Grad school and work makes it difficult for me to take time to take care of myself."
Lack of Motivation (n = 7)	"Sometimes motivation can be a barrier if I am feeling overwhelmed."
Financial Constraints (n = 5)	"Finances are another barrier for nutrition because healthy foods are more expensive."

Quantitative Findings

An unpaired sample t-test was used to analyze pre- and post-survey quantitative data. The pre-survey assessed baseline stress and health ratings, as well as agreement ratings related to sleep, nutrition, and PE, while the post-survey evaluated any changes in these factors following the completion of the active learning experiences. All numerical data was compiled into Microsoft Excel. An unpaired t-test analysis was used to determine whether there

was a statistically significant difference in pre- and post-survey responses. Statistical significance was determined using a p-value threshold of <0.05.

The researchers aimed to gain insights into students' perceptions of their current stress levels and overall health, encompassing mental, emotional, and physical health, both prior to and following the completion of active learning experiences relating to sleep, nutrition, and PE. By evaluating these perceptions, the researchers sought to determine whether the active learning experiences could contribute to improved perceived health and a reduction in stress levels among the participants. Participants were asked, "Within the past 7 days, how would you rate the following, with 1 being 'extremely bad' and 5 being 'extremely good.'" Results indicated that participants reported less stress and improved mental, emotional, and physical health after the completion of this research study (Table 4).

Table 4

Comparison of Pre-Survey and Post-Survey Stress and Health Ratings

	Pre-Survey[a]		Post-Survey[b]		*t*	*p*
	M	*SD*	*M*	*SD*		
Stress level related to school and coursework	1.92	0.81	2.82	1.01	4.06	0.00*
Mental and emotional health	2.81	1.06	3.55	0.83	3.23	0.001*
Physical health	3.31	1.19	3.70	0.88	1.56	0.064

Note. M = mean, *SD* = standard deviation, $n^a = 36$, $n^b = 33$, $*p = < 0.05$

Numerous components of sleep, nutrition, and PE were analyzed to better understand participant perceptions and understanding of these domains and their impact on well-being before and after the completion of the active learning experiences addressing these domains. The data presented in Table 5 provides a snippet of participant responses when rating their agreement with the questions prompted, with 1 being "strongly disagree" and 5 being "strongly agree." Table 5 does not display all questions from the survey; instead, it highlights those that yielded the most significant insights relevant to our research objectives. This selective presentation allows for a clearer focus on the key findings that emerged from the data analysis. Ultimately, results from these findings indicate that after the completion of this study, the sample of graduate students demonstrated improved sleep, nutrition, and PE habits, as well as an improved understanding of how sleep, nutrition, and PE impact well-being.

Table 5

Agreement Ratings for Sleep, Nutrition, and PE

	Pre-Survey[a]		Post-Survey[b]		*t*	*p*
	M	*SD*	*M*	*SD*		
I get enough sleep each night	2.89	1.26	3.58	1.25	2.27	0.013*
I understand the effect of sleep on my body	4.53	0.61	4.97	0.17	4.17	0.000*
Sleep impacts my well-being	4.86	0.42	4.97	0.17	1.41	0.088
I engage in healthy eating practices	3.31	1.01	3.85	0.76	2.54	0.007*
I understand the effect of good nutrition and diet on my body	4.47	0.70	4.91	0.29	3.45	0.001*
Nutrition impacts my well-being	4.42	0.73	4.94	0.24	4.05	0.000*
I get enough exercise each week	2.83	1.52	3.88	1.24	3.14	0.001*
I understand the effect of exercise on my body	4.64	0.54	4.97	0.17	3.47	0.001*
Physical activity impacts my well-being	4.58	0.73	5.00	0.00	3.42	0.001*

Note. M = mean, *SD* = standard deviation, $n^a = 36$, $n^b = 33$, $*p = < 0.05$

Finally, participants were asked to rate their agreement with the following statement: "Active learning experiences can improve my well-being." The analysis revealed a statistically significant improvement in the agreement ratings to this question from pre-survey (M = 4.11, SD = 0.92) to post-survey (M = 4.76, SD = 0.61), with a t-value of 3.46 and a p-value of 0.001. This finding indicates that the active learning experiences positively impacted participants' perceptions of their well-being, suggesting that such interventions may effectively enhance students' overall health and wellness.

Discussion

This study aimed to explore the effectiveness of active and experiential learning approaches in promoting well-being among graduate students. Specifically, this research examined the impact of a novel learning activity on student well-being, focusing on three critical domains: sleep, nutrition, and PE. These domains were selected due to their frequent citation in existing literature and their alignment with the learning objectives of the graduate-level Neuroscience course in which the study was conducted. In addressing the research questions, this study aimed to uncover the current perceptions of well-being among graduate students, including the strategies they employ and the barriers they face in implementing well-being practices. Additionally, it sought to investigate how sleep, nutrition, and PE can be effectively integrated into coursework to promote student well-being. The aims of this study were addressed by completing a series of assignments that incorporated active learning techniques, including personally meaningful goal setting and a lived experience of working toward those goals in the domains of sleep, nutrition, and PE. Each research question is addressed separately below:

1. What is the current perception of well-being, including strategies and barriers to implementing well-being practices, in a convenience sample of graduate students?

The data revealed that many students utilized well-being strategies, such as exercise, social interaction, and leisure engagement, both before and after this research study. Notably, the prevalence of these strategies increased significantly for the domains of sleep, nutrition, and PE, suggesting that the learning activities implemented during this study played a crucial role in this change. One possible explanation for this increase is that the structured learning activities provided students with opportunities to deepen their understanding of well-being factors, which in turn fostered intrinsic motivation to integrate these aspects into their daily life. Bailey and Phillips (2016) assert that intrinsic motivation is a large contributor to student engagement, general motivation, and enhanced subjective well-being, which is consistent with findings from this study.

Participants of this study identified numerous barriers to engaging in and implementing well-being strategies. The most prevalent barrier cited by participants of this study was decreased time (due to academic commitments) and/or difficulty with time management. This finding supports prior research indicating that students often spend more time engaging in academic activities, which can ultimately increase stress levels and disrupt occupational balance and participation in daily activities that promote well-being (Poleshuck et al., 2020; Porath & Rosenblum, 2019). However, incorporating well-being strategies as part of existing curricula using active learning experiences may offset this barrier and in turn promote student engagement in academic coursework and well-being strategies simultaneously.

Baseline data gathered from this study indicated that students perceive high levels of stress related to school and coursework, as well as poor mental and emotional health. Grab and colleagues (2021) found that personal, financial, and academic obligations often caused high stress levels in graduate healthcare students. Much research has cited the need for graduate healthcare programs to implement well-being programs or offer additional support for students to decrease stress, reduce the risk of burnout, and support overall student well-being (Grab et al., 2021; Smallfield et al., 2022). Findings from this study may offer an effective means of incorporating such supports into typical coursework.

2. How do sleep, nutrition, and physical exercise impact the well-being of graduate students?

Data collected from this research study supported the notion that sleep, nutrition, and PE significantly impact well-being. With regards to sleep, Wickham et al. (2020) found that sleep quality was the most significant predictor of depressive symptoms and well-being, with sleep quantity being the second largest predictor. Participants in this study

indicated a 10% increase in their ability to sleep uninterrupted at night. Additionally, there was a 23.8% increase in students reporting they receive enough sleep each night. These significant changes could be attributed to increased knowledge of the recommended amount of sleep and the lived experience of increasing healthy sleeping habits and routines.

The nutrition domain demonstrated the most significant increase from pre- to post-survey data for its perceived impact on overall well-being. Research continues to support the direct impact of diet on physical and mental health, including anxiety and depressive symptoms (Firth et al., 2020). Dietary choices have also been found to correspond to cognitive functioning, mood, and neuroplasticity potential (Pickersgill et al., 2022). While this study did not promote or discourage specific dietary interventions, participants were educated on the impact of nutrition on cognitive health and behavior. Subsequently, the participants created and implemented individualized goals for themselves based on the nutrition education provided. It can be inferred that a deeper understanding of nutrition's impact influenced the participant's dietary goals, leading to an enhanced sense of well-being.

Similarly, concerning PE, students reported a 36.9% increase in engaging in their perceived amount of needed exercise per week. This change was consistent with a 27.3% increase in students reporting they exercise three times or more per week from pre- to post-survey responses. Ji et al. (2022) demonstrate that exercise intensity has more significant effects than exercise frequency, though both intensity and frequency were shown to reduce anxiety and depressive symptoms. Although this study did not examine exercise intensity, results indicate that an increase in frequency alone positively impacts subjective well-being in this population.

Although baseline data indicated that graduate students had reduced levels of mental and emotional health, participants reported a 26.4% increase in their mental and physical health at the completion of this research study. This finding was consistent with research that demonstrates sleep, nutrition, and PE impact mental health and well-being (Wickham et al., 2020). Similarly, subjective stress ratings decreased in post-survey data by 47%, supporting the notion that increased knowledge of these healthy lifestyle behaviors and implementation of a personally meaningful lived experience focused on these domains can positively impact overall well-being.

3. How can active learning experiences be designed to effectively promote aspects of well-being?

The design of the learning activities adhered to established best practices of active learning, including setting clear expectations, providing encouragement to students, and aligning learning activities with course objectives (Nguyen et al., 2021). Additionally, the active and experiential learning activities employed within this study utilized scaffolding techniques and facilitated supported self-directed learning (Shekhar et al., 2020). In addition to the design of the active and experiential learning opportunities, it was noted that students discussed their personal well-being goals with peers, creating an environment of accountability and support throughout the duration of the study. This collaborative approach not only enhanced student motivation but also empowered students to take greater ownership of their well-being. Consequently, the combination of intrinsic motivation, effective learning strategies, and peer accountability likely contributed to the objective increase in the implementation of well-being practices among participants.

When analyzing the responses regarding active learning and its association with student well-being, there was a 15.7% increase in students who felt that active learning experiences focused on domains of well-being had the potential to improve their well-being from the pre- to post-survey. This finding indicates that active and experiential learning opportunities focusing on the domains of sleep, nutrition, and PE can positively impact well-being and could be a promising avenue for educators. Furthermore, findings from this study indicate that when graduate students are informed of healthy lifestyle factors that impact well-being and consistently prioritize their well-being, there is an increase in physical, mental, and emotional health, as well as a decrease in perceived stress. Overall, these findings highlight that active learning approaches can effectively promote well-being among students, reinforcing the importance of integrating such strategies into educational practices.

The present study focused primarily on physical wellness components, including sleep, nutrition, and PE. However, it is important to recognize that well-being encompasses multiple dimensions. The National Wellness Institute (2024) identifies six domains of wellness, including intellectual, occupational, emotional, social, and spiritual. To enhance the broader applicability of active learning experiences, educators can adapt the principles demonstrated in this study to address other dimensions of well-being within diverse academic contexts. For instance, peer mentoring, a practice utilized often in higher education, has been proven effective at reducing student stress and improving social integration, directly addressing the social domain of well-being (Van der Zanden et al., 2018). Similarly, intellectual

well-being can be enhanced through active learning strategies such as case studies or role-playing, which foster critical thinking and complex problem-solving skills (Bhattacharjee & Ghosh, 2013; Popil, 2011). Mujallid (2024) found that digital active learning strategies can effectively improve the social and emotional well-being of students. These examples demonstrate that the principles of active learning can be tailored to support a wide range of well-being domains, providing opportunities for all educators to incorporate aspects of well-being into their coursework.

Limitations and Future Research

While findings from this study demonstrate promising implications for using active learning to promote well-being, some limitations should be addressed. This study included a small sample size with presumably minimal variations in age and gender. Although this was a pilot study, future studies will expand the sample size to better represent the population at large. This study was also completed during the students' first year of graduate school, where students were enrolled in 18 credit hours for that semester. Perception of well-being may evolve throughout the duration of graduate school, and the number of credit hours enrolled per semester could also contribute to different perceptions of well-being. Future studies will represent students at all stages of their academic journey.

Regarding the study's premise, students were asked questions about sleep, nutrition, and PE, which could have primed them to consider these aspects before participating in the active learning assignments. This could cause results to vary if students were not asked the survey questions prior to completing the assignments.

It should be noted that students were required to complete the series of active learning assignments regarding sleep, nutrition, and PE for the purpose of their coursework. While this does not serve as a limitation, it is an essential consideration for future research, as the graded course requirement may have served as an extrinsic motivator that altered student engagement and participation in promoting their own well-being. Future research could consider the longevity of students implementing the strategies they learned through the active learning assignments described in this study. Finally, it would also be helpful to investigate the effects of other learning approaches or even other factors (e.g., relationships, social support, finances, etc.) that target well-being beyond the scope of sleep, nutrition, and PE.

Additionally, a limitation of this pilot study was the absence of a control group to assess student perceptions of well-being without the active learning activities described in this research. Future research should consider including a control group to strengthen the causal claims of the study and provide a more robust comparison of the effects of active learning activities on well-being.

Conclusion

This study underscores the potential of active and experiential learning approaches to enhance student well-being, particularly in the domains of sleep, nutrition, and PE. The findings of this study may contribute to pedagogical wellness initiatives for faculty and staff wishing to implement practical well-being strategies into their courses. By integrating these well-being components into the existing curriculum, educators can create a more holistic and effective educational experience that not only addresses academic performance but also supports the mental, emotional, and physical health of students. Furthermore, the principles demonstrated in this study extend beyond the immediate context of physical well-being, offering a framework that can be adapted to address other well-being dimensions. The findings suggest that when students are actively engaged and set personally meaningful goals related to components of well-being, they experience improvements in their overall health and reduced stress levels. While this study provides promising evidence for the benefits of such educational strategies, further research is needed to explore long-term impacts and to expand the current findings. As institutions continue to prioritize student well-being, active learning frameworks can serve as a valuable tool in fostering a supportive and enriching learning environment.

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Appendices

Appendix A

Pre- and Post-Survey Sample Questions

Question: On a scale from 1 to 5 (with 1 being "definitely not" and 5 being "definitely yes") what factors impact your well-being as a graduate student?)

	Definitely not	Probably not	Might or might not	Probably yes	Definitely yes
Diet/Nutrition	○	○	○	○	○
Sleep	○	○	○	○	○
Exercise/Physical Activity	○	○	○	○	○
Social support system (family, friends)	○	○	○	○	○
Support from your instructors	○	○	○	○	○
Demands outside of your coursework (such as job, family commitments, etc.)	○	○	○	○	○

How do you define wellbeing?

What strategies do you currently use to promote wellbeing?

What barriers do you face in implementing strategies that might promote wellbeing?

Appendix B

First Module Formative Assessment Example for Sleep

1 Multiple Answer 1 point

Which of the following may be impaired as a result of lack of sleep? Select all that apply.

- [ ] memory
- [ ] coordination
- [ ] reaction time
- [ ] vision

2 True or False 1 point

T/F: sleep deprivation decreases the ability of the brain to make new memories due to decreased activation of the hippocampus

- ○ True
- ○ False

3 Multiple Choice 1 point

The disruption of deep sleep is a contributing factor to:

- ○ increased neural plasticity
- ○ cognitive decline
- ○ improved long term memory retention
- ○ neuronal regrowth

Appendix C

Second Module Assignment Example for Nutrition

Part 1: Make a Goal!

After you have thoughtfully reflected on your nutrition needs, write 1 LTG and 2 STGs using the COAST method. Your goals should fall under the domain of nutrition in some capacity (everyone will have very different goals and that's ok!). The timeframe of your LTG should be 7 days. Your STGs should have a clear link for how achievement of these goals will help you progress toward your LTG. All goals should be measurable.

For the next 7 days, work toward your long term goal and corresponding short term goals. As you are working toward your LTG, you can begin to complete Part 2.

1. LTG:
    a. STG 1:
    b. STG 2:

Part 2: Connection to Neuroscience

1. Think about your LTG and STGs. What connections can you make with neuroscience that are related to your goals? Your answer should be 4-5 sentences long and utilize at least one peer-reviewed journal article.
    a. *ex: if your LTG is to eliminate alcohol from your diet then you could research the effect of alcohol on the brain for your response; if your LTG is to add more protein to your diet then you could research how protein impacts brain function, etc.*

2. Provide the APA citation for the journal article you selected.

After you have worked toward your LTG for 10 days, you may proceed to Part 3.

Part 3: Nutrition Goal Reflection

1. Why did you select the LTG/STGs in Part 1? Explain the relevance of these goals (to the extent that you're comfortable doing so) to your life, health, and/or occupations.

2. Did you meet your LTG and STGs? If no, explain how your goals could be modified for feasibility/appropriateness to your lifestyle.

3. Describe any facilitators or barriers to achieving your LTG.

Appendix D

Third Module Assignment Example for PE

Case Study

Rob is a 67-year-old who recently experienced a TIA (transient ischemic attack) that resulted in mild cognitive impairment (MCI) as well as decreased strength in his right upper extremity. Rob is currently taking a leave of absence from his work as an accountant while he manages his health and attends therapy. He is frequently accompanied to his therapy sessions by his wife, Stacy. Per Rob's report and in his doctor's notes, you find that Rob has no precautions or contraindications.

During your initial evaluation with Rob, you discover that he enjoys reading, he works 9-hour days in his office, he plays card games on his computer in the evening, and he and Stacy have a shared interested in bird watching, which is an activity they do together frequently. From this evaluation you gather that Rob's activities are primarily sedentary, and he does not exercise. Based on what you know about the brain and exercise, you want to engage in a conversation about the benefits of exercise, especially as they relate to his recent TIA with secondary MCI.

1. How do you explain to Rob (and Stacy) that cognitive function and exercise are highly correlated? Write your response as if you were explaining this to Rob and Stacy. 2 paragraphs

2. After you explain the benefits, Rob and Stacy tell you that they have discussed exercising together even before Rob's TIA but didn't know what types of exercise would be beneficial or where to even start with implementing an exercise routine. Using the COAST method, write one LTG and 3 corresponding STGs that are focused on exercise. While writing your goals, ensure that you are considering everything you know about Rob, and that you have tied the goals back to occupation*.

*Since you have likely never written a goal quite like this, I have included one STG example (this example may not be used in your submission): *STG: Ct will create weekly exercise action plan with min assist to address health and cognitive function required for return to work and continued independence by 2 weeks.*

   a. LTG 1:
      i. STG 1:
      ii. STG 2:
      iii. STG 3:

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