

## The Impact of Classroom Design on Active Learning

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### Abstract

This paper explores the impact that flexible seating has on the use of active learning in a college classroom. I found that the traditional layout of a college classroom made it difficult for me to get my students engaged in the material and collaborating in an effective way. After purchasing moveable tables and chairs with attachable whiteboards, the use of collaboration and active learning was analyzed to see if the environment had an impact on the pedagogy within a classroom. It was found that collaboration was easier to accomplish in a flexible seating classroom and, in general, the students seemed to feel more comfortable participating in a classroom that offered flexible seating.

*Keywords:* flexible seating, collaboration, active learning, higher education

### The Impact of Classroom Design on Active Learning

“...academic architecture is a kind of crystallized pedagogy and [that] buildings have their own hidden curriculum that teaches as effectively as any course taught in them.” (Orr, 1993, p. 226)

In the 21st century, classroom learning has become redefined. When you enter elementary and middle level schools now, instead of rows of desks and a chalkboard up front, you most likely will see a variety of seating options such as exercise balls, high tables, and carpet space. Chalkboards are a rare commodity now as whiteboards, specifically interactive ones, have replaced many of the traditional chalkboards. Students may also be seen with one-to-one devices such as iPads or chromebooks. Learning is now more hands-on and personalized than it ever has been.

This shift in classroom learning can be seen in the majority of elementary classrooms; but in higher education, the classrooms are still mostly traditional. Most university classrooms that you walk into have rows of individual desks and a podium up front for the professor to lecture at. When universities began, lecture was a necessity because books were not readily available for students (Park & Choi, 2014) as they are today. Lecture was the only way for students to attain knowledge of the subject. In the 21st century this is not true as anyone can Google something and have the knowledge at their fingertips in seconds. This ease of access to knowledge may need to have universities reconsidering their classroom layouts. This research looks more closely at how the classroom layout does impact the college classroom.

### Research Questions

The following research questions were used to explore this topic:

1. In what ways does classroom design affect collaboration and critical thinking in a college classroom?
2. How do elementary education majors describe their experiences with flexible seating opportunities in a college classroom?

### **Purpose of Project**

In this study I addressed active learning along with the twenty-first century skills of collaboration and critical thinking. Education is moving towards a STEM (Science, Technology, Engineering, and Mathematics) focus. One of the goals of STEM education is to teach students the twenty-first century skills of collaboration, creativity, and critical thinking (Reagan, 2016). I teach pre-service teachers who are going to have to one day teach their own students these skills, so it is imperative that I model them for my pre-service teachers. Thus, I try to make my classroom an active learning classroom with a variety of methods for modeling collaboration and critical thinking. I find it difficult, though, when the classrooms are set up for teacher directed instruction and are not easily adapted. Therefore, in this study I examined how twenty-first century seating options in a classroom can impact learning and the use of twenty-first century skills for our students.

### **Methodology**

This study was qualitative and, although the researcher participated in the classrooms being studied, it was mostly phenomenological in nature because the researcher was looking at the experience that college students have in flexible seating environments (Sauro, 2015).

This study took place over two semesters and the students in those semesters stayed mostly the same, although there were a few changes from fall to spring. They were all elementary education preservice teachers who were at least in their sophomore year of college.

The preservice teachers were given an online survey at the beginning and the end of each semester regarding their thoughts about flexible seating versus traditional seating. These surveys were coded for common themes and patterns. Observations were also made from the researcher and kept in a personal journal throughout the two semesters.

An education professor that taught in the room with the flexible seating was also interviewed and asked questions about classroom design and active learning. That interview was transcribed and coded for common themes and patterns.

## **Results**

Flexible seating can mean many different things to people, which is why I began my first survey with a question of how the university students defined flexible seating. Their responses varied, but the overall consensus was that flexible seating allows choice, opportunity, and options for students in a classroom. The furniture purchased for this research gave students those options by being easily moveable so students could work in groups, pairs, a circle, or even traditional rows. The entire room was not changed either, which still provided some traditional desks as an option for seating. In Appendix A you can see the comparison between the traditional room and the flexible seating room used for this research.

The responses from the online survey revealed that the students in this study overall preferred flexible seating to traditional. When asked how they feel in a traditional classroom the majority of students mentioned that they felt alone or overwhelmed. One student said it made them feel like “the teacher doesn’t want to interact personally with the students.” Another mentioned that when they walk into a traditional classroom “it means the professor is going to lecture at you.” One student mentioned feeling familiar in a traditional classroom because there is “nothing out of the ordinary, comfortable in the sense that I know how to navigate/choose a seat in the class.”

When asked how they feel in a flexible seating classroom the responses were much more positive. Students in general felt more excited and comfortable. One student mentioned, “I feel as though the teacher already has an open mind to other things and suggestions.” This could lead to better relationships between students and teachers, which could change the whole dynamic of a classroom because research shows students are much more engaged in classrooms where there is a positive student and teacher relationship (Goodman, 2015). Another student mentioned, “You know that the class period will engage you, and you never know exactly what you’ll be doing.”

In general, these students seemed to really value collaboration and communication in a college classroom. When asked what the level of collaboration is in a more traditional classroom versus a flexible seating classroom it was clear that the students felt the level of collaboration was much higher in a flexible seating classroom. One student said, “When I am in a traditional classroom setting and the teacher says we are going to collaborate, most of the class is not excited and moans at the thought of

taking so much time and effort to collaborate.” In a flexible seating classroom the time and effort it takes to collaborate is not as tedious because the tables can easily be moved around and the classroom is set up to more easily get into groups. Several students mentioned the issue of desks being too difficult to move into groups when there is a traditional classroom setting.

When asked about the level of collaboration in a flexible seating classroom, the responses were much more positive. One student said, “It is SO easy. The students are already in groups and facing each other making collaboration the easiest thing in the classroom.” Not only is it easier to get into collaborative groups, but I found that most students felt comfortable when collaborating. One student mentioned, “We’re able to discuss better with each other, and the class feels less intimidating because we’re able to work together.” More results from the online surveys can also be seen in the complete construct tables (Appendix B).

A professor who currently teaches in the classroom where the flexible seating was put was also interviewed (see Appendix C for transcribed interview) regarding her thoughts on the implementation. The findings from the interview were very similar to the online surveys from the students. Relationships came up as a big positive for her in the flexible seating classroom. She mentions, “It encourages relationships,” and goes on to specify that this is not only relationships between student and teacher, but also between peers.

While her views were very positive regarding the use of flexible seating, she also managed to tie it into the strategic plan on campus and show why this type of seating is

important to have in a college classroom. The professor mentioned:

our strategic goals on campus involve improving soft skills and communication and those are the areas; this is one way to increase that and encourage that among students so they can learn to look at someone face to face when they're speaking, all of those soft skills, to present, to share, to have discussions, agreements, pros and cons, whatever, in an appropriate way. So if they don't ever get to talk to each other they're not going to develop those soft skills they need when they get out into the workforce. So, I think it would improve communication and soft skills across the board no matter what their content area is.

The results from the online survey and the personal interview both show flexible seating as a preferred option for a college classroom. Students and professors both felt more comfortable and engaged when they were in a flexible seating classroom as compared to a traditional classroom.

During this research I also kept personal notes regarding things I noticed. The notes I took discuss the differences I noticed in student engagement when I taught in the traditional classroom versus the flexible seating classroom. When looking at the notes it is clear that my teaching was impacted by the classroom setup. Several times I mention wanting to do a group activity in a traditional classroom but having students push back because they either didn't want to move desks around or felt there was not enough room. Notes from the flexible seating classroom, though, show that I was engaging students more in literature circles and other active learning strategies.



All of these results show that collaboration and communication can increase if the classroom is set up to allow for easier group work and has ample room for students to move around. The elementary preservice teachers involved in this study overwhelmingly felt more comfortable and at ease in flexible seating classrooms.

### **Future Implications**

Park and Choi (2014) argue that space can either enable or inhibit different styles of teaching and learning. Through this research I had hoped to explore that more and see if the setup of the classroom would change the level of collaboration and communication taking place in a college classroom. The results leaned towards this idea that yes, the space does impact the teaching and learning that takes place within the classroom. When students were given flexible seating options and were able to move around the setup of the classroom they had more opportunities to engage in their learning.

In the 21st century, one of the focuses on student learning is collaboration. It is so much easier to communicate globally now and most job opportunities will require students to have communication skills for those global connections (Nichols, 2019). In order for our students to gain these communication skills we need to have them collaborating in a classroom environment where we can also provide tools to them for engaging in effective ways. It was clear through these results that students were given fewer opportunities to collaborate in traditional classrooms. With the 21st century changes in learning, universities need to rethink learning spaces to allow learners opportunities to collaborate. Beckers, Voordt, and Dewulf (2016) provide data that

showed higher education students felt like the setup of the learning space impacted the amount of collaboration. This matches what preservice teachers in this study mentioned as well. Thus, it is clear that the classroom setup should match the preferred style of teaching and allow our students to come in feeling comfortable and ready to collaborate with the professor as well as their peers.

Through this research I hope to continue advocating for an active, engaged campus with classrooms that allow students opportunities to interact and collaborate. These results will hopefully influence university campuses to consider more flexible seating options for their students.

### **Personal Reflection**

When I began this research I had approximately 12 students and, while purchasing furniture, I was astonished at the high price tags! For that reason, I decided to only buy moveable furniture for half of the room to save costs and, at the time, that suited my classroom needs. Currently I have 21 students and I find it more difficult to accommodate for them all because only half of the room is equipped with moveable furniture. I have found, though, that some students still prefer to sit in individual desks and I appreciate the flexibility of this room in allowing students to choose whatever seat makes them more comfortable. I do feel like my engagement and collaboration could increase even more, though, if the whole room allowed for flexibility.

Even with the room only being halfway moveable it has been very helpful to me in teaching my elementary preservice teachers because I feel like we can more easily move into groups or pairs to discuss things. When we do hands-on activities it is also a

lot easier to prepare those activities and allow students time to really explore them. I am very pleased with the results of this research and the furniture that I was able to purchase. I have also since heard other professors who teach in that room comment that they appreciate the flexible seating. Possibly down the road I can find a way to incorporate the entire room with flexible seating but, for right now, it is a positive change on campus.

## References

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## Appendix A

### Traditional Classroom

Whiteboard, screen, projector, computer, individual desks, little light



### Flexible Seating Classroom

Chalkboard, interactive whiteboard (on left wall), projector, computer, document camera, moveable tables, moveable chairs, individual whiteboards, individual desks



Appendix B  
Construct Tables from Online Surveys

Definition of flexible seating	Supporting quotes	Survey #
Different	"Depending on the teacher, grade, and class it will look different"	#1
Moving	"being able to move seating to fit your lesson planning"	#1
Flexibility	"The ability to reasonably sit wherever in a classroom"	#1
Choice	"Students are able to choose where they would like to sit out of a variety of seating"	#1
Moving	"able to move around the room freely"	#1
Choice	"Allowing students to pick their seats"	#1
Non traditional	"The opportunity to sit in a non traditional desk or seat"	#1
Choice	"having options when determining where to sit"	#1
Choice	"where students do not have assigned seating"	#1

How students feel in a traditional classroom	Supporting Quotes	Survey #
Overwhelmed	"Sometimes it can be overwhelming to find a seat"	#1
Familiar	"that is just what I am used to from grade/high school"	#1
Neutral	"This is going to be a typical class where the teacher does lectures"	1
Bored	"bored"	1
Familiar	"it's normal to me"	1
Closed in	"If there are too many desks in the room it's tight"	1

Bored	"It feels dull and boring to sit in a traditional classroom"	1
Familiar	"just a normal classroom"	2
Alone	"it is difficult to collaborate and work as a group"	2
Familiar	"It's what I am used to. I tend to like it and be at the front of the class"	2
Alone	"it feels like no cooperative learning happens."	2
Alone	"Like the teacher doesn't want to interact personally with the students."	2
Bored	"Bored and uncomfortable"	2
Alone	"it means the professor is going to lecture at you."	3
Alone	"not have a lot of opportunities for collaborative learning"	3
Familiar	"nothing out of the ordinary, comfortable in the sense that I know how to navigate/choose a seat in the class"	3
Boring	"I feel the setting is monotonous, a little bit boring"	3
Overwhelmed	"If the desks are in rows, I almost feel as if I'm being tested."	3
Closed in	"I feel cramped. I feel as though there isn't enough space for me to be comfortable."	3
Alone	"collaboration is not as easy"	3
Alone	"Like it's time to listen to lectures, and make myself pay attention"	3
Boring	"Very bored, outdated."	3
Categorized	"I feel as if I am not an individual but another doll on the shelf."	3

Closed in	"In some classrooms, it's very claustrophobic and seems too perfect."	3

How students feel in a flexible seating classroom	Supporting quotes	Survey #
Excited	"I get excited because it is not the norm"	1
Overwhelmed	"I would feel slightly overwhelmed because of the different options"	1
Overwhelmed	"It can sometimes look chaotic"	1
Excited	"excited!"	1
Excited	"I feel like it's more of an enjoyable environment"	1
Different	"it's different. Not bad"	1
Comfortable	"I feel as though the teacher already has an open mind to other things and suggestions"	1
Excited/Comfortable	"When there are different arrangements of seating in classrooms I feel excited and more comfortable"	1
Comfortable	"it is more inviting"	2
Comfortable	"it makes me feel as though the teacher already has an open mind"	2
Okay	"I don't mind it"	2
Excited	"I like it because it allows for cooperative learning to take place."	2
Excited/Comfortable	"I can sit where I want to make myself comfortable to learn"	2
Comfortable	"More comfortable and engaged"	2
Excited	"You know that the class period will engage you, and you never know exactly what you'll be doing"	3



Excited	"I get excited because if we want to do an activity that requires the room to be rearranged it is easier to do"	3
Excited	"I can maybe expect a little more communicating and interaction between students than just teacher and student"	3
Excited	"I am curious what will be the activity for the day"	3
Comfortable	"Sitting in the same desks all day gets tiresome and makes my back hurt after a while. I like having the option of something more casual and comfortable and something more formal with a tabletop"	3
Excited	"I feel like I'm in a classroom more geared towards learning"	3
Excited	"it makes working in groups easy to do"	3
Comfortable	"I feel relaxed, in all of my flexible seating classes we participate as much as we listen. We get up and interact, brainstorm, it feels much more interpersonal than traditional seating classes."	3
Comfortable	"relaxed"	3
Comfortable	"Relaxed. I can be comfortable in my seat and my own skin"	3
Ease	"the class can move the desk and chairs as needed depending on the activity"	3

Level of collaboration in more traditional classroom	Supporting quotes	Survey #
Low	"Typically, the desks/type of seating does not allow for movement to allow better communication"	1
Low	"in rows it is very much like separation and not open to discussions."	1
Low	'It depends on the teacher and students surrounding you. But let's just say low"	1
Low	"Collaboration can still be done but ...it's not as open"	1
Low	"it's hard to work in groups when you can not move the tables around"	1
Low	"it's harder because everyone is so lined up"	1
Low	"Hard to move around"	1
Low	"It is difficult and awkward to arrange to collaborate"	1
Okay	"It isn't hard but it isn't the easiest either"	1
Low	"when I am in a traditional classroom setting and the teacher says we are going to collaborate, most of the class is not excited and moans at the thought of taking so much time and effort to collaborate."	2
Low	"It's more difficult, you can't scoot to a new location or just turn"	2
Low	"Very little collaboration happens in a more traditional classroom."	2
Low	"moving around or into groups is a mess"	2

Low	"it is really hard to collaborate in a traditional classroom because the desk is hard to move"	2
Low	"zero collaboration"	3
Low	"There is very few opprotunities, and if there is, you work with the people around you so you don't have to move."	3
Low	"There is hardly ever collaboration because it is usually a lecture type classroom"	3
Low	"Limited interaction and there is less convenient to converse with the classmates"	3
Low	"Rows of desks are not conducive to an environment of collaboration"	3
Low	"There's generally not collaboration in traditional classroom settings"	3
Low	"It is hard to sit in groups when the classroom is set up in rows and it is less efficient for moving around"	3
Okay	"It can vary based on encouragement from the curriculum, or teacher"	3
Low	"The desks and chairs are not easy to move." "It feels forced and awkward"	3
Low	"it is hard to navigate because we cannot rearrange the desks as necessary when discussions are taking place"	3
Low	"I think there is little to no collaboration in the traditional classroom. Desks and chairs are harder to move"	3

Level of collaboration in a flexible seating classroom	Supporting quotations	Survey #
High	"It allows students to move and be more motivated to talk and work together"	1
High	"you are normally in groups and are allowed to talk to each other"	1
High	"Collaboration is easier to accomplish because the seating can be easily moved around"	1
High	"Lots of collaboration, it is much easier to talk and be in groups"	1
High	"It's a lot easier because there are groups of people instead of lines"	1
High	"Easier to move around"	1
High	"There are also multiple ways to get out of your seat"	1
High	"It is SO easy. The students are already in groups and facing each other making collaboration the easiest thing in the classroom."	1
Okay	"It depends too much on the subject and the teacher/professor"	2
High	"If we need to move again or add a seat it is very easy and quick to do so."	2
High	"Seats move easier."	2
High	"Easier because less traffic of people in certain spots because furniture can move."	2
High	"It is much easier to get in small groups when your desk is on wheels"	2
High	"The teacher moves the desks into formations when	3

	they want you to collaborate”	
High	“You can move your classroom around at a moments notice to be able to work in groups.”	3
High	“It’s a lot easier to move seating around to form groups.”	3
High	“I am more comfortable, ease, easier to communicate because I am free and flexible where I can seat.”	3
High	“The free choice of seating options makes it easy for groups to choose where they want to work.”	3
High	“We’re able to discuss better with each other, and the class feels less intimidating because we’re able to work together.”	3
High	“Since the chairs and tables move easily groups are easy to form and mix it up.”	3
High	“In flexible seating classrooms we often collaborate to practice our comprehension and application of what’s being taught.”	3
High	“The room can be rearranged as needed and when in class I can sit by those that can enhance discussion and share the same ideas as me and we can bounce ideas off of each other easily.”	3
High	“The tables and chairs are easy to move and little noise is made, not disturbing the other classrooms.”	3

Rate the importance of the following to you in a college classroom (1 being least important, 5 being most important)					
	Being comfortable	Having opportunities to collaborate with students	Having more choice in room layout	Having opportunities to think critically	Having a clean, organized classroom
Student 1 Survey 1	5	4	1	2	3
Student 2 Survey 1	2	3	1	4	5
Student 3 Survey 1	3	4	1	5	2
Student 4 Survey 1					5
Student 5 Survey 1		4			5
Student 6 Survey 1	4	2	1	3	5
Student 7 Survey 1	3	4	1	5	2
Student 8 Survey 1	1	3	5	4	2
Student 9 Survey 1	1	4	3	2	5
Student 1 Survey 2	3	2	1	5	4
Student 2 survey 2	5	2	1	3	4
Student 3 Survey 2	2	4	5	3	1
Student 4 Survey 2	3	5	4	2	1
Student 5 Survey 2	1	4	5	3	2
Student 6 Survey 2	4	5	2	3	1
Student 1 Survey 3	3	4	2	5	1
Student 2 Survey 3	5	2	1	4	3

Student 3 Survey 3	3	5	1	4	2
Student 4 Survey 3					4
Student 5 Survey 3	2	4	3	5	1
Student 6 Survey 3	5	4	2	3	1
Student 7 Survey 3	3	4	1	5	2
Student 8 Survey 3	3	5	2	4	1
Student 9 Survey 3					5
Student 10 Survey 3	1	2	4	3	5
Student 11 Survey 3	1	5	3	4	2

Do you agree that the architecture of a class can be a curriculum itself?	Supporting quotations	Survey #
Yes	"I believe setting kids up for socializing can stimulate learning, and can teach kids communication skills."	2
Yes	"it is the limit to which you can collaborate, do projects, and work independently"	2
Yes	"Students interact and learn skills."	2
Yes	"sometimes students learn more from perspectives other students"	2
Yes	"The architecture of a class is the rules of the classroom and how each student interacts with each other."	2
Yes	"some of the best class periods are when the teacher lets the students lead and we end up teaching each other."	3

Yes	"Having students figure out how to work collaboratively in the classroom is essential, and that is doable in a flexible seating classroom."	3
Yes	"depending on how the room is structured forms what a teacher is most likely going to teach through the year. If desks are arranged in small pods there is most likely going to be group discussions and more collaboration, than a classroom with desks aligned in straight rows." "it can allow them [students] to develop the needed skills for the real world"	3
Sort of	"Not necessarily as part of the curriculum but perhaps as part of the environment to be conducive for learning"	3
Yes	"in an unorganized, messy classroom, there is too much room for distraction."	3
Yes	"I believe the architecture of a classroom can teach students lesson students about cooperation." "students learn to talk with one another, ask important questions, and learn the content."	3
Yes	"Being able to feel comfortable, work with peers, and have a well put together classroom can change the outlook on the class for the student."	3
Yes	"The way a classroom is set up sets the precedent and mindset of what's being encouraged and accepted of all those walking into it."	3



Yes	"If students feel safe and comfortable in their learning environment they are more likely to stay and relax."	3
Yes	"students must understand how the classroom works"	3

## Appendix C

Interview

Professor #1

Female

3/1/19, 9:30 am

Sophia: My question to you ,first one, how long have you been teaching in Centennial Hall, 103?	
P1: Um, since 2012. I taught EDUC 1040 for 3 years, 6 semesters, and then I switched to , 1040 is foundations of educations so it was a typical classroom, um typical course. Then I started teaching field experience courses in um 103, so 1104 and 1164 are beginning and mid field experience courses, so we only meet 4 times each in that classroom. So, I've been doing that since 2016.	
Sophia: and then are there other classrooms that you teach in on campus that do have this flexible seating similar to this in 103?	
P1: No, not at all. The only other classroom I taught in was a computer lab, completely the opposite. I couldn't move through the classroom with all the computers, were, the desks were four/five rows all up against one wall. So, I couldn't even move among my students. I could only walk down one side of the classroom. I couldn't get in between. So it was very restricted.	
Sophia: So it was congregated on just one side of the classroom?	
P1: It's, well, it was four, one two three four, probably five computers in one row and it was up against one wall so I could go down the aisle on the left side of the classroom and up at the front. So I was constantly walking this L shape and trying to get near my students and look at what they were doing when they were in collaborative activities. Very difficult. And when they needed to move to other groups, same thing, move a chair, move around each other, they couldn't even move in the aisles. So it was very restrictive. Not good. (laughs)	

Sophia: So, what did you think when you first walked into the classroom and saw that there were different seating options, as opposed to the computer lab.	
P1: As a teacher I got very excited, I did, I was so happy. The classroom climate was much lighter immediately. It's more conducive to talking and sharing and doing activities. So, like, either prep activities or reflection activities. In rows it is more formal, so it's informal, more comfortable setting. I'm trying to think, it encourages collaboration, discussion, easier to do activities, it's more comfortable so it like reduces anxiety I think, so it's a much friendlier, more conducive to learning.	
Sophia: So, I'm just curious, what is the set up of this classroom as opposed to more formal rows. Like, how is it like set up?	
P1: Every time I go in it's different. There are desks all across the back for overflow because we have, what, 18 seats?	
Me: Um, for the desks? I think it is 16.	
P1: I think it is too because one of my classes had a little bit more than that so we either pulled up chairs to those tables or a couple people pulled up a couple desks to add to the groups. Um, sometimes they're in sort of rows, like two rows facing the front. Other times they are pushed together for groups where 8 people can sit around them. They are rarely in the same formation when I go into the room. So, I enter and depending on what we are doing we rearrange and usually there's one or two students that are early birds and they help me throw the desks together into 3 groups or pull them apart into corners depending on how far apart the groups need to be, So, it's very different.	
Sophia: So, how has your class adapted to this flexible seating and what issues have you seen from that, but also what positive things have you seen from that?	
P1: I think they have adapted very well. As I mentioned earlier some of our students don't enjoy working in groups, we have a very high ability level, especially this campus, so they need to develop those soft skills. So I'd say there are some that don't particularly like it as much as others but for the	

<p>most part they have really adapted well. The face to face interaction is amazing um they are more likely to talk and share when they are in that type of group and we can accomplish it faster. Like, ok now everyone make groups of 3, and with those big desks moving around it's an issue. In this case you are already there, everything moves, it makes the transitions from activity to activity, so we end up doing a wider variety of instructional strategies. We have gone more paperless because we have the whiteboards, a lot of things we used to do on paper so there is less of that. Um, multiple representations. Research supports getting things many different ways, so it allows you, you can lecture first then you can try it, you can model the teaching and let them experience it, not just listen about it. The classroom climate is less formal I think, it makes students more comfortable and more likely to talk. And, um, it encourages best practices in teaching, another positive. And learning, it uh, communication is one of the big things in our strategic plan on campus and soft skills, that that's one of the things our employers and the community has said that our students need to be better at and so this encourages that, all those communication skills, those soft skills, hands on activities. The only negative problem that I see is, and we've talked about this, we need locks on the wheels because they do roll away and some tables have locks. And then, um, when the students come in they prefer, I think, to sit there, most of them. So if someone doesn't like it they go off and sit by themselves and it looks more like isolation, so it would be better if the entire class was the same and, or if the students who preferred it come in and get that first and then the last ones in, it's like punishment, you know, like oh darn I've got to fit in one of these ugly desks, or these slanted desks, instead of with the group. I think it needs to be an entire class full of them, the same thing.</p>	
<p>Sophia: Do you feel like the flexible seating has changed your teaching methods at all?</p>	
<p>P1: A little bit, I always did activities but like I said the transitions took longer. To get them into groups made it a little more difficult, but I am maybe doing more activities easier and paperless. I was using</p>	

<p>paper a lot of times when I didn't have to, now I don't have to, so instead I was taping things to the walls like post it notes. Now we don't have to do that. We can use the whiteboards, they can move to corners, so it has made it a little bit more paperless, transitions a lot smoother, and I am more likely to do more activities in one setting than I could have with the desks I think, especially with larger groups. It is harder to do activities in those desk settings with large groups.</p>	
<p>Sophia: The layout of a classroom has been called a hidden curriculum by some theorists. Do you support this idea of a classroom being a curriculum and in what ways?</p>	
<p>P1: Yes, because research best practices in teaching involve a variety of instructional strategies and multiple representations of the same concept instead of just straight lecture. That is just one mode. And if you have tables that will move easily and students that can move easily and share they're going to have time to process and reflect and that creates retention. So if you want your students to remember things you need to do more than just straight lecture and I think that classroom set up lends itself to those activities where they can reflect and process and discussion amongst themselves to remember things better. And the other is classroom climate. As far as comfort level goes, students are going to perform better when they are comfortable, they are going to talk more to each other when they're comfortable and that kind of setting helps students communicate with each other at a more comfortable level. It's a more relaxed atmosphere.</p>	
<p>Sophia: And then do you prefer a traditional or non traditional classroom to teach in?</p>	
<p>P1: Absolutely non! It encourages relationships, not just with the teacher and the students, like one of my classes has 8 students in it so we push two tables together and all sit around together and, relationships, um, research shows that, Comer was the one that said without a relationship there is no learning. So, it helps you develop relationships with your students more, especially since I only see them four times a semester. Um, but it also encourages relationships amongst your students and they will</p>	

<p>communicate more and share more and they will learn more by doing so, so it gives them that practice of bringing people together. So, um, the relationships is huge, collaboration is huge, it gives them practice and exposure to the strategies they are going to use when they are teaching themselves. It is one thing to learn about all of them, it's another to participate in them, and get a comfort level for it. A lot of cooperative structures, you try them once with your class, and oh it doesn't work I'll never do it again, so if they are comfortable with it in their own classrooms they will be more likely to try it and keep trying it in their own classrooms when they teach. So, it's leading by example and modeling. Um, engagement, student engagement is huge. Our preservice teachers will be evaluated on student engagement so they need to know what that looks like and what it feels like and this type of classroom climate encourages student engagement. It shows them what it's supposed to look like. When you have student engagement, learning increases. So, with this, it all lends to their learning increases and then when they become teachers knowing that they need to have their students engaged to increase their learning, so it's kind of a trickle down effect as well.</p>	
<p>Sophia: And then, would you recommend this type of arrangement in other college classrooms?</p>	
<p>P1: Absolutely. And, I know that I look at it from an educator's perspective for preservice teachers, but again our strategic goals on campus involve improving soft skills and communication and those are the areas, this is one way to increase that and encourage that among students so they can learn to look at someone face to face when they're speaking, all of those soft skills, to present, to share, to have discussions, agreements, pros and cons, whatever, in an appropriate way. So if they don't ever get to talk to each other they're not going to develop those soft skills they need when they get out into the work force. So, I think it would improve communication and soft skills across the board no matter what their content area is. It helps their retain and absorb their information. They get the time to process and reflect, if, um, I'm trying to think of where it came from. There's a pyramid of instructional strategies</p>	

and the least effective is at the top of the pyramid at 5% and that's lecture. And, we're moving away from that at higher education but I think predominately in large classes it's often straight lecture, take notes, and that is the least effective way to learn. So, this moves you away from that to giving students time to process and reflect and retain that information.	
Sophia: So, what is the most effective? I'm kind of curious as opposed to lecture?	
P1: The most effective, at the bottom of the pyramid, is teaching it to someone else. If you really know it, you can teach it. So, assignments like jigsaw where you divide up the content, have each person or group become a master at their portion and then present it to the class, they will remember, or get back together and share it in each group, they will remember the content because not only did they see it, learn it, listen to it, they organized it in a way that made sense to them, and then shared it with someone else. So, that's like repetition, repetition, repetition, and then you retain it. So, and they've discussed it with others, so anytime you can teach it to someone else you have complete mastery of your content.	
Sophia: Since I know the majority of classes on campus they are lecture based so it is a matter of taking notes, doing the homework, turning it in, and it's kind of a never ending cycle. What pushes would be important in order for it to maybe lean more towards a teaching mastery as opposed to just lecture?	
P1: I think, it takes years to make major changes in education, and it will take time. And I can see it across this classroom with flipped classrooms where professors are giving the information in advance so you can watch it, take notes, do whatever you want with it, but be prepared that when you come in then there is application of it you do something together you discuss it you analyze it, the critical thinking, so the meat of it in the classroom is doing something with the information, not just getting, not just, we call it sit and get. Lecture is sit and get, it's not the most effective way to learn, so it's putting all the responsibility on the individual student to go learn the material by	

themselves. So, a lot of um, like CAFÉ is an organization on campus that supports, what does it stand for?	
Me: The Center for Advancing Faculty Excellence.	
P1: And they do workshops for teachers, bring in speakers, and are encouraging professors to do more than just lecture, more experiential learning and I can see that is taking hold. I think it will come in waves and as new faculty come in with these ideas and as the older faculty retire I think you will see more and more change too, more experiential learning. That's also part of our strategic plan for the university, more experiential learning. So, it's getting to the professors in a way of thinking, and getting out of that lecture just sit and get mode that teaches students to talk to each other and then putting the learning into their hands, So you can give them materials but then create your assignments as authentic assignments where they are taking whatever you are teaching and applying it to real world or putting it into practice, something more than just lecture and note taking. And I think in the past, study skills groups, all of those things that students do outside of the classroom when they meet and study together and do those, they are supplying that themselves. But it would be better if the entire class was involved and you could get to see different representations of it. For example, we did a, oh the lesson was on the way the brain works. And there were 6 things we wanted to remember and I had each group of students, by content area, do visual cues for those 6 things, so the math teachers did it together, the English teachers, the social sciences and the sciences. So, they had 4 different posters on the wall of ways to remember these 6 ideas of how the brain functions in learning, um, for example the brain remembers organized things. So, it's funny, the English teachers did a lot of words instead of pictures, they had 1 or 2 words. The social sciences had great stick figures, it was hysterical, I mean it was funny. And then the science people used science concepts, so for like the fact that it's organization and visual imagery they drew a cell and labeled it, so they all did something that connected to their own strengths and then as they	



<p>walked around and shared them some of them were going, oh I like that one, I'll remember that one. For building blocks, someone did construction building blocks, so everybody finds some way to help them remember something that will stick with them, so all of those things um it takes time to plan them and, it takes, first they have to buy in with the professors to agree that we need to do something differently and then we have to look at, you know, if you have a lecture hall with 200 or 300 students there is not a whole lot you can do with that many students other than partner, share pair, small groups, unless you assign group, or cooperative learning projects outside of class. So, some of the labs that go along I think those are really good when they have lecture and lab, at least they are getting the, that type of learning in the lab experience. So, maybe more lab components when they have the 2/300 students in a classroom, then they break off into smaller groups at another time and then do the application there in the field experience.</p>	
<p>Sophia: And then one more question that really did stick out in my head is the fact that you brought up the way you teach, you teach paperless, and I know this is a STEM environment and I know that technology is on the rise, I was just curious how do you feel about that and the fact that it's impacting this active learning concept?</p>	
<p>P1: Um, I think it can go together. I think technology can be incorporated into any active learning experience. I have students have their cell phones or their laptops out to look at things, somebody can be taking notes on it, um, you can have activities where at this table, I'm picturing one my student teacher did, um, she had the students they were looking at themes, I think, in a language arts class, high school level. And at one table she had them watch little short clips of movies, at another table she had a laptop and they were listening to music, oh no they were, um, evaluating. They were doing like critiques, so they critiqued the little short snippets of movies, then they critiqued music, then at the third table they were critiquing food, so she had different potato chips out, so technology can be a part of group activities as well whether they are recording</p>	

<p>or responding. There are a lot of great applications where you can do an activity or have a lecture with your students and then say okay go to this application and respond to this question and they go into their little corners and they record either audio or audio and video and they make little snippets and submit them to their teachers or share them with their peers. So you can take full advantage of technology in active learning. Technology is a tool, I always say, you don't have to have technology in every lesson. You use it when it's appropriate for what you are doing and there are lot of ways to incorporate it appropriately and it would be foolish not to because our students need the skills and they enjoy it so anytime you take out the phones, the clickers, the laptops at the lower grades they are all in because they are used to technology where if they are allowed to go look for definitions or images that go along with their images or whatever it is you can always incorporate it. And at the higher level this is the first generation that has had technology since birth, so we are now seeing, yes, most of, my children are 29 and 25 and they had a computer by the time they were 10, at home, and we were probably a little late. We were not as late on cell phones, they had cell phones already but we didn't have internet surfing, right, it was just texting. So, you think about the students that are here 20, say around 20, yes that's about right. So, this is the first group of college students that have had the internet, if, depending on where they lived, if they were rural they didn't, but in school and at home, they've uh, so they're used to technology, they like it, so why wouldn't you teach to something they are comfortable with? I think a lot of people think technology is, um, there are a lot of old teachers out there in the school systems, so it's, uh, I taught, it all came into effect as I was teaching so I saw all the change. So, now I think as this younger wave of teachers is coming through they have seen it since they were young so it will be even more inclusive. School districts are catching up.</p>	
Sophia: And that is all I have. Thank you.	
