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Successful at scale: 500 faculty, 39 classrooms, 6 years: A case study

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Despite trending investment in active learning infrastructure to support student learning, inclusion, and career preparedness, few universities have achieved the orchestration of campus stakeholders and pedagogical reform *at scale*. This article presents a process-oriented model for developing faculty and students for success in these evolving academic environments. Key features of the model developed include: holistic and strategic involvement of campus teams, rapid iteration of a portfolio of learning space types, and flexible, future-proofed spaces aligned with faculty preparedness. This approach can be translated to inform hyflex teaching and learning planning as institutions pivot to serve students in a post-pandemic world.

Introduction

Higher education is at a critical juncture in how we teach students and thus prepare the future workforce; the opportunities and challenges of our sector's collective response to the COVID-19 pandemic highlights more clearly that we must adjust our pedagogies to reach our students. While evidence has shown that student-centered, active learning practices are effective for all students (Freeman et al., 2014), the number of faculty who have adopted these practices remains small, especially in STEM fields (Stains et al., 2018). Reasons for this are complex, but many indicators point to an organizational culture that offers few rewards for innovative teaching and sends mixed messages in regard to the perceived value of faculty who invest time and resources in their teaching (van Lankveld et al., 2017). Furthermore, higher education institutions have recently been under fire for failing to prepare graduates to succeed in the rapidly changing workforce of the 21st century, citing specific gaps in recent graduates' ability to think critically, work in teams, solve problems, and communicate with diverse co-workers and audiences (NACE, 2018).

To address these challenges, several universities have invested in active learning classroom building projects that, when designed well, integrate faculty, students, and administrators in the common purpose of amplifying student learning and career preparedness. However, despite growing investment in active learning infrastructure, few universities have been able to achieve the orchestration of stakeholders and pedagogical reform at scale. As active learning classrooms become mainstream in the physical plans of universities, there is a growing need for models to develop large, diverse numbers of faculty and students for success in these evolving academic environments.

We offer our experience as a case study. At Auburn University, we grew from zero to almost 50 active learning classrooms in six years. At the same time, we rapidly scaled up the number of faculty ready to teach in active learning environments: between 2014 and 2018 the Biggio Center for the Enhancement of Teaching and Learning (Biggio Center) worked closely with over 500 faculty to support their course redesign for student-centered, active learning. This process, informed by change literature and guided by a team of diverse faculty, administrators, staff, and students has resulted in the creation of a robust and sustainable active learning ecosystem. In addition to sharing our process as a case study, we offer both a framework for rapid and nimble

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expansion of innovative learning environments and the supporting ecosystem for others to adapt to their own contexts.

Literature Review

Over the last 15 years, United States universities have seen a trend in not only replacing aging classroom facilities but transforming them for active collaborative learning. While collaboration and open class discussion have long been mainstays in upper level courses, especially in the humanities and social sciences, advances in instructional technologies and breakthroughs in cognitive science about improving learning have expanded student-centered learning activities to STEM fields and larger service courses (Bransford et.al, 2000; Carpenter et al., 2012; Brown et al, 2014). As a result, central classroom facilities are now designed with a greater focus on flexible furniture and technologies that enable collaboration between students, creating and sharing of complex content, and the practice of transferrable, professional skills employers seek (NACE, 2018). In addition to a growing number of classrooms, there is a growing body of research on their design and impact on learning.

Four trends characterize the focus of recent publications on these spaces: how to design a course with active learning as the driving force;[1] how to build active learning spaces;[2] how to use the building of new spaces to introduce innovation and change into higher education;[3] and how active learning improves student success.[4] Recently, Baepler et al. (2016) reminded us that many questions about scaling up active learning classrooms remain unanswered; for example, what are the longitudinal effects of learning in active learning environments? Is there a delta point where a student spends too much time in an active learning classroom, and the learning outcomes diminish? Is there an ideal point in a student's academic career for exposure to active learning environments?

Pioneers in the field like Beichner et al. (2007) and Brooks (2011) have shown that active learning has a significant impact on student success. Institutions such as the University of Minnesota, the University of Michigan, and the University of Iowa have made significant investments in active learning classroom buildings, thus paving the way to showing long-term effects on student learning as students are benefitting from multiple classes being taught in active learning spaces.

Our project builds on three well-known initiatives: SCALE-UP, TEAL, and TILE. Faculty at North Carolina State University developed the Student-Centered Active Learning Environment for Undergraduate Programs (SCALE-UP) in the mid-1990s to transform large enrollment classes (100 or more students) from "lecture-driven, one-way exchanges into fully interactive environments where professors and students spend time applying knowledge" (Ryals, 2011, para. 3). The classrooms were designed with the intent to facilitate a student-centered environment with interactions between teams of students. The defining design feature of these rooms is a 9-person pod with shared desktop technology (typically one laptop for every 3 students). There are more than 250 SCALE-UP classrooms in the United States and many others around the world (Scale-up, 2011).

The Massachusetts Institute of Technology (MIT) Technology Enabled Active Learning (TEAL) was developed by MIT faculty in the early 2000s to encourage student attendance and student engagement (MIT iCampus, 2020). TEAL classrooms' defining feature are twofold: both media-rich simulations and personal response systems are used to enhance student collaboration and learning.

Building on the SCALE-UP model, the University of Iowa implemented two new active learning classrooms in 2012. These classrooms – known as Transform, Interact, Learn, and Engage (TILE) classrooms – were designed to enhance collaborative, peer-to-peer, and active learning techniques (Van Horne et al. 2012). The University of Iowa started the TILE program in 2009 by focusing efforts on faculty development, classroom renovations, and education assessments (Van Horne et al. 2012). The defining features of the TILE classrooms are the circular tables which promote equity among students and de-centered facilitator podium that creates "a free-flowing learning environment where the lines between instructor and student are shared and blurred" (University of Iowa, 2020, para. 2).

At Auburn from 2011-2017, we built upon each of the preceding schools' prototypes to iterate Engaged, Active Student Learning (EASL) classrooms. Similar to the TILE project, we prototyped classrooms, implemented a process to train faculty to maximize learning in the classrooms, hired student workers who support the faculty and technology in the classrooms, and forged relationships with the Registrar and academic leadership to ensure that only EASL-ready faculty have access to the classrooms. In addition, we revised the student evaluation of teaching questions, provided one-time funds for re-designing existing classrooms to be more "EASL-like", and conducted a pre-mortem with all stakeholders prior to the opening of our active learning classroom building, the Mell Classroom Building @ RBD Library (hereafter referred to as Mell).

[1] See especially Davidson, Major, Michaelson 2014.

[2] see especially Beichner 2014, but also Oblinger 2006 as the seminal text.

[3] see, for example, Van Horne et al., 2012.

[4] see Baepler, Walker 2014, or Freeman et al. 2014.

Our case study highlights key inflection points in our process and timeline from 2011 to 2017. Echoing what Foote et al. (2016) discussed, Auburn University gave "faculty and administrators a reason to change" (p. 19), created space and opportunities for innovation both through bottom-up and top-down implementations, and made this change sustainable by valuing active learning.

Foundations of Scale: Developing Our Faculty

The Mell project began in 2011 when a forty-person committee of AU faculty and administrators assembled under the direction of the Associate Provost to plan a new classroom building in response to a 2009 needs assessment of classroom spaces on campus. The committee, led by the Associate Provost, included representation from the Registrar, faculty senate, student government association, large-lecture faculty, deans, department chairs, IT specialists, facilities, librarians, and accessibility specialists. They identified a mission of "sustainable, adaptable, and aesthetically pleasing." Members conducted site visits of active learning classrooms at NC State, Georgia Tech, and MIT, discussed and made decisions about the building and the potential locations on campus, and chose the architecture firm. Once the site was chosen, the committee downsized to an executive group including the director of the Biggio Center, the associate dean of the Library, and faculty. While the larger plan was developed, another working group formed to prototype an active learning classroom in an existing building. This group consisted of the IT manager of the College of Liberal Arts, a university architect, and an interior designer from facilities; it was supported by faculty, students, IT and facilities staff members, and the Biggio Center. When the first room opened, faculty who taught in this room were those who had made a strong case for active learning and had participated in a precursor of the course (re)design workshop, later the primary vehicle of large-scale faculty development at Auburn.

Involving educational developers early on in the movement toward sustainable, scalable change at Auburn was key to ensuring that the new building would be filled with faculty who were prepared to maximize its resources. As Little & Green (2012) argue, educational developers, by virtue of their "'hybrid' academic identities" have surprising opportunities "to navigate institutional power dynamics" (p. 203). The Biggio Center recruited and developed faculty from every college on campus and most departments within the colleges.

Diversifying the faculty who were prepared to teach effectively in Mell's EASL classrooms was a key goal to ensure a range of disciplines, teaching experiences, and comfort-levels with technology were represented as opposed to the default crowd of early adopters. The Biggio Center started working with faculty for EASL-readiness long before ground was broken on the building. Using a diversified approach that included summer course redesigns, fall and spring semester workshop series, an online course, and retreats, faculty had numerous opportunities to redesign a course for EASL classrooms. Each of the interactions used an active learning methodology to introduce the concept of backward design (Fink, 2003). All of the face-to-face interactions took place in the prototype EASL rooms so that faculty gained experience with active learning pedagogy from the student perspective, while also learning about the pedagogy. Digital badges were used to incentivize participation, gather data on the impact of the development on faculty practice, and certify development in active learning pedagogy for the Mell classroom scheduler.

Unlike other academic spaces that are primarily housed in and controlled by different colleges, we created centrally shared and controlled active learning environments. The rooms are scheduled by a small team involved in faculty development and the Registrar's office to ensure that faculty who have had significant support in redesigning their courses for active learning are provided with priority access to teach in Mell, incentivizing faculty to participate in workshops and rethink their courses towards active learning, thus creating additional buy-in.

In addition to developing diverse faculty, the Biggio Center also works with deans, department heads, and college chairs to secure buy-in from leadership and ensure faculty feel safe and free to experiment with new teaching modalities in the active learning classrooms. The Biggio Center secured significant funding from the Provost to incentivize participation in the Summer Course (Re)Design program with stipends. Not only did this ensure faculty could invest time to think through the challenges and opportunities of teaching in active learning spaces, it sent the message that upper administration values evidence-based scholarly teaching--a message that is not always supported with resources at a research-intensive university.

Although buy-in from upper administrators fueled change at the faculty level, the actual decisions about how the classrooms would be designed and who would have access to them were made by interdisciplinary collaborative teams composed of experts on the critical design decision-points: teaching and learning, technology, interior design, classroom-scheduling, facilities management and operations. The value of this approach is not only that diverse teams make better decisions, (Huston, 2016) but that we avoided a single point of failure model by democratizing administration of the learning spaces. This, perhaps more than anything else, characterizes our process and speaks to

the sustainability of the institutional change we have initiated.

By involving constituencies early and often, we were able to scale up the number of classrooms and faculty prepared to teach in them simultaneously. The combination of collaborative design and faculty development opportunities focused on designing for active learning led to 82% of faculty scheduled to teach in Mell being EASL-ready. Faculty from ten of Auburn's eleven colleges and schools teach in the building. Student resistance to active learning, which can be a major barrier to successful adoption of new teaching practices by faculty (Smith, 2015), is decreasing as more and more students are exposed to it in courses across disciplines. The first term saw over 6,000 students taking classes in the building, and that number has grown to over 8,000 students as of the building's fifth term (Fall 2019). Finally, the diversity of faculty who are using EASL classrooms to engage students in their learning and the growing number of students experiencing this pedagogy are changing the culture of teaching and learning at Auburn, as about 200 faculty from 36 departments are currently teaching in EASL spaces each semester which constitutes about half of the academic departments on campus.

Auburn University's Change Process

To be effective within the university context, we realized that we needed to move quickly through a modified prototyping process in order to get feedback on success and failures, and then adjust and move forward in order to scale classroom design and buildability quickly. After we had built two classrooms in this manner, our team realized that they had modified the Design Thinking Framework. Design Thinking, an iterative design process consisting of five steps, (Empathize, Define, Ideate, Prototype, and Test), is usually used for developing small objects (e.g. web app, robots in hotels that bring you towels, Aldi bag buying), not classrooms or buildings (Plattner, 2010; Plattner, Meinel, & Weinberg, 2009). Since we were not developing small objects or a process that could be rapidly and economically prototyped, discarded, and prototyped again, we retroactively modified and condensed the Design Thinking framework into four steps: Collect, Scan, Prototype, and Assess. (Figure 1).

The difference is that in Design Thinking you sit down with a large quantity of people to learn what their experiences are in order to understand the problem you are trying to solve. You listen, empathize, define the problem carefully, and receive feedback from your stakeholders in an iterative process that takes you through the stage of having ideas towards a prototype that is tested – and then the whole process may start over. Such a process takes time.

At Auburn University, we *collected* ideas from our stakeholders – in particular, students and faculty, but also IT specialists working with classroom technology, facilities and library staff, and the Office of Accessibility. We *scanned* the landscape by looking at other buildings on campus and at other schools; we pulled the best ideas according to what we wanted to achieve with the building. Once the first *prototype* space was built, we collected *assessment* feedback from the primary users – faculty and students - which informed the next space design. Because we also worked with faculty on rethinking their teaching and learning methods, the assessment of the space functionality was not limited to smaller details (e.g., the monitors are too high), but also shifted into more holistic outcomes such as informal learning space design, how to achieve student-centered teaching in spaces not at all designed for this approach, or interdisciplinary idea exchanges.

The short timeline (for academic changes) of building one room and starting to use it while beginning to build the next

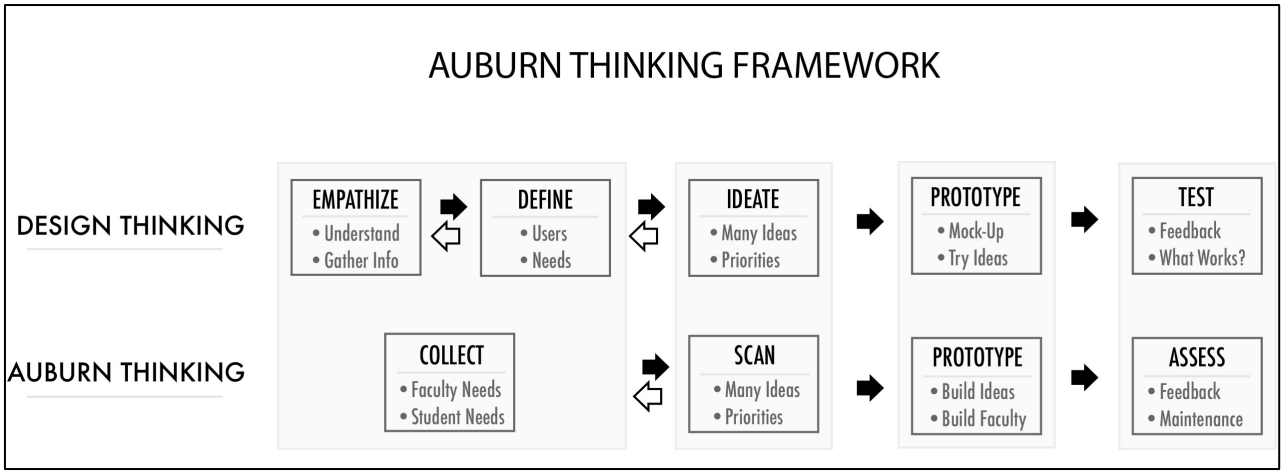

Figure 1. Auburn Thinking Framework

room gave us efficient ways to shift in our design from one iteration to the next, with such basic realizations that flexible furniture, erasable surfaces, and one projection system were the primary needs of the majority of the classes we were designing for, while a smaller number of power users benefitted from the additional technology of having one monitor per student table. This realization led to more empowered faculty and students, better cost efficiency, and a way to design the classroom building towards the future. The three prototype classrooms that were designed, constructed, and mined for feedback prior to breaking ground for the new classroom building, informed the design of what would become the Mell Classroom Building.

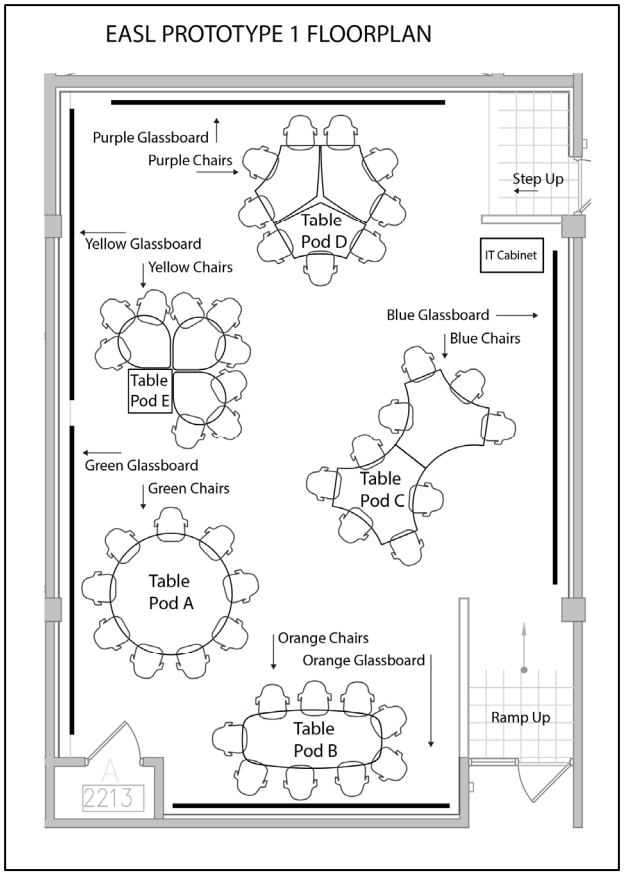

Figure 2. EASL Prototype 1 Floorplan

EASL Prototype 1: Table Shapes, Color, Technology

We began by renovating an undesirable classroom in Auburn University's main classroom building. By implementing multiple types of table shapes that each supported nine students (45 seats), we tested whether the large, circular tables implemented in the SCALE-UP, TEAL, and TILE models were indeed the most effective (Figures 2 and 3). We invested heavily in writable surfaces in the form of multiple colors of glass boards to encourage instructors and students to collaborate and engage in the classroom. The glass boards further helped to organize the classroom into definitive groups – also called pods. The classroom technology tested an early version of wireless connectivity of mobile devices to multiple LED monitors in the room, with each monitor serving one table, for a total of 5. It is worth noting that we received enthusiastic feedback about the use of color in this room.

Figure 3. EASL Prototype 1 Photo

EASL Prototype 2: Increased Seat Numbers and Touch Screen Monitors

In the follow-up prototypical classroom implemented in a STEM classroom building (72 seats), a single table shape that supported six students was utilized—a hexagonal shape comprised of two trapezoidal tables (Figures 4 and 5). This choice was a result of observations, feedback received from students on the EASL Prototype 1 table shapes, and the requirements from faculty planning to teach in this second space. Glass board was again installed along the perimeter of the classroom to promote visual engagement with class material. Students commented that seeing other groups' work on the glass boards challenged them to step up their efforts and the thought that they were putting into their own work; faculty agreed, stating that the design, complexity, and depth of the EASL students' work increased. A different technology for sharing mobile devices wirelessly, large LED touch-screen monitors, was implemented at each table (12 total plus 1 instructor unit), but the glass board was by far the most utilized.

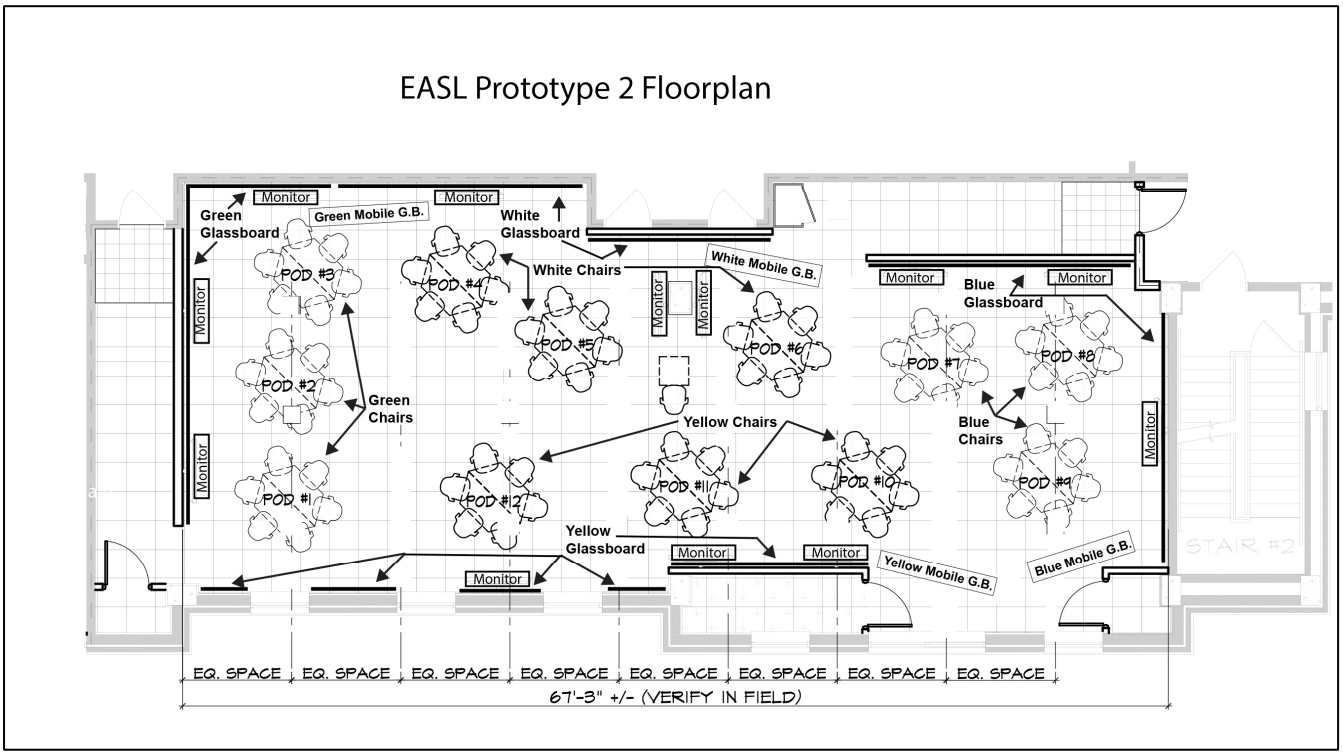

Figure 4. EASL Prototype 2 Floorplan

EASL Prototype 3: Less Technology and Greater Flexibility = EASL Lite

Insights from the first two classrooms led to yet another prototype, the EASL Lite classroom (48 seats) (Figure 6), an active learning classroom that greatly reduced the amount of digital technology implemented, and rather focused on collaborative furniture and glass boards. The two LED monitors that anchored both sides of the classroom could still be used for mobile device connection.

Figure 5. EASL Prototype 2 Photo

Figure 6. EASL Lite Photo

Figure 7: Design details table			
Description	**Haley 2213 (Fall 2013)**	**Science Center 118 (Fall 2014)**	**Haley 3184 & 3194 (Fall 2015)**
Capacity	45 seats	72 seats	One 36 seats classroom or Two 18 seat classroom
Configuration	5 tables with 9 seats each	12 tables with 6 seats each	6 tables with 6 seats each
Displays	• Glass boards • Color-coordinated chairs • BYOD wireless connectivity for a monitor @ each table • Barco Clickshare	• Glass boards • Color-coordinated chairs • BYOD wireless connectivity for a monitor @ each table • Christie Brio	• Glass boards • Wireless connectivity for two 80" monitors @ fronts of room • Apple TV
Display Control	@ Teaching station (AMX)	@ Teaching station (AMX)	@ Teaching station (Extron)
Other Features	• Power and 1 HDMI connection @ each table • Raised floor for power, network in floor • Carpet and modules to improve flexibility in room layout	• Power and 1 HDMI connection @ each table • Raised floor for power, network in floor • Carpet and modules to improve flexibility in room layout	• No power or other connections at tables • Carpet • Operable wall to divide room

Central Classroom Building as Hub of Academic Excellence

Each prototype provided valuable lessons; the team learned what worked for Auburn University, what needed to be improved, and what needed to remain (Figure 7). This process of prototyping directly informed the design of the Mell Classroom Building, which incorporated four main types of spaces: EASL classrooms, active learning lecture halls, breakout/study rooms, and informal learning spaces.

The Mell Classroom Building opened in August 2017 with 69,000 square feet of learning spaces. It consists of four types of spaces (26 EASL classrooms, 2 active learning lecture halls, 40 study/breakout rooms, and informal learning spaces, adding up to 2,000 seats) embedded in a modern building that attaches to the front of the existing library. Natural light and windows create visual connections that inspire people to use the spaces more creatively and promotes learning community, while the open spaces of the building and their informal collaborative nature make it easier for faculty across disciplines to connect and share learning experiences.

EASL Classrooms

The active learning classrooms were designed to be flexible, with trapezoidal tables that could be oriented in multiple ways, for example s 6-person hexagonal pods or in rows. Colorful glass boards line the perimeter of the classrooms. EASL Lite classrooms (Figure 8), have projection screens on one wall while the EASL classroom (Figure 9) have monitors mounted behind the glass board so that students at each pod can connect their devices in order to collaborate. Mobile device sharing technology is implemented in both classroom types. Both sets of spaces are designed for the future, with built-in recesses for easy addition of monitors to turn EASL Lite spaces into EASL spaces, and projection screen cases as well as projection infrastructure if the need to increase the number of EASL Lite spaces arises.

Active Learning Lecture Halls

The active learning lecture halls (166 seats each) are designed so that students can interact with each other (see Figure 10). Four tiers of seating with two fixed rows of tables per tier allow for collaboration as students in the front row can turn around on their free-standing, rolling chairs to work across the table with their peers in the deeper back row. Mobile device sharing technology is also implemented in the lecture halls; glass boards are installed on some walls, and writing on the glass windows is encouraged.

Study/Breakout Rooms

Small, technology-rich collaboration rooms allow students and faculty to collaborate, meet in small groups, and conduct just-in-time office hours. Each breakout room contains writable surfaces, a monitor with mobile device sharing technology, and a table and chairs designed to facilitate collaborative work. (Figure 11). These rooms are distributed

throughout the building in convenient proximity to classrooms and informal learning spaces.

Figure 8: EASL Lite at Mell Photo

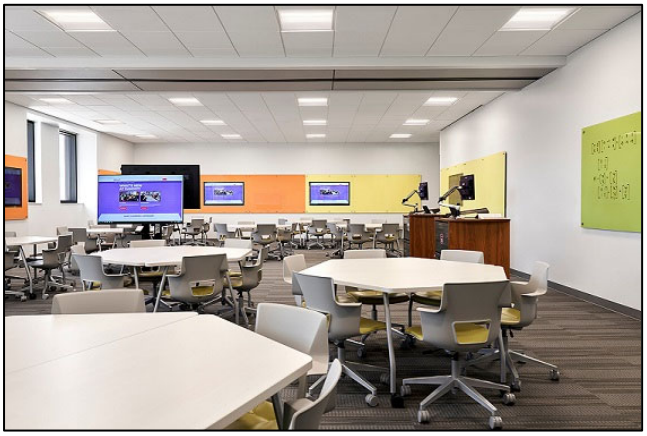

Figure 9: EASL Classroom at Mell Photo

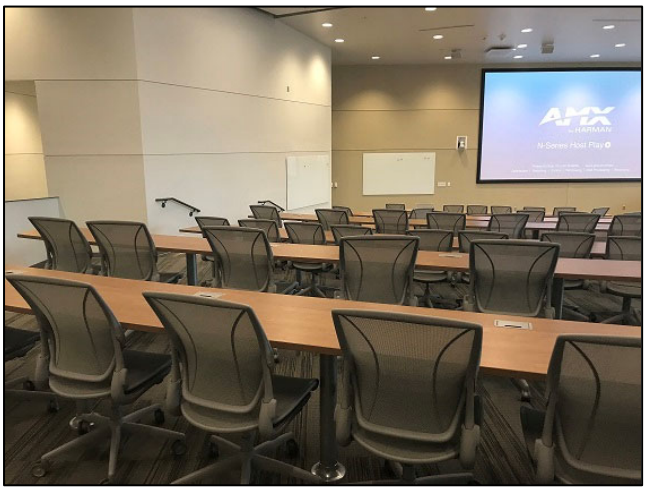

Figure 10: Active Learning Lecture Hall at Mell Photo

Figure 11: Study/Breakout Rooms at Mell Photo

Figure 12: Informal Learning Spaces at Mell Photo

Informal Learning Spaces

Informal learning spaces are located throughout the building; they include café tables near food service locations, quiet study areas, collaborative lounge areas, and standing-height group tables (Figure 12). They provide destination space for students to study, meet up, and hang out. Because Mell was built onto the front of the existing library, requiring the renovation of a significant portion of the interior of the library into EASL and informal learning spaces, the new spaces benefit from the library's existing resources including technology check-out services, learning commons, media labs, food service, and the library itself.

By prototyping both types of EASL classrooms and involving the interdisciplinary team at all stages, the four types of learning spaces implemented into Mell created an agile menu of spaces that formed an active learning ecosystem. To ensure long-term agility, the team planned for future needs. For example, the team chose to balance current technology needs by implementing more EASL Lite classrooms that had the ability to convert into EASL spaces as faculty became more comfortable with utilizing active learning teaching strategies.

The variety of disciplines and range of students, from first year to graduate-level, ensures that the spaces and resources are used efficiently. Where one faculty might use the wireless mobile device sharing technology and monitors, another might rely more heavily on the writable surfaces. Some faculty never move the tables while others have students reconfigure the layout of the classroom daily. Thus, another benefit to a centralized classroom building dedicated to EASL pedagogy as opposed to a distributed model is that the diversity of its uses is visible to all. This, in turn, promotes the resiliency of the ecosystem as faculty who might feel isolated trying a new pedagogy in their home departments are able to identify as part of a greater whole when they come to teach in the Mell building. The culture of active learning is vibrant and visible thanks to the design of the building. The discipline-based diversity of faculty and students further sustains the culture and protects it from outside threats.

How Campus Life Has Changed

During the two years since the Mell Classroom Building opened its doors it has become a staple of campus tours for both new students and faculty. As faculty recruitment becomes more and more competitive, Mell's presence on campus is making a big impact on faculty recruitment at the on-campus interview stage.

Students and faculty come to the building even if they do not have classes located there. Students in the building frequently comment on how they wish they had classes in this building, and faculty bring their classes for active learning opportunities outside the classroom, including photography, student musical ensemble performances, construction tours in Building Science courses, and project work in digital humanities. Teaching faculty are empowered to experiment with such concepts as escape rooms (Engineering), Reacting to the Past games (History, English), or deeper and more complex project-based learning. New faculty orientation occurs in Mell, and several conferences have sought out Mell as a host location. The building is a 24-hour learning destination, and students use the vacant classrooms as study rooms in addition to utilizing the study/breakout rooms. Mell has truly become a hub of academic excellence.

Auburn University is committed to continuing building new and renovating existing learning spaces with active learning principles in mind; Mell has changed the way in which all colleges and units on campus now design their academic spaces. Because of how the faculty were empowered to rethink their courses, the gains are not limited to the walls of Mell. Recently, both the Samuel Ginn College of Engineering and the Raymond J. Harbert College of Business opened new buildings in the style of Mell that include active learning spaces of different sizes and for different functions; in particular, Business focused on graduate student education and case study rooms, while Engineering not only designed EASL classrooms, but also expanded its makerspaces. A culinary science center is also planning on including active learning spaces that will support active and hands-on instructional cooking, prepping, and wine and beer creation spaces (construction began January 2020). Finally, the university has broken ground for a second general classroom building that will include wet lab spaces and an additional 189,000 square feet of general classroom space, with a completion date of Fall 2022. In addition, Auburn University is looking carefully at its more than 300 existing classroom spaces across the university to determine what small changes will make teaching and learning in these spaces more engaged and thus beneficial to the students.

Conclusion: Lessons Learned

As we hope we have shown in our case study, we prototyped spaces, gathered feedback from the full range of campus partners (not just the architect and interior designer), and iterated the design at the next level to respond to needs and to continue to inspire growth. Finally, we share here the three most important takeaways from our experience.

1) Build the faculty while building the space.

Building from what pioneers in the field had done, we scaled up faculty development before the building opened. The Biggio Center, in partnership with other units, created robust programming with multiple avenues of participation for faculty to become and stay comfortable with teaching and learning in EASL spaces. Through EASL "refresher" workshops at the beginning of each term focusing on active learning strategies and the classroom technology, the self-guided online EASL Academy, consultations and other feedback opportunities, our teaching and learning center remains deeply involved in the ongoing implementation of the building. This investment is leading to more innovative teaching and learning, which in turn is catalyzing institution-wide innovation and culture change. A responsive support system in the building itself is also a necessity for faculty and students to remain comfortable using the spaces effectively. In Auburn's case, a group of undergraduate students are the face of support in the building, helping faculty with technology issues, checking the spaces on a daily basis, and ensuring that everyone feels welcome and supported.

2) Get buy-in from diverse stakeholders and involve them early and often in design decisions.

Every college and university is different; we suggest that others considering such moves prototype and get buy-in and feedback from multiple stakeholders at their institution, not just from the design team. Simply reading case studies and mimicking exactly what works on other campuses could lead to failure if you do not address the unique situational factors of your institution, faculty, and students. Prototyping a classroom and gaining multi-faceted support across campus is also necessary for faculty and staff buy-in and culture change; however, involving stakeholders in the design does not mean taking following suggestion or request. We learned quickly that design ideas can be limited by experiences, and often what was asked for was not actually used. For example, we learned that monitors should be at eye level, and while the wish for touch screens seemed reasonable, we learned that most faculty did not use this technology – so we shifted from monitors being installed above the glassboards to installing them at eye level with overlaid glass board to create a quasi-writable monitor surface.

3) Use intentionally minimalistic designs and pared-down technology to future-proof the spaces

Embedded in the iterative process is the necessary acknowledgment that learning spaces at scale must invite future learning, and technology need not be the primary focus of the design. We deliberately reduced the amount of technology in some rooms (fewer or no monitors for instance) in favor of the design that faculty would be most comfortable with (writable surfaces, moveable furniture) and that would build in students the transferrable core skills (communication, teamwork, leadership, risk-taking) we hope will distinguish Auburn graduates in the next decade.

A final takeaway which is not unique to our endeavor but bears repeating —build off the successes of others. Look at what other institutions are doing well and adapt it to your specific institutional contexts. Most importantly, recognize the wealth of knowledge your own campus has ***already cultivated*** for taking on large scale projects, and be savvy about when to expand and when to contract the decision-making and operational logistics teams. When you keep a student-centered focus, intentionally invite multiple, diverse colleagues to the table to inform the process, and then pare back when it is time to execute unleashing projects "at scale" becomes a workable enterprise. As higher education institutions, now more than ever, we need to believe we can be nimble so we may remain viable.

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