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Based on active learning theory, students learn best when they are involved in the teaching-learning exchange. Kinesthetic and active classrooms have been found to increase student learning and engagement within K-12 learning environments. Yet few kinesthetic learning environments exist for students in college and university settings. The purpose of this study was to understand the process needed to create a kinesthetic classroom for a university, including the perceptions held by faculty and students in this context. This was done by examining current best practices involved in using an active or kinesthetic classroom, and through an exploratory case study developing a framework for the implementation process. Analysis of faculty and student responses, triangulated with statements from experts (those who have already implemented the novel learning space), revealed 14 subthemes. Those subthemes were prioritized into major themes to develop a framework for implementing the new learning environment in the context of higher education. The framework involves the 6-P's: Probe, Plot, Plan, Prepare, Practice, and Prove. Each theme within the framework addresses issues in order of need to implement an active or kinesthetic classroom. Further research is needed to provide support for the framework structure. This project was significant in that it addressed the use of active and kinesthetic learning changes novel to higher education.

TRANSITIONS IN UNIVERSITY LEARING ENVIRONMENTS:

MOVING TOWARDS A KINESTHETIC MODEL

by

Meaghan Kelly Howard

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the Faculty of The Graduate School at
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I dedicate this work to my husband and ex-officio member of my committee, Christopher "Doc" Howard, whose love, encouragement, and support during this process has helped me to achieve more than I thought possible.

I also dedicate this to my son, Hunter, for making me laugh and keeping perspective through this process. Finally, I want to thank my parents, Kevin and Bev Kelly, for their love and support during this season.

APPROVAL PAGE

This dissertation written by Meaghan Kelly Howard has been approved by the following committee of the Faculty of The Graduate School at The University of North Carolina at Greensboro.

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CHAPTER I

PROJECT OVERVIEW

Many faculty in higher education are concerned with innovative strategies to engage students in the classroom. A learning environment that allows students the flexibility to choose a variety of postures during academic lessons is one way to do so. An "active permissive environment" (Lanningham-Foster, et al., 2008, p. 1849; also referred to as moving or kinesthetic classroom) is a simple approach to learning and engagement that allows students to decide if they learn best in a seated or active posture (i.e. standing, moving, or balancing). Based on active learning theory, pedagogy that involves students in the learning process and encourages participation is more effective than passive listening (Bonwell & Eison, 1991). Kinesthetic classrooms expand this theory to incorporate actual movement for a brain and body connection during academic courses (Blaydes, 2000). Both active and kinesthetic classrooms can include various forms of flexible seating and moving workstations; they range from simple options such as moveable chairs or standing desks, to more complex options like cycling desks, glider desks, stepper desks, or wobble stools to promote balance and core muscle strength. Many of these active workstations have been successfully implemented in K-12 school classrooms (Hinckson, et al., 2015). Additional studies support the use of standing desks as an effective classroom tool to promote increased learning and engagement for college students as well. Yet, few moving or kinesthetic classrooms options exist for students in

college and university settings. Higher education research needs more evidence to determine if and how these active learning environments can contribute to increased student-centered learning and engagement.

Review of Relevant Literature

There is an important connection between movement and how the brain works to process information. When students sit inactive for more than 20 minutes the processing of information declines (Kinoshita, 1997). Modern trends in sedentary behavior seemingly disregard the link between movement and cognitive function (Vaynman & Gomez-Pinilla, 2006). This trend has prompted researchers to ask if changes to the physical learning environment could reduce sedentary behaviors and benefit student learning (Lanningham-Foster et al., 2008). One way educator's are responding is by leveraging the use and design of the classroom space. Kinesthetic classrooms provide opportunities for increased movement during lessons through the use of innovative pedagogy or classroom design (Lengel & Kuczala, 2010). Many students entering college today have already been exposed to kinesthetic-type classrooms during their K-12 school years (Hinckson et al., 2016). Yet this innovative practice to classroom learning and engagement is not currently available at their college or university. Despite the popularity and effectiveness in the K-12 setting, the problem remains that few moving or kinesthetic classrooms exist on college and university campuses.

Active learning models place students in the center of the teaching-learning process by providing them with intentional opportunities to interact in the learning and participate in constructing knowledge and concepts. When student-centered processes are

used, improvements are noted in academic achievements and attitudes (Armbruster, Patel, Johnson, & Weiss, 2009). While active learning pedagogy enhances peer and instructor collaboration and interaction (Van de Bogart, 2009), it still overlooks the value of physical movement to enhance cognition for the learning process (Vaynman & Gomez-Pinilla, 2006). Movement during class time provides students and teachers with a more stimulating experience (Lengel & Kuczala, 2010). Movement prepares the brain for learning and aids students to connect and process information more efficiently (Blaydes, 2000). During learning the brain takes in information and links it through both implicit and explicit learning. Typical school work focuses on explicit learning, skills that involve rote memorization; however, implicit learning happens intuitively as the brain is making connections between the information, context, and environment (Frensch & Rünger, 2003). Implicit learning relies on a level of attention given during lessons (Seger, 1994), and is driven by body movement.

Several benefits occur as a result of allowing movement in the classroom. Research on the neurocognitive benefits of moving classrooms found improvements in skills associated with learning, reasoning, and comprehension (Mehta, Shortz, & Benden, 2015). In active office spaces, researchers evaluated executive function of participants and measured work-effectiveness and productivity. Executive function is the cognitive ability to problem solve, reason, or plan; all skills similarly utilized in learning. Results showed tasks unaltered while using an active workstations (Ehmann et al., 2017). These results help justify the use of kinesthetic classrooms, as these spaces may unlock increased student attention and engagement in college courses (Blake, Benden, & Wendel

2012). This further suggests a significant student-centered learning model (Fede, 2012) to facilitate increases for engagement and learning during class time by simply allowing students to stand or engage in basic movement. Additional evidence suggests that breaking up sedentary time yields health benefits (Healy et al, 2015). In active permissive environments people are active in several different ways: a) reduce sitting time (Clemes et al., 2016); b) increase steps per day (Benden et al., 2014) c) facilitate greater calorie expenditure (Blake et al., 2012); and d) produce more dynamic postures when sitting (Aminian et al., 2015). These studies offer substantial reasons to use kinesthetic classrooms to address sedentary behavior while enhancing learning.

Active learning classrooms allow increased student collaboration and interaction with peers and instructors. These classrooms are being used to promote student-centered practices in all levels of education (Adedokun et al., 2017). Yet what is still missing from this design is the standing or movement to optimize learning strategies. While moving classrooms are popular in K-12 schools, few studies have looked at this approach in a college or university setting. Only the use of standing desks in a collegiate classroom has been studied to determine if the idea would generally be accepted by students and faculty. While these results indicate favorable attitudes towards standing desks (Benzo et al., 2016) additional studies on kinesthetic workstations needs to be done.

A recent trend on university campuses includes building or remodeling spaces to support instruction. It is the responsibility of universities to provide an optimal environment to facilitate student-centered learning (Adedokun et al., 2017) and support

new approaches for student engagement (Axelson & Flick, 2010). Student engagement is defined as the "time and energy" students put into academic tasks (Kuh, 2003). This is a key interest of university faculty to promote in class learning and participation. This project looks to create an environment conducive to increasing both student learning and engagement. Kinesthetic classrooms have the potential to impact student learning and engagement, as engagement may be a result of the actual learning environment (Axelson and Flick, 2010).

Purpose and Aims

The purpose of this study was to understand the process needed to create a kinesthetic classroom for a university, including the perceptions held by faculty and students in this context. It was accomplished with the following aims:

Aim #1: Examine current best practices for active and kinesthetic classrooms used in higher education. By exploring other universities' active and kinesthetic learning environments, I gathered relevant information on the process and design of novel learning spaces currently emerging within higher education.

Aim #2: Develop a framework for implementing an active or kinesthetic classroom within higher education. By assessing input from students and faculty at My University, and comparing it to the experts responses at various sites, I developed a process for creating an active or kinesthetic classroom for a university campus.

Methods

An exploratory case study was conducted at My University to explore perceptions that may drive the implementation process for a kinesthetic classroom. Case studies are

effective for exploratory studies and empirical evaluation in teaching design (Teegavarapu, Summers, & Mocko, 2008). Multiple sources of data were used to provide deep understanding of variables that influence the process and acceptability of change (Yin, 2014). By using principles from asset-based community development (ABCD), an institution identifies internal resources that contribute to employing innovative practices (Kretzman & McKnight, 1993). This approach is driven by internal relationships with the key stakeholders, and is best conducted by an internal member of the institution with both understanding and access to resources (Kretzman & Mcknight, 1993). Approval by the Institutional Review Board of the University of North Carolina at Greensboro and My University occurred prior to participant recruitment.

Researcher's Role

Within qualitative research the values, assumptions, and biases of the researcher need to be identified at the start of the study. My views of kinesthetic classrooms and the value has been shaped over the last three years as a doctoral candidate in kinesiology. Due to extensive review of the literature, I bring certain biases to this study. Although efforts were taken to safeguard objectivity, my biases may shape the way I view or interpret the data. As I worked closely with the members of the dissertation committee they provided ongoing "critical" review of the data analysis process.

Site Visits

Site visits were conduct at three regional universities already using active or kinesthetic classrooms, to gather evidence of current best practices and design for innovative classrooms used within higher education. A line of inquiry provided the

framework protocol for data collection (Yin, 2014). Using multiple sites and answering the same questions was done to strengthen the generalizability of the information while preserving individual accounts of each site (Herricott & Firestone, 1983).

Data Collection. To gather information on best practices in active learning spaces, I conducted three site visits in the fall semester of 2018 to directly observe the use of novel learning environments and how students and faculty acted within the space (Yin, 2014). Three universities were among the first to establish either an active learning space or a kinesthetic classroom in the southeast region, Universities A, B, and C. The goals for the active and kinesthetic classroom site visits were to a) tour the space, b) take pictures, c) observe behaviors in the space, and d) conduct informal open-ended interviews with faculty and administrators (Appendix A). Class time observations were allowed at University A and C, and faculty and administrator informal interviews occurred at each site. The site visits allowed firsthand experience with novel learning environments. Each site visit was used as a single case and organized around specific protocol questions (Yin, 2014) to provide unique examples and evidences of the reality (Creswell, 2003) of effective innovative learning spaces. Following each site visit, specified protocol questions (Appendix B) were answered. The data were recorded and stored online in a Google Form. A detailed narrative was developed from these data (Appendix C-E). Additionally, the data collected during site visits were used to develop surveys for faculty and students at My University.

Data Analysis. Analysis using inductive technique was used to provide a descriptive explanation regarding lessons learned from the site visits. The analysis

reflected answers to protocol questions, what was known as a result of the visit, and what still needed to be explored (Yin, 2014). The narratives from site visits were used to identify consistencies or common features present between each site. Using the three sites allowed for cross-site comparisons. Consistencies found between the three independent sites created convergence points for the data (Yin, 2014), thus providing trustworthiness. Site visit interview responses were used in Aim 2 as expert statements to triangulate themes that developed.

University Surveys

To develop a framework for implementing an active or kinesthetic classroom within higher education, it was necessary to assess the input of faculty and students. The rationale for this aim was to gather evidence of themes that may guide the process towards implementation. While innovative learning spaces are readily being developed on college campuses to promote collaboration and engagement, an effective process for this change has yet to be determined. It is expected this framework can serve as a guide to be used by other institutions.

Data Collection. My University is a private, coeducational institution with just over 2,000 undergraduate students. Institutional diversity is comparable to national averages: 35% of the undergraduate are of minority race or ethnicity; 60% percent are female; over 100 students represent 24 different countries.

Student participants. All undergraduate students, regardless of major, must take Physical Education (PE) 101, Personal Health and Wellness. Since curriculum within kinesiology-related courses is geared toward increasing physical activity both in

knowledge and practice, this provided a rational place to conduct the study. Using students enrolled in this course ensured a cross-section of students who vary by age, major, year in school, gender, ethnicity and race. Student participants were recruited from those enrolled in PE 101 for the fall 2018 semester; this included over 550 students in more than 20 sections of the course. All students enrolled in PE 101 were asked to participate in the survey; 100 responses were needed to ensure validity.

Faculty participants. The School of Sport Sciences has 10 full-time faculty and approximately 15 adjunct faculty who teach in undergraduate program areas. All 25 members of the faculty were asked to participate in the survey. Four professors were asked to participate in an informal interview to further discuss issues associated with a kinesthetic classroom in teaching practice.

Survey Instruments. Separate surveys were developed for both faculty and students (Appendix F-G). Images and descriptions collected during the site visits (Aim #1) were used to create both open-ended and Likert-scale questions. Surveys provided a breadth of information to demonstrate a representative sampling of both students and faculty (Patton, 1990). Faculty survey responses were then used to develop the informal interview questions (Appendix H).

Data Analysis. Data from Likert-scale responses were analyzed for descriptive statistics to report to the Administration and demonstrate an interest in moving forward in the process. Open-ended survey responses were organized and coded for subthemes and descriptions were written for these themes (Creswell, 2003). The axial coding was used

to develop a Codebook (Appendix I) with emergent themes from the data (Glaser & Strauss, 1967).

Results: Themes

One hundred sixty-one students responded to the student survey. Fifteen faculty responded to the faculty survey; four of those agreed to participate in informal interviews to further inform the findings. Results showed that 65% of students and 53.3% of faculty would be strongly or somewhat in favor of using a kinesthetic classroom during class time. Fourteen subthemes emerged from the qualitative data: assessment, administration, attitudes, functionality, physical limitations, acclimation, pedagogy, learning, alert, focus, distraction, engagement, health, and learning style. As these subthemes were strategically prioritized and connections made between them, six main themes emerged showing a pattern for implementation, the 6-P's: Probe, Plot, Plan, Prepare, Practice, Prove. The Probe theme is defined by assessment. The Plot theme specifies the need to address concerns associated with subthemes of administration and local attitudes. Within the Plan theme, one considers issues of functionality and physical limitations within the space. During the Prepare theme matters related to acclimation, pedagogy, and learning are outlined. In the Practice theme approaches are explored to tackled student alertness, focus, and distraction. The final theme, Prove, measurements of engagement, health, and learning styles are evaluated. Explanations and representative quotes for each of the 14 subthemes are presented briefly here and more in-depth in the Codebook (Appendix I).

Assessment

Assessment pertains to the readiness of a department to adopt an active or kinesthetic learning environment. Aim 1 revealed the need to evaluate faculty and students for perceptions of novel learning environments as a precursor to implementation. Expert statements support this: "It is vital to have the support and enthusiasm of the faculty…in order to make this learning space viable. Overall, there has to be a clearly communicated intention behind a change like this. The purpose of this type of space must be known and supported by several faculty before moving forward in a project of this nature" (Field Notes, 2018). Site visits showed faculty buy-in as essential to the success of implementing a novel learning space.

Administration

The subtheme of administration is concerns associated with decision-making personnel of an institution; including things such as cost and maintenance. This ~~theme~~ topic emerged from all participant groups, and was emphasized by the experts. "Administration was concerned about reducing seating capacity. The room went from 40 seats to 32 work stations. The stations take up space and thus fewer people can be assigned in that classroom" (Expert Interview, 2018). "I would imagine you'd meet resistance to these ideas not because of benefits, but because of lack of funding" (Faculty Survey, 2018). This subtheme demonstrates the need to address cost and maintenance of equipment used in kinesthetic classrooms.

Attitude

Attitude depicts a personal comfort level, or perception of learning when innovative strategies are employed. “It helps that it is coming from Health and PE. But the understanding and readiness have to be in place” (Expert Interview, 2018). “This is outside of most folks’ comfort zone, including mine. One might think that some thorough research about the benefits would convince folks, but I think most faculty members would rationalize why it is not important for them anyway” (Faculty Interview, 2019). While students appeared to be open to the idea, they wanted choice and flexibility on what type of active workstation to use on a given day. Many stated that attitudes may be shifted by increased exposure and demonstrating possible approaches within the new classroom space.

Functionality

Functionality refers to the level of use of the innovative space and equipment. Experts cautioned against simply having equipment available: “I would be concerned that this nice, new equipment would be under-utilized. Also, the way peer pressure works, I would be afraid all students would likely chose the same type of desks. I wouldn’t break the equipment into separate classrooms” (Expert Interview, 2018). “Faculty were assigned to the room based on [functionality] enrollments and didn’t want the room; those who did want it could not request it…. Overall, faculty have to want to be in the space.” (Expert Interview, 2018). These statements reveal the limitations that may emerge when trying to implement a novel learning space. When the purpose is

understood, that a kinesthetic or active classroom impacts the way teaching and learning is exchanged, the use of the space is maximized.

Physical Limitations

Issues related physical disabilities, impairments, or injuries that keep students from using the kinesthetic classroom are referred to as physical limitations. “Like a traditional classroom, it doesn’t fit everyone. We do let students who are injured or physically disabled sit the whole time. We have had to accommodate this” (Expert Interview, 2018). “Limitations would be for those who cannot participate in these kinds of desks due to disability or other cases” (Student Survey, 2018). This subtheme demonstrates the need to bring in others from the campus community as their insights during planning will help the implementation process.

Acclimation

Acclimation is defined as a time period of adapting to the use of equipment in an active or kinesthetic classroom while completing academic tasks. All groups recognized the need for acclimation to this new style of teaching and learning; most felt students could easily adapt. “I think about two weeks before the semester we need to have faculty-time with trainers to see how the space can best meet their needs. Through my own experience I have learned that it just takes time to figure out how to best utilize the space with students in mind” (Expert Interview, 2018). “Students are very resilient and, as such, I do not feel there would be a significant acclimation period” (Faculty Interview, 2019). “It looks like too much at one time. I think, at first the adjustment would be difficult and that eventually I could pair the movement with learning” (Student Survey, 2018).

Pedagogy

Pedagogy refers to a style or approach to teaching that is used to accomplish learning objectives; what a teacher promotes, supports, communicates for learning; exposure to certain tasks that is relevant for certain majors. Innovative classroom can be used to assist the learning process. “This isn’t something to do without faculty buy-in and training! If faculty don’t encourage it, model it, or know how to use it, it won’t happen. Have all of this in place and the equipment before bringing students into it” (Expert Interview, 2018). “Seeing the increased use of kinesthetic classrooms in PreK-12, I felt like our HPETE students needed to be exposed to this style of learning. I saw it as a way to more effectively prepare teacher education candidates for our local public schools and we could be a part of advocating for this possibility.” (Expert Interview, 2018) “I think it's a great idea, and [our university] should incorporate it into some of their buildings.” (Student Survey, 2018) “Kinesthetic learning must be incorporated intentionally. In my opinion, a kinesthetic classroom is not one that simply replaces sedentary desks with kinesthetic desks. It is finding ways to incorporate physical activity into the learning environment…while still accomplishing learning outcomes” (Faculty Interview, 2019).

Learning

The learning subtheme is described as work on tasks, activities, or thinking aimed at improving student understanding of course material; contributes to academic performance. This subtheme aims to support the purpose of the space. “The environment has to reflect learning” (Expert Interview, 2018). “Students have stated that the active learning classrooms provide a ‘more professional space and interactions with the faculty

during learning'" (Expert Interview, 2018). "I feel that a kinesthetic classroom would provide students with the ability to focus on the material that is being taught better. If the body is moving and active, I think it may help to exercise the brain and the body at the same time, allowing more retention of the learning material…." (Faculty Survey, 2018) All groups stated meaningful implications relevant to student-centered learning.

Alert

A range of readiness and attention given to learning depicts the alert subtheme. Students and faculty recognized that a kinesthetic classroom would contribute to students being alert. "Attentive/engaged students is one of, if not the, most important ingredient for classroom teacher. It improves the quality of everything that is done in the class, as well as retention of information, understanding, skills, meaning, and more" (Faculty Survey, 2018). "My course is at 8am…. Therefore, they are usually half awake at best in class. Trying to get the students to engage in class discussion or even respond to my questions is often difficult" (Faculty Survey, 2018). Additionally, an expert emphasized how the environment affects some students. "They [students] can't be anonymous in the class. It's hard for them not to be involved. If they sleep, I can see them. If they are not participating in a group, it's obvious" (Expert Interview, 2018).

Distraction

Distraction is external stimuli, such as noise, sweat, crowding, movement, climate, or becoming tired, that disrupts student learning in a classroom setting. The subtheme of distraction is the most frequent concern from both faculty and students: "[It] may be distracting; students may not want to get sweaty, some students may not want to

use due to clothing (wearing a dress, skirt, suit, high heels, etc.)" (Faculty Survey 2018). "I believe I would be more distracted by what I would be sitting on rather than paying attention in classes" (Student Survey, 2018). The experts felt these limitations were easily dealt with: "It gets crowded and warm, thus less movement happens. The door has to be left open" (Expert Interview, 2018). Experts responses offered varied approaches to dealing with distraction, similar to most classroom management techniques.

Focus

A student's self-regulated ability to pay attention or concentrate on specific tasks needed for learning pertains to focus. Students and faculty perceive that a kinesthetic classroom could help students become more focused in learning. "Benefits include reduced sitting time and perhaps more focus on classroom activities" (Faculty Survey, 2018). "That would be freaking awesome to have that! I feel like this option would have me motivated and focused, and would increase my blood flow" (Student Survey, 2018). This subtheme was noted as both a benefit and limitation in participant responses.

Engagement

Engagement is the level of student participation that is aimed at being a part of learning and understanding course material; a level in which student choice and preference play a role. Statements from all groups of participants demonstrate how the space may impact engagement levels. "For the students, I think they feel more engaged. It's not traditional. It's flexible and it seems to add value to the learning. Students are more likely to participate" (Expert Interview, 2018). "I think it could be helpful in making the classroom more productive and involved" (Faculty Survey, 2018). "I think I

would pay attention better, as the brain thinks better when the body is active. I also think that I would be more positive towards the class" (Student Survey, 2018). All groups identified a potential outcome of increased engagement levels and the impact on learning.

Health

The health subtheme is described as a level of body activity focused on improving health or fitness; not being stationery or sedentary. Students acknowledge movement as linked to health and learning, but many students saw the kinesthetic classroom as simply a substitute for exercise. Similarly, many faculty only mentioned benefits of a kinesthetic classroom associated with health and physical activity. "Being physically active instead of sedentary would be hugely beneficial! It's always struck me as a little ironic/unfortunate that I teach exercise science and my students are sedentary for much of the time" (Faculty Survey, 2018). "I think that it would allow students to be more active instead of having to sit all day" (Student Survey, 2018). "There are numerous amounts of benefits that come along with an active workstation…it can strengthen muscles, burn fat and even relieve stress while we are in class" (Student Survey, 2018).

Learning Style

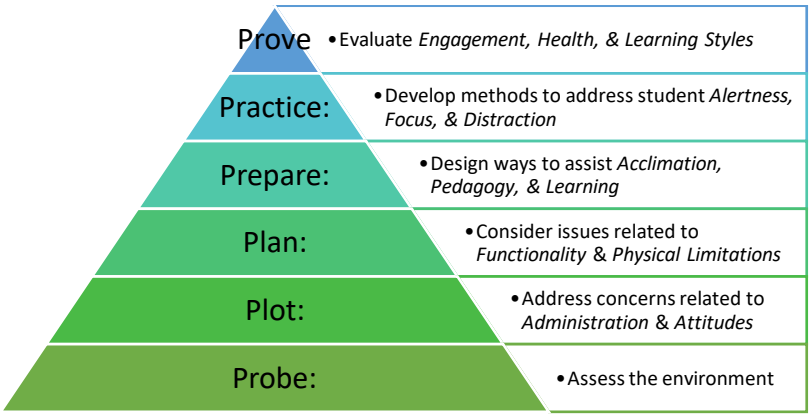
A student's preferred way or method of understanding the course information; when a student prefers movement options while learning. This subtheme emerged as a variant from the learning subtheme, as participant responses linked movement to learning and went beyond what had described in learning. "It's about learning styles. Some students begin to understand why they weren't getting all the information before. It's also about practicing what we preach. Research shows movement helps with learning, thus we

are demonstrating that in this space" (Expert Interview, 2018). "There are so many benefits especially for people who are not auditory or visual learners in which lecture is torture" (Student Survey, 2018). "My opinion of a kinesthetic classroom is that it serves to fulfill the different needs of students. This would have positive effects on my learning because during moments where I may feel tired, I can start moving around freely" (Student Survey, 2018). "I believe letting them move their bodies in a kinesthetic classroom will help them focus and also be more willing to try new things..." (Faculty Survey, 2018).

Discussion

The 14 subthemes from the data were prioritized as needs to establish main themes that revealed a process for implementing an active or kinesthetic learning environment for a university (see Fig. 1). The framework is The 6-P's: A Framework for Implementation of a Kinesthetic Classroom. Each P represents a theme within the framework that addresses issues (subthemes) in a strategic order of need.

Figure 1. The 6-P's: A Framework for Implementation of a Kinesthetic Classroom



Theme one – Probe: It is vital to assess the environment [school or department] for readiness to use a novel learning space. Theme two – Plot: During this theme concerns relevant for administration must be addressed; this includes providing information on costs and funding sources for the active workstations, as well as ways to deal with maintenance. Also in this theme, action is taken to inform and rally support from members of the community. Attitudes towards using the kinesthetic/active learning space must be understood, as faculty buy-in is essential to the success of the approach. Care should be taken to share the reason and purposes for using this approach in a university setting. Theme three – Plan: This theme involves getting other key decision-makers (i.e. Registrar's Office and Deans) on board to propose locations and layout for increased functionality and ways to minimize physical limitations to comply with the Americans with Disabilities Act. Integrating universal design elements at this time will save monies and address issues of concern (The Center for Universal Design in Education, 2019). This may be done by: a) involving wheelchair users in the planning process; b) having students select workstations they feel will work well for them to collaborate and be comfortable; c) or having easy access to at least one desk that can be raised/lowered depending on the needs of the students. Once other members of the campus community are on board, it is possible to move forward in the process. Theme four – Prepare: During this theme the focus is on the faculty and equipping them to effectively use the space. Ideas must be developed and shared to assist faculty with pedagogy and learning techniques. Faculty may need ways to account for distractions from learning, and envision effective pedagogical tools for the novel learning space. Training during this

theme will allow faculty to better prepare for acclimation and issues of classroom management. Theme five – Practice: The kinesthetic classroom is implemented during this theme, and faculty must try methods to effectively engage and assist students in areas of alertness, focus, and distraction. Theme six – Prove: The aim is to provide evidence as to the value of a kinesthetic classroom; it is in this theme when the impact of the novel learning environment on learning can be measured. Faculty are able to evaluate the effects on student engagement, learning styles, and health. The framework of The 6-P's is a tool that demonstrates how to navigate the strategic process for implementing an effective kinesthetic classroom environment for a university setting.

Conclusion

The primary focus in higher education is on student learning. Instructors are looking for approaches that will enhance the teaching and learning exchange/process. It is imperative that colleges and universities be informed about the impact the classroom environment has on both student learning (Jamieson, 2003) and engagement (Axelson & Flick, 2010). Active learning models have successfully demonstrated that student-centered pedagogies have a positive influence on learning and motivation (Adedokun et al., 2017). Active workstation options for use during class time is preferred by many students and may promote engagement (Benzo et al, 2017). My research provided evidence of the strategic process needed to create a kinesthetic classroom for a university campus. It also revealed a significant obstacle of how to obtain the active workstations. As a result of this project a grant proposal was submitted to the Board of Visitors at My University (Appendix J) to fund the equipment for a kinesthetic classroom, which will

then be used to further evaluate the effects of the space in college student learning. It is expected that this study will serve as an impetus for active and kinesthetic learning changes novel to higher education.

CHAPTER II

DISSEMINATION

The first step towards dissemination of this project was to apply for funding through an internal grant from the Board of Visitors (BOV) at My University. The BOV provides annual grants which allow students and faculty to participate in activities that are not covered in the University's budget. Each year the Board aims to fund projects that focus on the student experience. The grant proposal was limited to five basic questions regarding impact, budget and timeline, and a narrative description of 500 words or less that included the purpose, how it would enhance the student experience, and the overall impact. The proposal (Appendix I) was submitted to the BOV for review on January 25, 2019. If awarded this grant, it would provide one-time funds up to $50,000 to acquire active workstations for a kinesthetic classroom in the School of Sport Sciences.

The next step in dissemination was to seek pathways to incorporate active and kinesthetic learning environments into some of the classes offered in my department. This was done by advocating with administration utilizing a One-page Fact Sheet (Appendix K) to summarize results and demonstrate the process to move forward. The process aligns with my research findings, as I utilize the 6-P's framework described in Chapter I to navigate the systems within My University. Since applying for the BOV grant, I have also updated the grant proposal for future funding opportunities. Chapter II provides the details of the updated grant proposal template.

Grant Proposal: Kinesthetic Classroom

Background

Many faculty are concerned with ways to enhance student learning and engagement in the classroom. We know students do not all learn and apply information in the same ways; some are strong auditory learners; others are strong visual learners; and some students learn best through movement. Research already supports that standing, movement, and exercise influence learning, improve brain function, and expand the processing of information (Mehta, Shortz, & Benden, 2015). Thus, a classroom that allows students the flexibility to choose from a variety of postures during class time is one way to enhance the student learning experience. An "active permissive environment" (Lanningham-Foster, et al., 2008, p. 1849) is a simple approach that allows students to decide if they learn best in a seated or active posture (i.e. standing, moving, or balancing). Based on active learning theory, pedagogy that involves students in the learning process and encourages participation is more effective than passive listening (Bonwell & Eison, 1991). *Kinesthetic classrooms* expand this theory and complement active pedagogy by incorporating actual movement during class time. Movement prepares the brain for learning and aids students to connect and process information more efficiently (Blaydes, 2000). During learning the brain takes in information and links it through both implicit and explicit learning. Typical school work focuses on explicit learning, skills that involve rote memorization; however, implicit learning happens intuitively as the brain is making connections between the information, context, and environment (Frensch & Rünger, 2003). Implicit learning relies on a level of attention given during lessons (Seger, 1994),

and is driven by body movement. Some of our students will learn best in this manner and numerous others may benefit from active postures. Kinesthetic classrooms can facilitate this type of learning.

Kinesthetic classrooms include various forms of flexible, moving workstations, such as standing desks, cycling desks, glider desks, and specialized seating to promote balance and core muscle strength. Many of these have been implemented successfully in K-12 school classrooms. I believe we can effectively facilitate kinesthetic learning for university students as well. It is imperative that as a university we inform ourselves about the impact the classroom environment on both student learning (Jamieson, 2003), engagement (Axelson & Flick, 2010) and ultimately the student experience at our university. Active learning models have successfully demonstrated that student-centered pedagogies have a positive influence on learning and motivation (Adedokun et al., 2017). Further research posits that active workstation use during class time would be welcomed by a majority of students (Benzo et. al, 2017). I assert the next logical step is to create a kinesthetic classroom at My University to enhance the student learning experience.

Because curriculum within Sports Sciences is geared toward increasing physical activity both in knowledge and practice, this provides a logical place to implement and maintain a kinesthetic classroom. I do not see this learning space as limited to Sport Sciences use; rather, I can envision this innovative space being open to faculty across campus and disciplines. It will allow the faculty an innovative space to expose students and expand our knowledge of student-centered learning and the classroom-experience.

Impact

Creating a kinesthetic classroom will impact the campus community in several ways. Short-term, it will provide a space that can be used by programs such as Health and Teacher Education. Due to the increase of kinesthetic classrooms for K-12, future teachers' need to be exposed to this style of learning for professional practice. Additionally, students within Personal Health and Wellness courses can discover how innovative work environments may address both learning and sedentary behaviors; it will introduce these students to standing and active workstations similar to those showing up in many office settings to promote healthy lifestyles. Since all undergraduate students regardless of major, must take Physical Education (PE) 101, Personal Health and Wellness, over 500 students each semester will be exposed to the kinesthetic classroom. Long-term, it is envisioned that the space will be open to and utilized by faculty campus-wide to advance pedagogies, learning, and the student experience.

Preliminary Work

As a doctoral candidate, I have spent the last three years studying effective teaching and learning practices to establish a basis for my own research. As a professor with eight years of teaching experience and assessing student-centered practices, I want my research to contribute to ways in which we can improve college student learning through active learning theory. I have done so by developing a process for strategically implementing a novel learning space for a university campus. Through my research themes surfaced that support a framework entitled "The 6-P's: A Framework for Implementation of a Kinesthetic Classroom". The 6-P's include steps to Probe, Plot, Plan,

Prepare, Practice, and Prove. The Probe theme is defined by assessment. One cannot effectively implement a novel pedagogy without first assessing the environment for readiness. The Plot theme specifies the strategic need to address concerns associated with subthemes of administration and local attitudes. Many of these issues will surface during the assessment, and must be attended to before moving forward. Within the Plan theme, one considers topics of functionality and physical limitations within the space. Key members and decision-makers of the campus community must be included during this part of the process. During the Prepare theme matters related to acclimation, pedagogy, and learning are outlined; faculty training and concerns are addressed. In the Practice theme approaches are explored to deal with student alertness, focus, and distraction. In the final theme, Prove, measurements of engagement, health, and learning styles are evaluated. These themes, when applied allow individuals to navigate the systems within higher education for effective implementation of a novel learning space.

My University is posed through its personnel and resources to support implementation of a kinesthetic classroom for the School of Sport Sciences. The research has been done to effectively navigate the universities processes and provide meaningful impact for students and faculty. The funding of the active workstations is the most significant obstacle, and can be alleviated by the Board of Visitors grant monies.

Detailed Budget and Narrative

The cost of implementing a kinesthetic classroom is approximately $50,000 (see Budget attached). The exact costs can be determined once: 1) a location and dimensions of the space are reported to Kidsfit, and 2) the design and capacity of the classroom space

is chosen. The specially designed kinesthetic classroom desks range in price from $1,095 for a single active desk up to $4,995 for 6-person active desk option. In the classroom that was observed at a regional university [University A], there were a total of 32 workstations and one for the instructor. The company also offers discounts for organizations who send a representative to attend the Action Based Learning trainings. Thus, this request also builds in the cost of training one faculty member. The cost of the training is $695 for a 3-day training; two viable options exist in Wilmington, North Carolina (June 24-26, 2019) or Charleston, South Carolina (July 17-19, 2019). Travel cost are being requested to cover mileage, lodging, and food expenses not covered by the training. All other costs reflect either supplies needed for the planning team or incentives for faculty feedback of the kinesthetic classroom.

Figure 2. Budgetary Summary: Kinesthetic Classroom

Brief Itemization	**Amount**
Kinesthetic Classroom Equipment:	$47,400
Supplies and Materials: Printing or supplies needed for planning team	$33
Contracted Services: On-site Training	$1000
Travel: Training Registration	$695
Travel: Mileage	$150
Travel: Lodging	$432
Travel: Food	$40
Other Expenses: Incentives for faculty/curriculum feedback (Gift cards)	$250.00
Total Requested / Awarded	**$ 50,000**

CHAPTER III

ACTION PLAN

My long term goal is to contribute to ways in which kinesiology-related departments can improve college student-centered learning and engagement practices. As a doctoral candidate with over eight years of teaching experience and assessing student-centered practices, I want to promote transitions in pedagogical approaches and practice that increase learning effectiveness and add value to the student experience. I believe one way is by creating a kinesthetic learning environment. Through this study I was able to determine the steps of implementing a kinesthetic classroom at my university and thereby creating a framework for the process to be used by others. While the grant proposal outlined in Chapter II is a step towards implementation, more work will need to be done to gather support and move forward.

This action plan includes several short-term goals that will allow me to advocate for kinesthetic changes novel to higher education learning. The findings of this dissertation will be shared with the Dean of the School of Sport Sciences. A one-page fact sheet summarizing perceptions of the kinesthetic classroom, and the 6-P's will be given to the Dean, as well as recommendations for moving forward in the process. With approval from the Dean of Sport Sciences, a presentation on the process and value of implementing kinesthetic classrooms for college learning will be developed to share with the my university campus community. A good avenue for this is the Colloquium series.

This series provides an opportunity for faculty and staff at My university to dialogue about pedagogical concerns and provide strategies for effective teaching, and is offered twice a semester. The Lyceum series may provide a good environment to share the presentation and findings with students. Students must attend 40 different Lyceums to meet graduation requirements, and topics range on scholarly topics to personal and professional growth issues. Both of these avenues will allow me to talk with others in the community and find collaborators for the planning process.

The findings of my dissertation helped develop a framework for implementing a kinesthetic classroom for a university campus. This was done to be shared with other educators looking to develop a kinesthetic classroom for their institution. I will submit a presentation proposal to the North Carolina AAHPERD-SM (state chapter of SHAPE) conference scheduled for October 2019. My presentation will aim to share the details of this study, including the framework for implementation and best practices in kinesthetic learning environments. Another option is to submit a presentation proposal for the 2019 Lilly Conference – Ashville (August 5-7). The focus for this conference is Innovative Strategies to Advance Student Learning. I believe my topic will be a good fit for this conference. The presentation will emphasize the framework for implementation and best practices for transitions in university learning environments. During the dissertation process I worked with several members of the UNCG Innovative Learning Spaces Council; this group was supportive and interested in my study. It was recommended that I submit an article to the *Journal of Learning Spaces* to share my findings, as one of the members of the council is a reviewer for this journal.

Based on the framework for implementation from this study, I project my own process to be in the Plot stage. Through local dissemination of the study findings, I hope to build a committee of faculty that will assist me in moving into the Planning theme of this process. A long-term goal includes seeking additional grant funding to acquire active workstations for the kinesthetic classrooms and other learning spaces on campus. Several active workstation companies offer yearly grants opportunities, these include: Action Based Learning; Steelcase©; and HON. Other colleagues have already asked me to visit their institutions to share my research with students, or advise the department on the process of implementing a kinesthetic classroom for their institution. I have also been advised to share the idea with Steelcase (Raleigh, NC) to market standing and moving desks specific for higher education.

Further Studies

Active workstations and kinesthetic classrooms could be a viable option in the university setting if research can extend findings to the college population. Introducing active workstations in college classrooms can prepare students for developing lifestyle habits that might be useful in professional, sedentary settings. Overall, I will continue to advocate for kinesthetic changes and assist others in the field as they transition their learning environments to reflect active learning pedagogies. It is my hope that this study could serve as an impetus for best practices in kinesthetic learning changes to the traditional classroom. Future studies can provide evidence for not only active and kinesthetic learning environments, but also implicate pedagogies to promote increased learning for future generations of students.

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APPENDIX A

SITE VISIT: INFORMAL INTERVIEW QUESTIONS

1. What was the motivation behind getting a kinesthetic/active classroom?

2. What kept you moving forward in the process?

3. What was your biggest obstacle?

4. What do you wish you had known before teaching in the space?

5. What do you see as the biggest benefit to this learning space?

6. What do you see as the biggest weakness to this learning space?

7. What concerns have been raised about the space? Can you give an example and explain how you dealt with it.

8. What do you wish you had known before starting the process?

APPENDIX B

SITE VISIT: PROTOCOL QUESTIONS

1. In general, describe the setting and activities completed during the site visit.

2. What was the primary purpose of this space? How exactly do they do this?

3. What types of workstations are available in the space?

4. What activities and movements are allowed in this space?

5. What are students doing in this space?

6. What structure or pedagogy is used to facilitate learning in this space?

7. How do students chose where to work in this space?

8. What other features influence this space? What assumptions are made?

9. Explain your overall thoughts, next steps, or questions that were raised that are unanswered as a result of this site visit.

APPENDIX C

SITE VISIT NARRATIVE

University A – 9/10/18

On Friday, August 31, 2018 I visited University A, the first University to implement a kinesthetic classroom. The purpose of this visit was to experience and gather information on the use and design of the kinesthetic classroom in a higher education setting. It was one thing to read studies about movement influence on learning; this visit provided an opportunity to observe movement and learning in action. What I found was that students and faculty are excited by what it happening in this novel learning environment.

I learned several things as a result of this visit. From an administration perspective, "The investment is totally worth it" (Expert Interview, 2018). The Dean overseeing this project really saw this as an opportunity for both students and faculty. This type of lab environment exposed teacher education students to a different type of classroom spaces they may be asked to use. Additionally, it provides a space for faculty to measure the impact of movement on learning and pedagogy. It caused a shift from simply what is known about movement and learning into an application phase. From the faculty perspective the kinesthetic classroom can be used as a complement to one's teaching style. The lab creates an environment that is aimed to empower students to learn. The faculty members have found the use of the space as a way to address a gap in learning, the kinesthetic side.

As an observer in the novel learning space I found several notable elements. There was a time of acclimation needed for the different workstations. Each desk required a moment to get balanced or adjusted before moving or learning activities began. I also saw the need to have student switch locations during class time; for the class I observed this happened three times, in 20 minute segments. For the first few minutes at the new location, almost all students were moving. Then movement became more intermittent. Throughout the observation it became apparent that some workstations were more popular and others were underutilized. This could be key information to use if designing a new space within a university setting.

This space seems to work, however both faculty and students shared things they have learned along the way about using the space. The space is so new that many things are learned through trial and error. This is a new idea and approach to university classrooms. It is not a one-size fits all space. Some people will not like it. Faculty have to buy-in and know how to use this space. A possible reason why this space works in a HPE program is because the focus of the curriculum is on principles surrounding movement and instruction.

It is vital to have the support and enthusiasm of the faculty from this [HPE] and other related programs in order to make this learning space viable. Overall, there has to be a clearly communicated intention behind a change like this. The purpose of this type of space must be known and supported by several faculty before moving forward in a project of this nature. What still needs to be answered is clear: Where do faculty at my stand on this? Will they be open to kinesthetic classroom lab space like this? Will the transition have to come in various steps of implementation?

APPENDIX D

SITE VISIT NARRATIVE

University B – 9/26/18

On Wednesday, September 19, 2018 I visited with staff from University B. The purpose of this visit was to experience and gather information on the use and design of active classroom spaces in a higher education setting. It was an opportunity to see and experience redesigned learning spaces that aimed to increase student interactions and engagement during class time. The center provides interdisciplinary learning spaces with the high levels of technology to assist the learning process.

I learned several things as a result of this visit. Students like the "more professional space to work and interact with faculty" (Expert Interview, 2018). The idea is to put the students in the driver's seat through active learning pedagogies. It is clear that this approach works for some, but is not a one size-fits all format. Numerous opportunities for research and learning for both students and faculty are evident within the center. The dynamic work spaces expose students and faculty to additional technological resources, from virtual reality labs, to interactive screen spaces in study areas; these technologies represent those that may be available in future career settings. It is valuable exposure to prepare students for several specified workforces. The technology seems to be used as the main conduit for active learning, neglecting lower cost solutions to engage learning.

As I toured that facility and got to experience demonstrations in a classroom, I found that the technology in place would require training in order to incorporate into lesson plans. I also noticed the visual stimulation of the space; it was new and modern design with several glass walls in each space. I can see this causing possible visual distractions. It also allows for an openness to the learning environment; nothing is completely hidden or private. Classrooms are visible to many bystanders. As stated by my hosts, the active learning classrooms require a bit a acclimation time for both the instructor and students.

For all of the innovations in these learning spaces, there seemed a lack of options for various types of workstations. Students could usually only sit to work or collaborate. Only two meeting rooms had standing height tables. In those rooms all participants were sitting in bar height stools. I believe this simple element was overlooked in the design of these spaces. Comfortable, modern seating and aesthetics seemingly took precedence. In a student survey conducted in spring 2018, the majority of students were satisfied with the comfort of the seating, but as noted by my host, this was still a lesser rating than other feedback categories (Presentation, 2018).

This space seems to address elements of active learning pedagogy. My hosts readily shared lessons they have learned during the first year operating the spaces. The innovative classroom space is dependent on an instructor's willingness to create activities and space for students to become a part of the exchange of learning. The good faculty get students engaged *and moving* around the room; they are having students utilize both the space and the technology. Instructors have to do things by trial and error, with the focus of designing active learning opportunities with students as central to the design.

Since this project was exclusively funded by donors and strategic partners, the furniture was donated to the campus without much insight from faculty or students. Some faculty are making it work and others are resisting the change. While this is a viable change to high education learning environments, I wonder why standing desks and other workstations we not part of the design to assist with the mind-body connections in learning. My hosts' were supportive of this idea and commented that this type of change would fit for the next phase and re-evaluation of the learning spaces. In this innovative center it would be a good fit for various types of workstations. It would be interesting to receive feedback from faculty and students on standing and active workstations in this space.

APPENDIX E

SITE VISIT NARATIVE

University C – 10/17/18

On Thursday, September 27, 2018 I visited one active classroom at the University C. The purpose of this visit was to observe and gather information on the use and design of an active classroom space in a higher education setting. It was an opportunity to see and experience a redesigned learning space that aimed to increase student interactions and engagement during class time. Following the class, I spoke with the faculty member, on her perceptions of the classroom and how she uses it in her teaching strategy. The classroom was situated in the sociology department, but has various disciplines that utilize the space. I later followed-up with an informal interview with a member of the University Teaching and Learning Commons (UTLC) to discuss the active learning space and its design more in depth.

I learned several things as a result of this visit and the conversations that followed. Faculty either love or hate the active learning classroom. Instructors' find that students participate more due to ease of moving around the room. "I can do whatever I want. I am not limited by the space. It is much easier to facilitate group discussion and work with large groups or create an intimate working space for 15-20 students. This adds value to my teaching style" (Expert interview, 2018). The purpose and design of the space has been reflected in the complaints and feedback from other faculty. "Students seem to talk and move around more, which can be distracting for instructors who are not using active learning pedagogy" (Expert interview, 2018). Most of the student feedback has come through faculty members. Students seem to like the active classroom space if the instructor uses it creatively. There has been positive feedback on active learning strategies used in the space.

Active learning classrooms require acclimation time for both the instructor and students. A faculty member referenced the need to orientate students to the room at the beginning of the semester. She liked the suggestion of having UTLC conduct a brief demonstration the first week of class. This would help students understand the why behind the space and how to set up the classroom before class begins. As I observed the use of the space during class time, several things were evident. Students easily formed groups in which to work and interacted well, but it was also possible for them to remain anonymous or avoid some interactions. It seemed there was greater amounts of conversation going on during the group work time. Televisions and whiteboards were placed on each wall, but they were not used during my observation. It seems the technology involved in this space would require additional training before faculty could comfortable use it.

UTLC has recognized the need for this type of flexible learning space both to encourage innovative pedagogy, and to train faculty members who prefer to incorporate more active learning techniques. The nursing program has requested active learning classrooms in their new building; the faculty in nursing are looking for training opportunities during the construction phase of their building. This classroom has been a target for providing this type of workshop. It is clear active learning classrooms are needed, but it cannot be the only type of learning spaces at University C (Expert Interview, 2018).

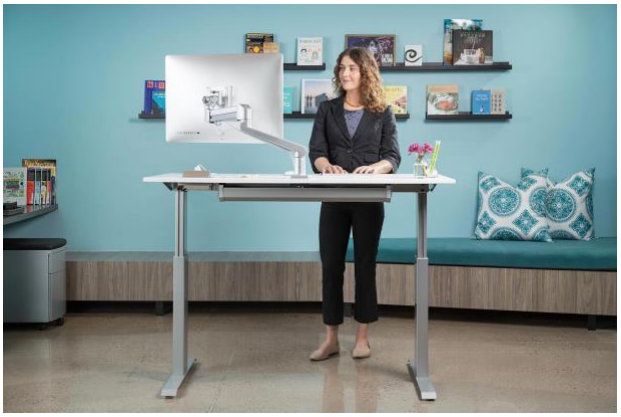
While the classroom represents a step towards active learning, students are still seated to work or collaborate. Standing desk options are something to consider for future phases of this project. The only standing desk was placed at the front of the room for instructor use. I wonder if a variance of workstations could help maximize the number of seats required for a certain administrative office, and help with the disorder that has caused many faculty members to complain about the space; for example, stand-to-sit tables around the perimeter of the room, with node chairs flexibly place in the center of the space. I believe transitional desks that can stand or sit are a simple element that is often overlooked in the initial design of these types of learning spaces.

This space is designed to encompass key elements of active learning pedagogy. Both the faculty member and administrator readily shared lessons they have learned during the first year using the space. Innovative classroom space is dependent on an instructor's willingness to create activities that allow for movement and collaboration within the space. Focusing on student centered practices, instructors and UTLC have done things by trial and error; some have worked others have not. UTLC has offered several workshops and trainings in the actual classroom space, but the response has been underwhelming. They are looking for new ways to promote the use of the space, engage faculty, and design systems for scheduling people in the active classroom that want to be there. Once faculty see the possibilities of the space they will hopefully develop a comfort level for teaching in the space and imagine greater possibilities.

APPENDIX F

SURVEY QUESTIONS - FACULTY

Demographics:
Gender: M, F, Other
Years of teaching experience:
(0-5, 6-10, 11-15, 15+)




1Kennyrhoads [username]. (2017). *Sit-stand adjustable desk flex-table*. Retrieved from https://commons.wikimedia.org/wiki/File:Sit-Stand-Adjustable-Desk-FlexTable.jpg
2Posturite. *Varidesk pro plus 36 dual monitor desk*. (n.d.). Retrieved from https://www.posturite.co.uk/varidesk-pro-plus-36.html

The following questions will reference the above image:

1. Have you ever used a standing desk (as pictured above)?
   (Yes/No)
   If yes, what tasks did you complete while using a standing desk?
   (open-ended)
2. Have you ever taught a class in which standing desks were available?
   (Yes/No)
3. Would you be in favor of having standing desks available in classes you teach?
   (Yes/No)
4. What class room size do you think standing desks would be well suited for?
   (Small Class 1-15, Medium Class 16-30, Large Class 30-50, Very Large class 50-100)
5. Where would you prefer standing desks be located?
   (Back row, Middle rows, Front row, End of rows, Every row)

Please rate how strongly you agree or disagree with each of the following statements:

6. I am in favor of having **standing desk** options available in classrooms at my university.
   (scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

7. S**tanding desks used during class time** would provide students with increased **health benefits**.
   (scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

8. S**tanding desks during class time** would provide students with increased **academic performance**.
   (scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

**Images taken at Kennesaw State University, August 31, 2018.*

The above images feature a kinesthetic classroom. The desks use active equipment paired with a desk top to allow for basic movement while working. The following questions will reference the above images:

9. Have you ever taught or taken an academic class in a classroom that uses active desk options, such as standing desks, balance stools, yoga balls, glider desks, bike desks, step desks (as pictured above)? (yes/no)

   If yes, list the various types of active desk options you used.
   (radio buttons with a "other" category)

10. Would you be in favor of teaching in a kinesthetic classroom?
    (Yes/No)

11. What are potential benefits or limitations that may result from your students using a standing desk or a kinesthetic classroom during class time? (open-ended)

Please rate how strongly you agree or disagree with each of the following statements:

12. I would like to teach a class in a **kinesthetic classroom**, like the one pictured above.
    (scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

13. If I had access to a **kinesthetic classroom I would choose this classroom** often for the courses I teach.
    (scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

14. K**inesthetic classroom use during class time** would provide students with increased **health benefits**.
    (scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

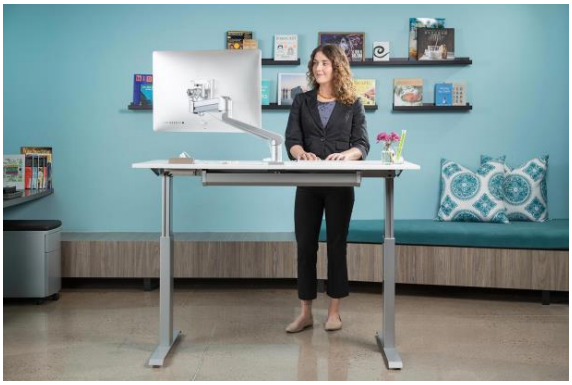
15. K**inesthetic classroom use during class time** would provide students with increased **academic performance**.
    (scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

16. Please share any additional comments?
    (open-ended)

APPENDIX G

SURVEY QUESTIONS - STUDENTS

Demographics:
Gender: M, F, Other
Year in school:
Fr, So, Jr, Sr, Other



Kennyrhoads [username]. (2017). *Sit-stand adjustable desk flex-table*. Retrieved from https://commons.wikimedia.org/wiki/File:Sit-Stand-Adjustable-Desk-FlexTable.jpg

The following questions will reference the above image:

1. Have you ever used a standing desk (as pictured above)?
   (Yes/No)
   If yes, what tasks did you complete while using a standing desk?
   (open-ended)
2. Have you ever taken a class in which standing desk options were available?
   (Yes/No)
3. On average what percent of class time do you currently spend standing?
   (percentage or words?) (0%, 1-25%, 26-50%, 51-75%, 76-100%)
4. If given the option by your instructor would you prefer to sit or stand during class time?
   (Sit the entire class time, Sit part of the time and stand part of the time, Stand entire class time)
5. If standing desks were made available during class time, I would chose this option:
   (All of the time, Some of the time, None of the time)
6. Explain why you **would** or **would not** prefer to use a standing desk over a traditional desk during class time. (open-ended)

7. In what situations would you choose a standing desk over a traditional seated desk use? (open-ended)

Please rate how strongly you agree or disagree with each of the following statements:

8. I am in favor of having **standing desk** options available in classrooms at my university.
   (scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

9. If **standing desks were available during class time** I would choose this option often.
   (scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

**Images taken at Kennesaw State University, August 31, 2018.*

The above images feature a kinesthetic classroom. The desks use active equipment paired with a desktop to allow for basic movement while working. The following questions will reference the above images:

10. Have you ever taken an academic class in a classroom that uses active desk options, such balance stools, yoga balls, glider desks, bike desks, step desks (as pictured above)? (yes/no)

    If yes, list the various types of active desk options you used.
    (radio buttons, including "other" category)

11. What is your opinion of a kinesthetic classroom, like the one pictured above? What effects do you think taking classes in a kinesthetic classroom would have on

your learning? What tasks would you do well? What tasks would you struggle to do?
(open-ended)

12. What are potential benefits or limitations that may result of using an active workstations during class time?(open-ended)

Please rate how strongly you agree or disagree with each of the following statements:

13. I would like to take a class in a **kinesthetic classroom**, like the one pictured above. (scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

14. If taking a class in a kinesthetic classroom I would choose the **active desk options often.**
(scale: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

15. Do you have any additional comments?
(open-ended)

APPENDIX H

FACULTY FOLLOW-UP: INTERVIEW QUESTIONS

Several benefit and limitation subthemes developed in survey responses regarding kinesthetic classrooms. I would like to gain more in depth information from faculty. Would you be willing to answer a few open-ended questions?

1. Many faculty said a potential benefit to using a kinesthetic classroom was students will be more focused/alert/engaged. Why do you think this is important for the classes you teach? What could you accomplish that you couldn't do before? Please give a specific example.
2. Many faculty said a potential benefit to using a kinesthetic classroom was students will gain movement and increased physical activity. Why is this important in the classes you teach?
3. The number one limitation faculty gave to using a kinesthetic classroom was that students might be distracted or decrease concentration. What are some ways/ideas/suggestions you have on how you would work to overcome this in your classes?
4. Some faculty suggested it may be difficult to accomplish class time activities or discussions in a kinesthetic classroom. What would be your suggestions to alleviate this problem?
5. Student acclimation was a noted concern in the survey. How long do would you project your students taking to adjust to this novel learning space [kinesthetic classroom]? What would you do to facilitate this process in your classes?
6. Why do you think some faculty are supportive of this idea? Why do you think some faculty may be resistant to this idea?
   Finally, what are your thoughts about teaching in a kinesthetic classroom?

APPENDIX I

CODEBOOK

Themes:	Subthemes:	Definitions:	Examples from data:
Probe	Assessment	Determine the readiness of a department to adopt an active or kinesthetic learning environment.	It is vital to have the support and enthusiasm of the faculty from this [HPE] and other related programs in order to make this learning space viable. Overall, there has to be a clearly communicated intention behind a change like this. The purpose of this type of space must be known and supported by several faculty before moving forward in a project of this nature. (Field Notes, 2018) Since our project was exclusively funded by donors and strategic partners, the furniture was donated to the campus without much insight from faculty or students. Some faculty are making it work and others are resisting the change. (Field Notes, 2018) Innovative classroom space is dependent on an instructor's willingness to create activities that allow for movement and collaboration within the space. (Field Notes, 2018)
Plot	Administration	Concerns associated with decision-making personnel of an institution; including things such as cost and maintenance.	"Administration was concerned about reducing seating capacity. The room went from 40 seats to 32 work stations. The stations take up space and thus fewer people can be assigned in that classroom." (Expert Interview, 2018) "I would imagine you'd meet resistance to these ideas not because of benefits, but because of lack of funding." (Faculty Survey, 2018) "During the first year students would bring repair requests to me. We didn't really know what to do with those…. As we continue to figure out how to creatively use the space, it may become more expensive." (Expert Interview, 2018)
	Attitude	A personal comfort level or perception of learning when innovative strategies are employed.	"It helps that it is coming from HPE. But the understanding and readiness have to be in place." (Expert Interview, 2018) "This is outside of most folks' comfort zone, including mine. One might think that some thorough research about the

			benefits would convince folks, but I think most faculty members would rationalize why it is not important for them anyway." (Faculty Interview, 2019) "I like the idea but I feel that most would not like it." (Student Survey, 2018) "It's a good idea to have the option but bad idea to make it required." (Student Survey, 2018)
Plan	Functionality	The level of use of an innovative space and equipment.	"I would be concerned that this nice, new equipment would be under-utilized. Also, the way peer pressure/influence works, I would be afraid all students would likely chose the same type of desks. I wouldn't break the equipment into separate classrooms." (Expert Interview, 2018) "It reduces the specialty or novelty if there are a few pieces in too many spots; and you risk under use." (Expert Interview, 2018) "I will just sit." (Student Survey, 2018)
	Physical Limitations	Issues related physical disabilities, impairments, or injuries that keep students from using the features of a kinesthetic classroom.	"Like a traditional classroom, it doesn't fit everyone. We do let students who are injured or ADA sit the whole time. We have had to accommodate this." (Expert Interview, 2018) "limitations would be for those who cannot participate in these kinds of desks due to disability or other cases." (Student Survey, 2018) "Get Disability Services involved when you have student who needs ADA accommodations." (Expert Interview, 2018)
Prepare	Acclimation	A time period of adjusting and adapting to the use of equipment in a kinesthetic classroom while completing academic tasks.	"I think about two weeks before the semester we need to have faculty time with trainers to see how the space can best meet their needs. Through my own experience I have learned that it just takes time to figure out how to best utilize the space with students in mind". (Expert Interview, 2018) "I think it would take some time for students to settle in and not goof around." (Faculty Survey, 2018) "It looks like too much at one time. I think, at first the adjustment would be difficult and that eventually I could pair the movement with learning." (Student Survey, 2018)

	Pedagogy	Refers to a style or approach to teaching that is used to accomplish learning objectives; what a teacher promotes, supports, communicates for learning; exposure to certain tasks/information that is relevant for certain majors.	"I think it's a great idea, and [our university] should incorporate it into some of their buildings. In order for this idea to work, I feel like more students should become aware of this…" (Student Survey, 2018) "this type of classroom environment may not be a good fit for all teachers." (Faculty Survey, 2018) As an educator I already put a great deal of effort into designing engaging classroom activities/discussions and promote the "Why?" and meaningfulness of what we are covering frequently. I am not sure it would help me accomplish much more in particular, but with it could accomplish more overall, and some students could see a significant improvement in performance and/or enjoyment." (Faculty Interview, 2019) "Seeing the increased use of kinesthetic classrooms in PreK-12, I felt like our HPETE students needed to be exposed to this style of learning. I saw it as a way to more effectively prepare teacher education candidates for our local public schools and we could be a part of advocating for this possibility." (Expert Interview, 2018) "This isn't something to do without faculty buy-in and training! If faculty don't encourage it, model it, or know how to use it, it won't happen. Have all of this in place and the equipment before bringing students into it." (Expert Interview, 2018)
	Learning	Work on tasks, activities, or thinking aimed at improving student understanding of course material; contributes to academic performance.	"The environment has to reflect learning." (Expert Interview, 2018) "Many [students] attributed it to the classroom space and how I used the space in learning. Students like the ability to move around and easily work together." (Expert Interview, 2018) "Students have stated that the active learning classrooms provide a 'more professional space and interactions with the faculty during learning'" (Expert Interview, 2018) "Kinesthetics allow the students to connect with the material through additional means…. Instead of simply

			lecturing the students about the dynamics and qualities of each, the students engage in an activity that allows them to see these elements through their own activities and connect the concepts to real world examples." (Faculty Survey, 2018) "I feel that a kinesthetic classroom would provide students with the ability to focus on the material that is being taught better. If the body is moving and active, I think it may help to exercise the brain and the body at the same time, allowing more retention of the learning material. Tasks that might require more critical and logical thinking may be done well due to the utilization of the brain during exercise." (Faculty Survey, 2018)
Practice	Alert	A range of readiness and attention given to learning	"Attentive/engaged students is one of, if not the, most important ingredient for classroom teacher. It improves the quality of everything that is done in the class, as well as retention of information, understanding, skills, meaning, and more." (Faculty Survey, 2018) "I think it could be a great idea. It would keep you moving and active instead of sitting still. I feel as if it would keep our brains working." (Student Survey, 2018) "My class would definitely benefit…My course is at 8am, and this week when talking about sleep…many said they go to bed after 2am. Therefore, they are usually half awake at best in class. Trying to get the students to engage in class discussion or even respond to my questions is often difficult." (Faculty Survey, 2018)
	Distraction	External stimuli, such as noise, sweat, crowding, movement, climate, or becoming tired, that disrupts student learning in a classroom setting.	"It gets crowded and warm, thus less movement happens. The door has to be left open." (Expert Interview, 2018) "[It] may be distracting; students may not want to get sweaty, some students may not want to use due to clothing (wearing a dress, skirt, suit, high heels, etc.)" (Faculty Survey 2018) "I believe I would be more distracted by what I would be sitting on rather than paying attention in classes." (Student Survey, 2018)
	Focus	A student's self-regulated ability to pay attention or	"Benefits include reduced sitting time and perhaps more focus on classroom activities." (Faculty Survey, 2018)

		concentrate on specific tasks needed for learning.	"I thinks it a little bit too much when you're trying to get work done and at the same time you're exercising. But I can also see it as a helping tool to get your mind going." (Student Survey, 2018) "I would probably be more focused on the kinesthetic part of the class and less on the actual work". (Student Survey, 2018) "That would be freaking awesome to have that! I feel like this option would have me motivated and focused, and would increase my blood flow." (Student Survey, 2018)
Prove	Engagement	A level of student participation that is aimed at being a part of learning and understanding course material; a level in which student choice and preference play a role.	"For the students, I think they feel more engaged. It's not traditional. It's flexible and it seems to add value to the learning. Students are more likely to participate." (Expert Interview, 2018) "I think it could be helpful in making the classroom more productive and involved." (Faculty Survey, 2018) "I think I would pay attention better, as the brain thinks better when the body is active. I also think that I would be more positive towards the class." (Student Survey, 2018)
	Health	A level of body activity focused on improving health or fitness; not being stationery or sedentary.	"Being physically active instead of sedentary would be hugely beneficial! It's always struck me as a little ironic/unfortunate that I teach exercise science and my students are sedentary for much of the time." (Faculty Survey, 2018) "I think that it would allow students to be more active instead of having to sit all day". (Student Survey, 2018) "There are numerous amounts of benefits that come along with an active workstation…it can strengthen muscles, burn fat and even relieve stress while we are in class." (Student Survey, 2018)
	Learning Style	A student's preferred way or method of understanding the course information; when a student prefers movement options while learning.	"It's about learning styles. Some students begin to understand why they weren't getting all the information before. It's also about practicing what we preach. Research shows movement helps with learning, thus we are demonstrating that in this space." (Expert Interview, 2018) "I believe letting them move their bodies in a kinesthetic classroom will help them

			focus and also be more willing to try new things, especially for the students who do not meet the recommended guidelines for physical activity each week." (Faculty Survey, 2018) "there are so many benefits especially for people who are not auditory or visual learners in which lecture is torture." (Student Survey, 2018) "My opinion of a kinesthetic classroom is that it serves to fulfill the different needs of students. This would have positive effects on my learning because during moments where I may feel tired, I can start moving around freely." (Student Survey, 2018)

APPENDIX J

BOARD OF VISITORS GRANT PROPOSAL

Will this proposal involve other groups on campus? Yes
If you answered yes, who?
It is the envisioned that through this grant we can create an innovative learning space to be utilized as classroom space and open to faculty campus-wide.

How many students do you hope to impact? 100+

Amount requested: $50,000

Figure 3. Budgetary Summary: Kinesthetic Classroom

Applicant Name: Meaghan Howard

Brief Itemization	Amount
Kinesthetic Classroom Equipment:	$47,400
Supplies and Materials: Printing or supplies needed for planning team	$33
Contracted Services: On-site Training	$1000
Travel: Training Registration	$695
Travel: Mileage	$150
Travel: Lodging	$432
Travel: Food	$40
Other Expenses: Incentives for faculty/curriculum feedback (Gift cards)	$250.00
Total Requested / Awarded	**$ 50,000**

Detailed Budget and Narrative

The cost of implementing a kinesthetic classroom is approximately $50,000 (see Budget attached). The exact costs can be determined once: 1) a location and dimensions of the space are reported to Kidsfit, and 2) the design and capacity of the classroom space is chosen. The specially designed kinesthetic classroom desks range in price from $1,095 for a single active desk up to $4,995 for 6-person active desk option. In the classroom that was observed at a regional university [University A], there were a total of 32 workstations and one for the instructor. The company also offers discounts for organizations who send a representative to attend the Action Based Learning trainings. Thus, this request also builds in the cost of training one faculty member. The cost of the training is $695 for a 3-day training; two viable options exist in Wilmington, North Carolina (June 24-26, 2019) or Charleston, South Carolina (July 17-19, 2019). Travel cost are being requested to cover mileage, lodging, and food expenses not covered by the

training. All other costs reflect either supplies needed for the planning team or incentives for faculty feedback of the kinesthetic classroom (see Timeline attached).

Figure 4. Timeline: Kinesthetic Classroom

2019												
TASK	**Feb**	**M**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oc**	**Nov**	**Dec**	**Ja**
Develop planning team												
Contact Kidsfit for												
Plan team meet to												
Obtain quote from												
Kin Classroom												
Attend training for ABL												
Host ABL training for												
Student												
Survey on usage fac/stu												
Report results												

Purpose

In 500 words or less, describe the purpose of your grant, why a one-time grant is needed or would enhance the student experience and the impact the grant will have on the student experience at My University. Please remember that BOV grants are intended for one-time enhancements only. Programming that requires on-going support will not be funded. (You will be contacted if further details are needed.)

Many faculty are concerned with ways to enhance student learning and engagement in the classroom. We know students do not all learn and apply information in the same ways; some are strong auditory learners; others are strong visual learners; and some students learn best through movement. Research already supports that standing, movement, and exercise influence learning, improve brain function, and expand the processing of information (Mehta, Shortz, & Benden, 2015) Thus, a classroom that allows students the flexibility to choose from a variety of postures during class time is one way to enhance the student learning experience. An "active permissive environment" (Lanningham-Foster, et al., 2008, p. 1849) is a simple approach that allows students to decide if they learn best in a seated or active posture (i.e. standing, balancing, or moving). Based on active learning theory, pedagogy that involves students in the learning process and encourages participation is more effective than passive listening (Bonwell, 1991). *Kinesthetic classrooms* expand this theory and complement active pedagogy to incorporate actual movement during class time. Movement prepares the brain for learning and aids students to connect and process information more efficiently (Blaydes, 2000). During learning the brain takes in information and links it through both implicit and

explicit learning. Typical school work focuses on explicit learning, skills that involve rote memorization; however, implicit learning happens intuitively as the brain is making connections between the information, context, and environment (Frensch & Rünger, 2003). Implicit learning is driven by body movement and some of our students learn best in this manner. Kinesthetic classrooms facilitate this type of learning.

Kinesthetic classrooms include various forms of flexible, moving workstations, such as standing desks, cycling desks, glider desks, and specialized seating to promote balance and core muscle strength. Many of these have been implemented successfully in K-12 school classrooms. I believe we can effectively facilitate kinesthetic learning for university students as well. It is imperative that as a university we inform ourselves about the impact the classroom environment on both student learning (Jamieson, 2003), engagement (Axelson & Flick, 2010) and ultimately the student experience at Our institution. Active learning models have successfully demonstrated that student-centered pedagogies have a positive influence on learning and motivation (Adedokun et al., 2017). Further research posits that active workstation use during class time would be welcomed by a majority of students (Benzo et. al, 2017). I assert the next logical step is to create a kinesthetic classroom at Our institution to enhance the student learning experience, especially for our kinesthetic learners.

Since curriculum within Sports Sciences is geared toward increasing physical activity both in knowledge and practice, this provides a rational place for the housing and maintenance of a kinesthetic classroom. However, I do not see this learning space as limited to Sport Sciences use; rather, I can envision this innovative space being open to faculty across campus and disciplines. It will allow the faculty at Our institution an innovative space to expose students and expand our knowledge of the student learning experience.

APPENDIX K

ONE-PAGE FACT SHEET

Figure 5. Fact Sheet: Kinesthetic Classroom

Kinesthetic Classroom:

Moving towards an active model

Quick Facts:

- **53%** of *Faculty* are in favor of a kinesthetic classroom
- **65%** of *Students* are in favor of kinesthetic classroom
- **73%** of *Faculty* would like to teach in a kinesthetic classroom
- **72%** of *Students* would like to change postures during class
- **86%** of *Faculty* would be in favor of having standing desks in their classrooms

The Process of the 6-P's

Theme 1 – Probe It is vital to assess the department for readiness to use a novel learning space such as a kinesthetic classroom. Find out who is on board.

Theme 2 – Plot Address administration concerns; provide information on costs and funding sources for the active workstations, as well as ways to deal with maintenance. Also in this theme, action is taken to inform and rally support from members of the community. Faculty buy-in is essential to the success of the approach. Share the reason and purposes for using this approach for our university. Work to find funding options for the active workstations!

Theme 3 – Plan Gather decision-makers to propose locations and layout for increased functionality and ways to minimize physical limitations, to comply with the Americans with Disabilities Act. Once other members of the campus community are on board, it is possible to move forward in the process.

Theme 4 – Prepare Focus on the faculty! Equip them to effectively use the space. Share ideas and assist in developing pedagogy and learning techniques. Faculty may need ways to account for distractions from learning. Training during this theme will allow faculty to better prepare for acclimation and issues of classroom management.

Theme 5 – Practice The kinesthetic classroom is in place, so bring in the students! Faculty must try methods to effectively engage and assist students in areas of alertness, focus, and ward off distraction.

Theme 6 – Prove Provide evidence as to the value of the kinesthetic classroom; it is in this theme when the impact of the novel learning environment on learning can be measured. Faculty are able to evaluate the effects on student engagement, learning styles, and health.

Figure 6. The 6-P's: A Framework for Implementation of a Kinesthetic Classroom