Interactive classroom design using experimental tablet arm desks (201 Dey Hall)
Spring 2012 Pilot - Summary of Findings

August 2012

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BACKGROUND

UNC faculty members using instructional methods that promote active learning and student interaction are impacted by a number of classroom variables. The type of furniture and the ease with which it can be reconfigured during a standard class session are among the most important. Since the default configuration for most classrooms is to have all student seats facing the front of the room, furniture must be moved to promote direct eye contact during class discussions or interaction during small group activities.

The tablet arm chair (Figure 1) is the most common type of student furniture used in the University's classrooms. Most students must get out of a tablet arm chair in order to move it. While the act of moving a single piece of furniture is not particularly time-consuming on its own, it is likely to become more disruptive when faculty members want to move back and forth between lecture and interactive methods multiple times during a class period. Many instructors also report that moving furniture is noisy, both inside the classroom and in rooms located below the classroom.

In spring 2012, the Center for Faculty Excellence and the Department of Romance Languages and Literatures collaborated with furniture manufacturer Krueger International (KI) to pilot an experimental tablet arm chair called the Learn2™ (Figure 2) in 201 Dey Hall. The project was undertaken with the cooperation and support of Information Technology Services, the University Registrar, and the Classroom Policy Steering Committee.

Figure 1 – Traditional tablet arm chair

Figure 2 – Experimental tablet arm chair (KI Learn2™)

The tablet arm chair model represented in Figure 1 is very similar to the model used as the control for this study. The Learn2™ differs in several ways as outlined in Table 1.

	Traditional tablet chair	KI Learn2™
Foot type	Glide	Soft casters
Surface size	10” x 12”	13” x 21.5”
Accommodation of left hand students	2 left-hand chairs for every 12 chairs in the classroom	All chairs can be adjusted to support either right-hand or left-hand use
Distance of tablet from chair back (student mid-torso)	Fixed (13”)	Adjustable (14” to 17.5”)
Distance of tablet bottom to seat (student lower-torso)	8”	9.5”
On-chair storage options	None	Slanted racks
Seat swivel	None	28 degrees left and right from center

Table 1

Spring 2012 Pilot

During the Spring 2012 semester, four instructors teaching Spanish language and culture courses agreed to use the experimental furniture. Each instructor had taught her course at least three times previously, one as many as 17 times. Total enrollment across all four courses was 74, each at approximately 20 students. All the instructors completed a survey before the semester began on their preferred instructional methods. All reported making significant use of small group and discussion activities during typical class sessions when they had taught the course in the past.

All four courses were taught in the same room, 201 Dey Hall. Traditional tablet arm chairs were used during the first half (eight weeks) of the semester. During spring break, the traditional tablet arm chairs were replaced with the experimental Learn2™ chairs.

Students were asked to complete two surveys, one just before the experimental furniture was installed and a second one at the end of the semester. The survey questions focused on the ease with which the furniture can be moved, the ability of students to shift their orientation while they are seated, work space accommodation, and general comfort. Students were also asked open-ended questions about what they liked most and liked least about each chair. In order to provide an additional control for the study, 51 students enrolled in three Spanish courses taught in an adjacent classroom (Dey 208) also completed mid-term and end-of-semester surveys. The students taking courses in this classroom used traditional tablet arm chairs for the entire semester.

Focus groups were conducted in order to learn more about student and instructor attitudes about the new furniture. Eight students representing two of the intervention courses participated in two student focus groups. Joining the four participating faculty members in the instructor focus group were two additional Romance Languages faculty members who taught in the experimental classroom but did not administer pre- and post-intervention student surveys.

Finally, class sessions for three of the participating instructors were videotaped, before and after the experimental furniture was installed. The video was used to confirm findings that came out of the surveys and focus groups.

Student attitudes

The surveys were designed to provide a comparison between student experiences with the traditional and the experimental furniture. Differences in student attitudes were statistically significant on several points of comparison. The control group findings did not differ significantly from those of the post-intervention group.

Key survey findings:

Students reported it taking less time and effort[1] to move the experimental furniture into small groups. The chairs were also reported to be less noisy to move.

- 15% of students using the experimental furniture reported needing to stand up to move their desks, compared to 82.2% of students using the traditional tablet chairs.
- 6.1% of students using the experimental furniture reported it taking either a lot or some time to move their desks into small groups, compared to 57.5% of students using the traditional tablet chairs.
- 2.9% of students using the experimental furniture reported either a lot or some noise in the classroom when moving their desks into small groups, compared to 89.0% of students using the traditional tablet chairs.

Students reported the experimental furniture to be more flexible, allowing students to move around easily in them to see the teacher, the presentation/board, and to easily work and communicate with others during small group activities.

- 95.5% of students using the experimental furniture agreed/strongly agreed that the desk allowed them to easily work and communicate with others during small group activities, compared to only 43.8% of students using the traditional tablet chairs.
- 91.2% of students using the experimental furniture agreed/strongly agreed that that they could easily move around in their desks to see what was going on in the classroom, compared to only 37.0% of students using the traditional tablet chairs.

Students reported an increase in their ability to utilize their work space with the experimental furniture. There was an increase in their ability to access materials, position materials (textbooks and laptop), and write/type notes while working at their desks. The larger surface size of the Learn2™ was an important factor here.

- 88.2% of students using the experimental furniture reported it to be easy/very easy to position their materials (e.g., laptop, textbook, notepad) on the desktop for use when sitting/working at their desks, compared to only 16.4% (14.6% for additional control) of students using the traditional tablet arm chairs.

[1] Desks are on wheels which allow them to easily move without students having to stand up and move them.

Students reported an overall level of comfort with the experimental furniture.

- 97.1% of students using the experimental furniture agreed/strongly agreed that overall their desks were comfortable, compared to only 35.6% of students using the traditional tablet chairs.
- 93.9% of students using the experimental furniture reported that the size of the chair was "just right", compared to only 42.5% of students using the traditional tablet chairs. 57.5% of students using the traditional chairs reported that the chairs were "too small".

Comments from the student focus groups served to underscore many of the survey findings, and also identified some shortcomings of the furniture that can be used to inform future use of the chairs in 201 Dey Hall and classroom furniture acquisition decisions.

Students in the focus groups identified the following as the primary advantages of the Learn2™ over the traditional furniture:

- Greater mobility afforded by the wheels, facilitating group formation and interaction
- Ease of use and comfort advantages provided by the writing surface area and its adjustability.

Experimental furniture being used for small group work

Students making use of enhanced tablet space

The following student comments are representative of those collected:

"It is a lot easier [to do group activities]; you don't have to pick them up or push them and have that annoying sound it makes. I think my professor has more group activities now. When we worked in a group [traditional desks], we just would work with the people immediately next to us so we wouldn't have to move. Now because of the chairs, she'll pair us up, like across the classroom...then you can just roll your desk to them."

"Because the desk is wider and you can move it around. It is really a lot more convenient to arrange your stuff than it used to be, like you used to have to balance like your basic notebook and your folder and your pen and pencils and now you have the space and you can have out everything you need."

"I am too small, so I bring the desktop in closer to me."

"I have super long arms so I have this problem all of the time, with this desk, I have plenty of room."

The concern mentioned most frequently by students about the experimental furniture had to do with storage options

for book bags. The slanted racks beneath the Learn2™ designed for storing books were used by very few students. Most students relied on their book bags for removing and storing class texts and other materials. A few students said that the racks were too small for most of their textbooks.

The following student comments are representative:

> *"I had chairs like this at my high school; but they had an under bin storage, so I like always expected that there would be an under bin storage....I would put whatever materials we are not using in there....instead of on the ground."*

> *"I keep my books in my book bag and the things on the side are too small for my book bag."*

Faculty attitudes

Like the students, faculty members also appreciated how the experimental furniture facilitated the movement of chairs for small group work and the ability of students to personalize the desk as a learning space. Faculty members were also more likely to identify noise reduction as an advantage.

The following comments are representative of those collected during the instructor focus group:

> *"...what was nice for me is that they could get in their groups more efficiently and more quietly."*

> *"I like that they were quiet and you could move them around. I also found that you could configure my relationship with my students better. If I really wanted to ... I dragged their chairs close to me, just brought them close to me and said, "okay, we are going to talk". The whole gesture of bringing them together to me and putting them all really close together, so I could say what I wanted to say to them slowly and low was very effective, powerful....bringing them close as a team worked really well."*

> *"..and it was adjustable from left to right, but also they could bring it closer or not, depending on the size of the student."*

> *"I preferred the new furniture, because of the way I teach 105 [Spanish for High Beginners] and we need to do all kinds of activities and it was so much easier than the dragging [of] the chairs. There are classrooms underneath and you can always hear the ones above are always scraping the floors, you can hear that. These were not."*

Several faculty members noted that student backpacks placed next to chairs can impede instructor movement throughout the room. At times the backpacks also served as impediments to the movement of the Learn2™ chairs.

> *"Because the old ones, old desks didn't roll, the backpacks stayed closer to the desks, to the person who was using it. But, because these [the new chairs] roll, they would roll away from the backpack and the backpacks would be left in the middle of nowhere."*

It was suggested during the instructor focus group that encouraging students to hang their book bags on the back of the chairs may be an immediate option to help address this issue.

Next Steps

This report will be presented to the Classroom Policy Steering Committee (CPSC) during fall 2012. A number of issues require additional consideration before the KI Learn2™ or similar furniture can be installed in other classrooms. Among them are the price point compared to traditional models, the book bag storage issue raised during the pilot, and the amount of additional space, if any, that these chairs occupy. As with other recent interactive classroom designs piloted on campus, promoting student and instructor movement within the classroom generally requires a minimum amount of open space. The CPSC and campus organizations with classroom support roles will work to strike appropriate balance between classroom capacity and instructional best practices.

Furniture with similar design goals is being piloted in a classroom in the new Genome Sciences Building during the Fall 2012 semester. The CFE and ITS-Teaching and Learning will report back to the CPSC in the spring about instructor and student feedback on the furniture.

Questions?

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