Faculty Training as a Tool to Support Active Learning Classroom Usage

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FACULTY TRAINING AS A TOOL 
TO SUPPORT ACTIVE LEARNING CLASSROOM USAGE

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In memoriam of Prof. Laurent Richard
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ABSTRACT

The study examines how a training workshop on teaching in a recently introduced active learning classroom at Nazarbayev University (Kazakhstan) helps faculty participants integrate active learning and shift their teaching to an active learning classroom. A case study approach was employed, with data collected through surveys, interviews, and embedded research. Out of 20 training participants, eight consented their participation in this study with four cases demonstrating their commitment to active learning. In particular, two study participants started redesign of their courses with active learning and shifted teaching to an active learning classroom, one case started to develop an active learning training program for Kazakh language teachers, and one case showed interest in planning course redesign with active learning. For each case, activity systems analysis was used to explore the individual activities.

During the training sessions, participants discussed the ways the active learning classroom could support their teaching and enrich learning experiences. As a results, four perceived barriers for active learning implementation were identified: time and workload, student participation, instructional design concerns, and concerns about university support. In general, the faculty members considered the training workshop helpful in reconsidering their teaching practices. These findings add to the body of research on active learning classrooms and faculty training, focusing on how teacher innovativeness can be supported by the university administration.
CHAPTER 1
INTRODUCTION AND LITERATURE REVIEW

Statement of Problem

With all the learning opportunities available today, higher education institutions are challenged to demonstrate their relevance and value to their learners. Because most physical learning spaces are designed to support teacher-centered types of pedagogies with minimum in-class interactions (Jamieson et al., 2000), “transformation of educational spaces” (Penrod, 2021) through the creation of effective educational environments (Daniels, 2016) is seen as one of the ways to make the offer more attractive.

Various researchers have studied the impact of physical learning spaces on teaching and learning in higher education (e.g., Fraser, 2014; Keppell, 2014; Oblinger & Lippincott, 2006). In particular, universities develop new infrastructures to address changing educational trends and societal needs (Lombardi et al., 2021;), such as building facilities that encourage active, student-centered learning experiences (Steel & Andrews, 2012). The design of such learning spaces is influenced by three major trends: accommodate active learning principles, focus on human-centeredness, and make technology accessible (Brown & Long, 2006). These features constitute active learning classrooms.

Active learning classrooms are defined as the physical learning spaces that facilitate, support, and promote active learning pedagogies (Lam et al., 2019; Talbert & Mor-Avi, 2019). Active learning is a learner-centered approach that involves students directly in the learning process, with instructors serving as guides. Active learning spaces support social constructivist pedagogies to encourage group activities and usually have features like flexible furniture and accessible technology that can be used by students as well as instructors to fit various learning activities. Tools that are present in active learning classrooms may include digital projectors, wall-mounted or/and personal whiteboards, or classroom response systems. In addition, there is no clearly stated “front” of the room (Park & Choi, 2014), which allows the focal point or center of the room to vary, in contrast to classrooms designed for lectures which have a designated “front” where an instructor should stand with student seats all facing in that direction.
The research body demonstrating how active learning classrooms influence learning outcomes is growing, acknowledging that learning spaces matter. Among the most researched types of active learning classrooms in the higher education context are Student-Centered Active Learning Environment with Upside-down Pedagogy (SCALE-UP); Technology-Enabled Active Learning (TEAL); and Transform–Interact–Learn–Engage (TILE). In various reports, active learning spaces are referred to as “future learning spaces” (Enyal & Gil, 2020), integrated to “innovative learning environments” or “modern learning environments” (OECD, 2013), include Nexus Learning hubs (Ashley et al., 2015), learning studios (Wanless, 2016) and collaboration studios (Donkin & Kynn, 2021).

According to EDUCAUSE report (Alexander et al., 2019), 73% of universities are either planning or implementing active learning classrooms. In the 2019 Higher Education’s Trend Watch & Top 10 Strategic Technologies Report, active learning classrooms were identified as the second top strategic technology with a projection to become mainstream by 2022 (Brooks & McCormack, 2019). The COVID-19 pandemic may have slowed the pace of development for active learning classrooms, however these spaces continue to be developed.

The infrastructure development and institutional plans alone do not lead to successful implementation at the classroom level. For example, a university can invest in modernized learning spaces, but this will not guarantee improved learning experiences. For the learning infrastructure to be effective, there is a need in an appropriate faculty preparation (Birdwell & Uttamchandani, 2019). This case study reports on how faculty training was used to help faculty reconceptualize their instructional practices in preparation for teaching in an active learning classroom.

**Supporting Literature**

In an attempt to synthesize research that addresses the relationship between the faculty professional development and integration of active learning pedagogies into the instruction, this literature review is limited to reviewing research on active learning classrooms and faculty professional development programs, and what effect the latter have on alterations in teaching practices.

This review was conducted through a systematic search of the online libraries and databases such as ERIC, PsycINFO, JSTOR, ProQuest, and Google Scholar. In addition to these
databases, I conducted a specific search of the educational journals like Educational Technology Research and Development, International Journal of Higher Education, Active learning in Higher Education, TechTrends. Keywords and terms included (“active learning”), (“active learning classrooms”), (“teacher/faculty professional development”), (“educational development” and “higher education”), (“training” and “teacher/faculty perceptions”). There were no search period limits in this review. In addition, to gain more of the context about professional development for faculty to teach in active learning spaces, I examined available sources of the associations and development networks around the world such as POD Network (The Professional and Organizational Development Network in Higher Education), ATEE (Association for Teacher Education in Europe), HEPA (Higher Education Planning in Asia Association), as well as the websites of the universities involved in active learning spaces building and development.

**Active Learning Classrooms**

The history of active learning classrooms is summarized by Beichner (2014). He describes how lectures and labs were supported with hands-on activities first in the lecture halls. Later, active learning was integrated into lecturing with the help of technology (e.g., response systems like clickers), necessitating proper spatial layouts with first studios and, finally, active learning classrooms. In this regard, the first two studies conducted around active learning classrooms can be highlighted: one by Beichner et al. (2006; 2011) at North Carolina State University (NCSU), another by Dori & Belcher (2005) at Massachusetts Institute of Technology (MIT). Beichner introduced SCALE-UP where students were grouped for social interactions in teams and each sat at round tables with a personal whiteboard. The lecture in such classrooms was minimal and normally the class time would be split between various 10-minute activities after which detailed reports would be written by students.

Dori and Belcher (2005) introduced the TEAL project. In a TEAL class, information is provided via mini lectures. Between those mini lectures, students are engaged in hands-on experiments, visualizations, problem solving, and peer discussions. This classroom was designed to enhance conceptual understanding of electromagnetism phenomena and facilitate group interactions through technology-enabled methods. Unlike SCALE-UP, TEAL focuses specifically on incorporating visualizations in the learning process.
Several researchers have found active learning classrooms to be advantageous for teaching and learning. For example, Rands and Gansemer-Topf (2017) conducted a case study analyzing student and faculty perspectives in a newly redesigned active learning space to examine the behavioral factors of classroom engagement. They found out that the physical design of the active learning classroom created a community of learners, helped students cope with challenging tasks, and "helped students to learn holistically" (p. 29). Similarly, instructors in the study of Ashley et al. (2015) highlighted the opportunities for peer-level coaching, interaction, and increased engagement as new gains when teaching in Nexus Learning Hubs. Copridge, Uttamchandani & Birdwell (2021) found that teaching in active learning classrooms allowed faculty more visibility and presence, "better student feedback and apprenticeship" (p. 218) and provided opportunities for students to build communities for learning.

Several studies examined the effectiveness of particular instructional strategies in active learning spaces. Brooks (2010) analyzed classroom activities, content delivery modes, instructor and student behavior in two classroom types - a traditional classroom and an active learning classroom. Using the developed classroom observation instrument, the researcher reveals that particular activities and behaviors might be correlated with specific spaces, and active learning techniques used in active learning spaces "are superior to lecture-based instruction in traditional classrooms" (p. 7). Lasry et al. (2014) found the combination of student-centered pedagogy and a student-centered space as the most effective one.

More studies find relationships between active learning classrooms and adaptations or modifications in teaching practices. For example, Imms & Byers (2016) established a positive relationship between student-centric classroom design and changes in teaching and learning (p. 16). Also, Baepler et al. (2016) stated that active learning classrooms support flipped and blended learning.

Despite all the advancements in designing and redesigning learning spaces, there is not much evidence of the parallel growth of the instructors' capacities to use these spaces effectively (Imms & Byers, 2016). In particular, there is a criticism about the insufficiency of proof that active learning classrooms successfully impact teaching practices (Hall-van den Elsen & Palaskas, 2014). In this regard, researchers call for more studies about the effectiveness of instructional innovations in learning spaces rather than merely describing positive faculty perceptions of new furniture and technologies (Odum, Meaney, & Knudson, 2020).
Another major issue is faculty resistance to integrating active learning practices in their teaching (EDUCAUSE, 2019; Miller & Metz, 2014). Several factors are perceived by instructors as barriers to implementing active learning. A lack of knowledge about active learning pedagogies is one of these factors (Niemi, 2002).

**Active Learning Pedagogies**

Active learning can be defined as collaborative, cooperative, problem-based (Maudsley, 1999; Prince, 2004; Savery, 2006) learning that involves learners in classroom activities (Chi, 2009). This is an instructional methodology that necessitates learners' active participation. As active learning pedagogies belong to constructivist learning theory (Hood Cattaneo, 2017), they represent a paradigm shift from lecture-based instruction to interactive classes with student-centered activities (see, e.g., Lumpkin et al., 2015; Worley, 2008).

Empirical research supports active learning pedagogy as an effective instructional approach. In particular, studies reveal positive effect on learner motivation (Norman & Schmidt, 1992); knowledge retention (Michael, 2006); increased confidence with instructional material (Townsend et al., 1998); support of various learning needs (Nilson, 2010); embracing diverse student population (Haak et al., 2011); increased student retention (Hovelynck, 2003); stress reduction (Jensen, 2005); better memorization (Cherney, 2008); and enhancement of high-quality learning through cognitive and emotional engagement (Hailkari et al., 2021). Showing the students the value of their presence in the classroom (Williams & O'Dowd, 2021), these strategies may also develop transformative learning (Mezirow, 2010). Besides, active learning is reported to help build essential skills among the graduates, thus increasing their employability opportunities (Law & Baer, 2020; Snyder, 2003).

Even though numerous studies have demonstrated the positive impact of active learning on teaching and learning, teachers are not always prepared to successfully integrate active learning methods (Miller and Metz, 2014) and fail to explain expectations to the students who presume that they will have more work when in an active learning environment (Deslauriers et al., 2019). Various factors impede instructional changes overall and the introduction of active learning in particular. Among the barriers to successful adoption or integration of active learning are faculty's negative attitudes towards these instructional methods due to lack or absence of
institutional support in providing them with professional development (Moravec et al., 2010; Niemi, 2002).

**Faculty Professional Development**

Amundsen & Wilson (2012) describe professional development in education as "actions… undertaken by faculty members or by others working with faculty, aimed at enhancing teaching" (p. 90). From an administration perspective, professional development is an important aspect to supporting instructors as it provides an opportunity to increase performance expectancy and build learning culture. Such professional development events can be either required or optional for instructors, but their provision shows the level of organizational culture support.

Faculty professional development interventions in higher education aim at supporting academics in making informed decisions about their teaching practices and can be in form of programs or courses, portfolio preparation, mentoring (Gast et al., 2017), a training model (Hoban, 2002), and others. These interventions can support the exploration of new topics for the classroom, increase student learning and engagement (Barlow et al., 2014; Owston et al., 2008), impact faculty learning (Owston et al., 2008), and encourage a more student-centered approach to teaching (Stes et al., 2010; Viskupic et al., 2019). Researchers say that to enable faculty to adapt to new teaching and learning environments, it is important to identify the opportunities that such spaces provide to promote more active, collaborative, student-centered activities (Steel & Andrews, 2012). This is important as teachers are challenged to "re-imagine their teaching" (p. 243) when teaching in such spaces. Even if universities are building more student-centered learning spaces, "there is less emphasis on how teachers are helped to reconceptualize their learning designs for these spaces" (p. 248).

Considerable amount of research has been conducted to reveal the factors contributing to successful faculty development programs. These include offering strategies to support faculty ability to adapt in new teaching and learning contexts with opportunities to reflect on their practice (Hooker, 2008; Steel & Andrews, 2012); presenting information about available infrastructure and technological innovations through the consideration of university's strategy and culture (Jonas-Dwyer & Pospisil, 2004); providing relevancy, value and engagement (Diaz et al., 2009); mentorship and networking opportunities (Law et al., 2014; Lumpkin, 2011).
The university context plays a vital role in researching how particular professional development events lead to instructional changes. Although each institution faces their own challenges, the call for transformations in teaching pedagogies in higher education is universal. The research indicates that faculty support needs contextualization to help instructors empower their teaching by reflecting and reshaping their practices and beliefs (Baran et al., 2011; Redstone & Luo, 2021). The common need is to develop an effective contextualized faculty development program tailored to the specific concerns of that institution, in particular when introducing a novel campus facility. For this literature review, faculty professional development on active learning or/and teaching in an active learning classroom were considered.

Faculty members who participate in professional development programs are more likely to effectively incorporate active learning strategies into their lectures (Mantzourani et al., 2019). Viskupic et al. (2019) demonstrated that geoscience instructors who attended the professional development began to teach student-centered classes more often than those who did not participate in training (33% and 13%, respectively). At the same time, if faculty have not received adequate training before teaching in an active learning classroom, there is no impact on student learning (Andrews et al., 2011).

Although acknowledged by researchers, policymakers, and educators, the importance of faculty professional development has not always resulted in successfully addressing teacher needs (Borko, 2004; Yamagata-Lynch & Haudenschild, 2009) or changing current teaching practices (Guskey, 2002). Moreover, a few research studies assess instructional improvement initiatives after completing faculty professional development programs (Kucsera & Svinicki, 2010).

**Analytic Framework**

For this case study, the exploration of the process of adapting participants’ instructional materials to teach in an active learning classroom is built upon Engeström’s theory of expansive learning and Activity Systems Analysis (ASA, Engeström, 1987).

**Expansive Learning Theory**

The theory of expansive learning was developed within the framework of cultural-historical activity theory originated by Vygotsky in the 1920-1930 and then expanded by Leont’ev (as cited by Engeström, 2015). According to Engeström (2015), the evolution of
cultural-historical activity theory can be examined through three generations. The first generation introduced the mediation and was presented by Vygotsky as a triangle with the subject, object and mediating artifact. Second generation was presented by Leont’ev and appeared as a response to the limits around the unit of analysis which remained individually focused. The main focus was on the idea of internal contradictions being the driving force. Finally, a move towards networks of activities resulted in the appearance of the third generation of activity theory that strives to understand multiperspectiveness.

The theory of expansive learning focuses on learning communities, culture creation and transformation, movement in the zone of proximal development, and formation of theoretical concepts always relying "on its own metaphor: expansion" (Engeström & Sannino, 2010, p. 2). In case of success, the redesigned human activity can be expanded in the particular work environment. Engeström (2015) offers a seven-steps cycle of such a redesign to be applied to this study: 1) questioning (an examination of current teaching practices through the lens of potential teaching in an active learning classroom); 2) analysis (an exploration of the appropriateness of learning activities if conducted in an active learning classroom); 3) modelling (an examination of the training materials to apply for active learning implement and teaching in an active learning classroom); 4) examination (participants design their new learning activities, discuss and reflect upon their potentials and risks); 5) implementation (practical application of active learning strategies and/or teaching in an active learning classroom); 6) process reflection (participants evaluate redesigned activities and identify work for improvement); 7) consolidation of a new form of practice (the results of the study are communicated to campus community with the call for active learning integration).

**Activity Systems Analysis (ASA).** Activity systems analysis (ASA) is a qualitative research tool that helps understand a human activity in a real world learning environment normally within a collective endeavor. Through ASA, a researcher can explore how different elements of the activity context (preparing for teaching in an active learning space) work together or create tensions.

Developed by Engeström, this methodology helps bridge practice and research, and can be used in multiple ways, although the best way might be taking “a systematic approach for engaging” in ASA (Yamagaga-Lynch, 2010, p. 62).
According to Yamagata-Lynch (2014), there are seven reasons why ASA is beneficial when examining human activity in complex environments. ASA helps to: 1) analyze human activities; 2) identify systemic issues; 3) examine systemic contradictions that lead to tensions; 4) find solutions for these tensions; 5) investigate relationships between activities; 6) evaluate the effectiveness of provided solutions; and 7) collaboratively problem-solve and communicate (p.130).

This case study uses training as a formative intervention (Engeström, 2011) to explore learning activities of the training participants and whether expansive learning during university training and follow-up consultations help produce new forms of work activity (Engeström, 2001).

The important part of selected analytic framework is constituted by contradictions. Originally introduced by Leont’ev (1978), contradictions are seen as potential change agents in activity systems. According to Engeström (2015), there are four levels of contradictions that can be detected in the Activity systems analysis: primary, secondary, tertiary, and quaternary.

At the primary level, contradictions occur "when one of the elements contradicts itself" (Marken, 2006, p. 33). For example, when planning to integrate active learning into their courses, one teacher needs to determine which active learning technique or strategy works best while also not requiring too many efforts both from teacher’s and students’ parts. Also, participants are presented a new facility which they might or might not be ready to use depending of the barriers to be overcome.

At the secondary level, contradictions occur "when one element of the activity conflicts with another element of the activity" (p. 33). For instance, teacher’s concern with the active learning classroom as a tool prevents its usage.

At the third level, contradictions occur due to evolutions of the elements of the activity. For example, teacher could resist the demand from university administration to implement active learning techniques to be able to teach in an active learning classroom.

At the fourth level, contradictions occur "between activity systems and neighboring activity systems" (p. 34). For instance, teacher could resist suggestions from a training workshop facilitator that they should review their lesson designs to be able to integrate active learning and shift teaching to an active learning classroom. Also, although not evident due to the study
duration, students’ reactions to implemented active learning or active learning classroom itself can be of high resistance.

The ASA will identify inner contradictions in the course redesign process, which can be used to improve future iterations of the training program and identify other supports teachers might need when preparing to teach in the active learning classroom. It will also help me identify what training participants perceive as barriers in active learning adoption, what tools and policies facilitate active learning adoption, and whether the instructional intervention would help in addressing these conflicts. Prior to analyzing data with an ASA framework, a thematic analysis of the collected data will be conducted.

**Purpose and Context of the Study**

The purpose of this case study is to identify how training helps university faculty prepare to implement active learning strategies when teaching in an active learning classroom. The study's context is the researcher’s workplace and is a problem of practice. A traditional lecture hall at Nazarbayev University (Kazakhstan) has been transformed into an active learning classroom. Now that the transformation is complete, faculty members need to prepare to teach using that space. The university administration has invested in the conversion of the space, and now wishes to ensure that the space is used effectively, with the new furniture, technology, and layout used to support active learning practices. A training workshop has been recommended as a means of faculty preparation. This study focuses on the experience of faculty who attend the training and their perceived preparation for using the new classroom. The study will help illuminate the changes that faculty need to make and the barriers or challenges that they perceive. If effective, the training can serve as a model for preparing faculty to teach in active learning spaces at other universities in the country and region.

**About the University**

Nazarbayev University (NU) was established in 2010 to become a "national brand" as a global-level research university. To achieve this highly aspirational goal, NU has committed to fulfilling five mandates: (1) execute higher education reform leadership, (2) demonstrate academic excellence, (3) research excellence, (4) become a model for creating healthcare services, and (5) implement innovation and translation of research into production.
This is a traditional campus-based university focusing on both teaching and research. The university has a population of 6000 students and 500 academics. NU has seven schools, including undergraduate schools for Social Science and Humanities; Engineering and Digital Sciences; and Medicine (all three also offer graduate programs); and graduate schools for Public Policy; Business, and Education. The newest addition was the School of Mining and Geosciences, inaugurated in 2017.

Two significant documents reflect NU’s commitments in teaching and learning: NU Strategy (2018-2030) and Teaching and Learning Strategy. In both, a shift towards student-centeredness is one of the priorities. This study examines the introduction of an active learning classroom and faculty preparation attempt to use the renovated physical learning space effectively.

**Active Learning at NU.** Introduced to the campus community in 2016, library active learning spaces were mostly used for training and workshops. In 2021, for the first time, an existing traditional lecture hall with fixed seating at the School of Mining and Geosciences (SMG) was redesigned into an active learning classroom. Some of the new features include of this room:

1. Modular tables and mobile chairs to enable flexible use of space for various types of group activities were introduced.
2. Three PolyVision whiteboards that allow students to make presentations and hold discussions when necessary.
3. Multiple power sockets around the room to promote a bring your own device approach.

A tiered floor was eliminated, allowing for both – teacher-focused and student-centered layouts. The walls were decorated with vibrant color stripes to incentivize learning (Taylor, 2009). The refitting and upgrading work of Classroom #6.105 is illustrated in Figure 1.

**Professional Development Training for Active Learning.** The primary task was to design and deliver a professional development event to familiarize faculty with a new facility and prepare them to integrate new instructional practices as they complete the training workshop. At NU, faculty continuous professional development is realized mainly in collaboration with school partners and the Higher Education Academy in the UK (renamed "Advance HE" in 2018).
There was no training at NU dedicated to faculty preparation for using existing active learning classrooms.

Figure 1
Classroom 6.105 (left) before transformation and (right) after

This training workshop was primarily focused on helping faculty learn how to adapt their pedagogy in the active learning environment so they could take full advantage of the new classroom space. As the Innovative Learning Officer at NU whose duties include the organization of faculty training events and consultation on classroom redesign, I aimed to examine how the faculty training supports their readiness to integrate active learning techniques when preparing for teaching in redesigned classrooms. Additionally, I planned to learn about the barriers faced by faculty when redesigning their classes. This study contributes to understanding how faculty professional development supports alterations in teaching practices and broadening active learning spaces research to include a more diverse range of academic disciplines, classroom types and different geographical locations.

Research Questions

The research questions addressed in this study align directly with the purpose of the study. Three research questions are:

1. What barriers do faculty face when they plan to shift from teaching in a traditional classroom to an active learning classroom?
2. How does training on active learning help faculty reconceptualize their courses?
3. How do faculty plan to use the active learning classroom following their participation in an active learning training?

**Significance of the Study**

This study explores how faculty members approach course redesign when shifting to teaching in an active learning classroom and the role that training plays in that shift. In this instance, the course redesign process is externally driven. In other words, the university built the space to fulfill an institutional initiative, not at the request of faculty. Faculty are being asked to change in response to this initiative. Although there are other case studies that examine active learning classrooms usage (e.g., Beichner et al., 2008; Copridge et al., 2021; Park & Choi, 2014) and professional development aimed at supporting instructors when transitioning from traditional learning spaces to innovative learning spaces (e.g., Desimone, 2009; Odum et al., 2020; Viskupic et al., 2019), this study occupies a unique position in that it represents a case from a country not extensively represented on the innovative learning spaces map, and can serve as an example for institutions in other countries in the Central Asian region.

Nazarbayev University's key stakeholders who will benefit from this study include faculty, students, and administration. NU faculty will be prepared to use an active learning classroom. Additionally, trying a new facility might increase their self-efficacy resulting in changes in their instructional practices. Although not involved in this study, students will benefit as their instructors will be equipped with new and engaging strategies. With the evidence-based data on the efficacy of new space usage, the university's administration will justify further campus transformations. In particular, the feedback from the participants about the classroom will inform administrators about the technology and space needs for teaching and learning at our university. Lastly, within the sharing experience mandate prescribed to NU, the training package can later be shared with other universities in the country. Sharing experience mandate suggests that all operations of NU are shared as experience with the country’s higher education system. For this, the university is actively cooperating with Kazakhstan’s Ministry of Education and Science and regularly holds specialized trainings, workshops, webinars, and courses for the country’s universities. Informing other higher education institutions in the country of the importance and potential of active learning will reinforce the necessity of a student-centered shift.
Summary

This chapter stated the problem, described the background and significance of the study, and provided the research questions. In addition, a connection between the problem of this study and existing literature was established to provide with the existing best practices of delivering professional development in redesigned physical learning spaces. The reviewed studies inform of the relationship of theory and practical application of active learning pedagogies used in higher education with the physical learning spaces. Based on the findings, for a successful introduction of new teaching techniques, including active learning, teachers need to be equipped with decent knowledge and tools. Professional development programs must seek to understand the barriers from the institutional level as well as the faculty level, that can support successful implementation.

Building and developing active learning classrooms require significant investments. Improving facilities can lead to substantial changes in teachers' perceptions of the new teaching techniques, including active learning. However, it is crucial to identify the role physical learning space plays in supporting a shift towards active learning instruction and having leadership and stakeholders' buy-in. Various researchers call for more teacher development opportunities to introduce active learning techniques. This call also urges administrative support in providing resources and time for faculty heavily accompanied by decent professional development opportunities.
CHAPTER 2

METHOD

This study explores how faculty members approach the course redesign when shifting from a traditional learning space to an active learning classroom. The study is situated in the context of a training workshop to prepare faculty for effective usage of a newly designed active learning classroom, which requires them to adopt active learning into their course design.

Research Design

Considered as one of the most frequently used research methodologies in the field of educational research, the case study method was applied to frame the investigation of the effectiveness of a campus faculty training program aimed at supporting faculty in exploring active learning classrooms and integrating active learning into their courses. A literature review helped define the approaches to the case study method serving as a justification for the choice of the case study for this research inquiry. Importantly, a case study research design suggests a detailed description and analysis of a case in its local context inviting various types of data to be collected. In particular, a case study method is applied when a researcher seeks to understand a particular case (Stake, 1995, as cited in Denzin & Lincoln, 2018); answer “how” and “why” questions within a contemporary phenomenon within a real-life context (Yin, 2009); examine a particular project in real-life context to generate understanding of a project to inform professional practice (Simons, 2009).

This study examines instructors' changing practices after completing “Teaching in an Active Learning Classroom” training workshop. The training serves as a tool to focus the faculty on the redesign task and provide them with an orientation to the new classroom and ideas about active learning pedagogy. Qualitative research methods including interviews, surveys, artifact analysis were employed to explore participant experiences and document change processes. The rest of the chapter details the study’s methodology. It provides a description of the training workshop, the site and sample population, outlines the data collection methods, describes the instruments, explains the rationale behind the methodological design, and confirms the validity,
Overview of the Campus Professional Development Program

The campus professional development program in this study was developed in response to introducing a new active learning classroom. The program's purpose was to train faculty on ways to implement active learning instructional strategies in their courses and get ready to teach in an active learning classroom.

The faculty training workshop's design, content, and delivery were based on a) the findings from the literature review and frameworks for higher education teaching and b) desk research about active learning classroom courses offered by various organizations and institutions.

The training workshop was designed with a primary focus on pedagogy rather than technical training in active learning classrooms. Emphasis was placed on supporting their shift from teacher-centered model to learner-centered paradigm to improve learning experiences. Whereas exposing training participants to the possibilities of an active learning classroom served as an encouragement to reflect on the possibilities of changing their teaching practices.

The design of the training program in this research study was guided by the Adult Learning Strategies proposed by Lawler and King for effective faculty development (2000). This model has four stages: preplanning, planning, delivery, and follow-up, and is grounded in five Adult Learning Strategies: 1) “developing a climate of respect”, 2) “utilizing collaborative modes of inquiry”, 3) “building on participant experience”, 4) “learning for action”, and 5) “cultivating a participative environment” (Lawler & King, 2000, p. 2). The first strategy highlights the importance of establishing a welcoming and inclusive environment for every faculty despite their backgrounds and teaching styles. During the training workshop, all participants could share their opinions and solicit feedback from their peers during the paired discussions and conversations in groups. The second strategy calls for opportunities for collaboration. During the training program, participants were occasionally invited to reflect on their beliefs about teaching and learning, share experiences from their teaching, peer consult each other on their practices. The third strategy is about integrating activities based on the needs of the training participants.
A pre-survey was distributed with the questions specifically asking about participants’ experiences to spot the needs and concerns. The fourth strategy recommends incorporating action plans. Faculty engage in professional development to get the knowledge applicable to their practices. Therefore, the training workshop included learning experiences for academics to design and develop activities that could be used in their courses. The fifth strategy emphasizes encouragement to share teaching experiences, which was completed during a third training session of microteaching. All three cohorts of participants incorporated the varied experiences of faculty participants, including postdocs, teaching fellows, instructors, assistant professors, associate professors, and professors (Lawler & King, 2000).

In addition, I used the training workshop as an opportunity to showcase all available instructional technology at NU. When the pandemic began, various teaching technologies were purchased by the university. However, they were not necessarily used effectively by our instructors. Therefore, tools like Nearpod and Padlet were used to deliver training materials. The training session provided instructors with a model of integrating these tools into a lesson.

The content of the training workshop was informed mostly by desk research. The training has been designed based on various active learning resources shared, among others, by the University of Michigan Center for Research on Learning and Teaching (University of Michigan, n/d) and Duke Learning Innovation (Duke University, 2019). I drew my primary inspiration from a two-session workshop on active learning provided by our strategic partner, Steelcase, in 2020. Next, I sought information about online courses offering training programs about active learning and active learning classrooms. The analysis of module descriptions and learning outcomes from these courses allowed me to define the content of this training workshop. Seeing research evidence that instructors are more likely to try to develop new practices when "in conditions similar to those in which they learned" (Viskupic et al., 2019), I designed my training workshop as a class with the activities and assignments in the form of active learning. Almost all activities were developed to engage learners in group collaboration. Following Knowles's Theory of Adult Learning (Knowles et al., 2005), I embedded opportunities for self-regulated learning (e.g., Participant handbook), encouraged learners to bring in prior experience (e.g., discussion prompts), and made the learning objectives clear. Additionally, I implemented various active learning strategies, including think-pair-share (Lyman, 1981), concept mapping (Novak &
Cañas, 2006), jigsaw (Browne, 2017), ranking task (Hudgins et al., 2006), as well as strategies to increase participants' engagement (Williams & O'Dowd, 2021).

The training was designed as a three 1.5-hour sessions program delivered in an online synchronous format across a one-week period. Training information and instructions were distributed to the participants via an e-learning handbook and through email reminders about upcoming sessions. Table 1 presents the learning outcomes for the training sessions.

Table 1.

Learning Outcomes of Three Training Workshop Sessions

<table>
<thead>
<tr>
<th>Session #</th>
<th>By the end of the session, participants will be able to:</th>
</tr>
</thead>
</table>
| Day 1     | 1. Develop and articulate a good knowledge and understanding of active learning.  
               2. Differentiate between active learning strategies and techniques.  
               3. Identify benefits and barriers of/to active learning pedagogy. |
| Day 2     | 1. Define active learning classroom.  
               2. Demonstrate the ability to apply active learning strategies and techniques for the purposes of implementing needed improvements in lesson/course.  
| Day 3     | 1. Identify ways to scaffold learning in an ALC.  
               2. Outline steps for (re)designing course/lesson units. |

This training was designed to accommodate instructors with various experience levels, including those with no experience or history with active learning and more experienced instructors who are eager to integrate new strategies into their courses. The training employed active learning techniques to facilitate the exploration of affordances of the active learning classroom and strategies the participants might use when teaching in that space. The researcher delivered training and moderated group activities. At the end of each session, all materials were made available to participants and were sent via email.

The training workshop was delivered in September 2021, with the aim to prepare faculty for possible usage of an active learning classroom in Spring 2022 semester.

Site and Participants. There were three cohorts of training participants. The first cohort was comprised of School of Mining and Geosciences faculty members. A traditional lecture hall was redesigned into an active learning classroom in their building. The training was intended to
prepare them for the first anticipated use of the classroom in Spring 2022. The second and third
cohorts comprised faculty members from other schools at Nazarbayev University.

All training attendees were invited to participate in the study. Recruitment occurred before
the first session and throughout the overall training workshop. All faculty enrolled in the training
received an email asking them to complete a pre-survey and request their participation in the
research study. Faculty members who consented to participate were asked to complete the pre-
survey, allow their activities during the training sessions to be used as data, and complete a post-
survey. Out of 20 training attendees, eight consented to participate in the study. They were two
professors, three associate professors, two assistant professors, and one postdoc.

Additionally, four participants agreed to be interviewed. The interviews were conducted
with each participant individually as shown in Table 2 (used pseudonyms).

Table 2.
List of Interviews

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Interview number</th>
<th>Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Akylbek Munay</td>
<td>September 30, 2021</td>
<td>1</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Prof. Omar Detroit</td>
<td>October 5, 2021</td>
<td>1</td>
<td>Zoom</td>
</tr>
<tr>
<td>Prof. Stefano Fiori</td>
<td>October 6, 2021</td>
<td>1</td>
<td>Zoom</td>
</tr>
<tr>
<td>Prof. Kulzaida Bigaliyeva</td>
<td>November 3, 2021</td>
<td>1</td>
<td>Zoom</td>
</tr>
</tbody>
</table>

Data Collection Instruments

Institutional Review Board (IRB) approval was obtained from Florida State University
before data collection began on August 18, 2021. To triangulate the data sources, data were
collected through surveys, interviews, and documents produced during the training workshop.

Surveys. An online pre-survey through Qualtrics was used to collect data about
participants’ beliefs about active learning and whether they use active learning strategies in their
teaching. Participants were asked to rate their level of agreement on a 5-point scale (strongly agree
to strongly disagree) on their beliefs about student-centered teaching, overall, and active learning,
in particular. They were asked to indicate instructional methods and assessment types, as well as
their intention to learn more about active learning.

An online post-survey through Qualtrics includes two parts. The first part asks participants
to provide feedback to training and its activities. The second part asks participants to indicate the
extent to which their knowledge about active learning has expanded. Also, questions ask them to
rate on a 5-point scale the level of their readiness to make changes to their courses incorporating active learning.

**Interviews.** Interviews help researchers understand a phenomenon from the participants’ perspectives (Merriam, 2009). For this research study, one-on-one semi-structured interviews were conducted with four faculty participants in individual formats from September 30, 2021, until November 8, 2021. The interview questions were aligned with all the research questions and addressed four main areas, namely: actual implementation of active learning, perceived usefulness, intention to use, and attitudes and concerns towards teaching in an active learning classroom. At the beginning of each interview, participants were informed that they might feel encouraged to expand on topics of a particular interest to them in addition to answering the interview questions. The semi-structured interviewing allowed me to obtain additional data from the participants to better answer the research questions. All interviews were conducted via Zoom due to pandemic restrictions. These interviews lasted around one hour each.

**Embedded Research.** As a member of staff in an organization where study took place, I was able to employ embedded research when co-producing knowledge with the training participants. Data collected during the training uses the embedded research approach, with data gathered while participants engage in regular learning activities (Dennen & Rutledge, 2018). In this approach, opportunities for data collection are embedded directly into regularly planned educational activities. This approach allows for unobtrusive data collection in authentic settings, with participants articulating salient points about the research phenomenon while simultaneously engaged in learning. Activities embedded within the training, such as discussions and jamboards, provided opportunities for eliciting information about participants' current beliefs, practices and perceived challenges related to active learning.

**Data Analysis**

Data analysis took place during and after the data collection phase. For the survey responses analysis, no specific software was used apart from the reports and data analysis instruments embedded in the Qualtrics.

**Thematic analysis.** Data received from the interviews, training artifacts, and open-ended questions from both surveys was coded and analyzed thematically. Using this method, the barriers that participants perceive and experience (research question 1), the role training plays in the
The four participants that agreed to be interviewed were analyzed as individual cases for which individual activity systems analysis was constructed. The components of ASA were used to code participants' activities. For each activity model, the activity elements were identified. These are: a subject (a study participant engaged in activity), an object (a motive of activity), tools (instruments or artifacts to support activity), a community (a group of people a subject forms part of while engaging in activity), rules (any guidelines that lead to either activity constraint or activity justification), division of labor (who is expected to do what). Also, the tensions were identified through each participant’s activity model.

**Maintaining Trustworthiness.** The following strategies were employed to enhance the credibility of this case study research: a) bracketing, b) triangulation, c) transferability, and d) dependability. According to Tufford and Newman (2012), bracketing is a process “whereby the researcher draws awareness to presuppositions regarding the topic” (p. 88). For this research study, several bracketing methods were used throughout the whole research such as reflexive journaling and memoing. The participants reflections during training can serve as a bracketing tool before the interview stage to avoid erroneous assumptions. Another strategy to increase research validity is triangulation. According to Patton (2015), triangulation helps increase the credibility of the research. In this study, triangulation can be guaranteed through the use both of multiple methods of data collection and multiple sources of data. To achieve triangulation, three methods of data collection were used: surveys, training participation materials (including documents, reflections and discussions), and interviews. In addition, the data collected during the interviewing process were compared to the transcripts from the training sessions. Therefore, triangulation was also guaranteed through the comparison of data sources. For data source triangulation, each participant was considered as a unique data source. Transferability is another strategy to increase research validity which can be achieved through the description of this study's research methods and materials, including data collection and analysis. The case should serve as a ready-to-use model of introduction of active learning classrooms and faculty preparation on campuses. Another strategy to increase the internal validity of the research findings involved dependability. The documentation of the research data is supported with various mechanisms, including audio recordings, chat recordings, and materials produced by the training participants.
It should be mentioned that although I have conducted various faculty development events, I have never taught a course in an active learning classroom. Given my active learning training design and delivery work, I might be inclined to spot only positive views of active learning classroom and pedagogies. All the critiques that study participants shared about the active learning classroom, the training, and their intentions regarding the course redesign were noted and are discussed in the next chapter.

Summary

Introducing new facilities on campus should be supported by the teacher preparation to familiarize them with the novelties. Although teacher preparation does influence teacher practice, without continual professional support, its effects may weaken (Liu & Phelps, 2020; Martell, 2020). Also, it might be challenging to ensure that all study participants can introduce changes in their instruction. The incapacity of teacher professional development programs in supporting changes in teaching practices can be explained by various factors. For instance, Bonwell and Eison (1991) denote insufficient training, time commitment, and incentives as the three most commonly cited challenges. In addition, the physical layout is considered a barrier due to physical distractions (Petersen & Gorman, 2014). This can be solved if and when the active learning strategies are incorporated gradually during the redesign process (e.g., Miller & Metz, 2014; Peterson & Gorman, 2014). This can be initiated and supported through faculty engagement in professional development opportunities. Therefore, it is important to assist faculty in developing tools to support active learning integration to teach in active learning classrooms (Copridge et al., 2021).

This study presents the framework to support the student-centered paradigm shift by redesigning learning spaces and teacher preparation. Even though the study is context-specific, its findings will contribute to introducing active learning pedagogies in the wider higher education space.
CHAPTER 3

RESULTS

The purpose of this study was to examine to what extent training on teaching in an active learning classroom helped faculty members reconceptualize their teaching practices to accommodate active learning in their teaching. The study used a case study design to identify the barriers when planning to teach in an active learning classroom, the perceived effectiveness of training to support the course redesign with active learning, and faculty plans to teach in an active learning classroom.

The findings are aligned with the three research questions and are presented in two parts. First, in this chapter, the three research questions are answered with the pre- and post-surveys data and the conversations during training sessions. Second, in the next chapter, the findings generated from the four cases on active learning integration are presented.

Training Recruitment

It was initially planned to recruit participants from one discipline, but the training was made available more widely upon request. In the end, having faculty members from various disciplines participating in the same training program was advantageous (Akerlind, 2005). After announcing the training opportunity on a university-wide basis, 20 faculty attended the training. Out of this group, eight agreed to participate in this study, which entailed consenting to include their pre- and post-surveys in the data set. Additionally, out of eight participants, four agreed to be interviewed. Their participation led to the cases presented in Chapter 4. Study participants were of various teaching ranges from postdocs to full professors representing various schools of an examined institution.

Pre-Survey

Participants were invited to complete a pre-survey consisting of 12 questions before the training. Two questions from this survey (items 2 and 3) helped define pre-training knowledge and usage of active learning. For example, findings from the pre-survey item 2, “How much do you know about active learning?” showed that five participants out of eight knew “a little” about
active learning. And findings from a pre-survey item 3, “Do you currently use active learning to teach your course(s)?”, revealed that five participants chose “probably yes”, two participants chose “might or might not”, and one participant “did not use” (N=8).

**Barriers to Teach in an Active Learning Classroom**

Research question 1 asked, “What barriers do faculty face when they plan to shift from teaching in a traditional classroom to an active learning classroom?” This research question was directly addressed in the pre-survey. Participants were presented with six potential barriers (time, knowledge, resource constraints, student resistance, classroom management issues, and unfamiliar technology concerns) and asked to indicate which barriers they faced. To answer this question, participants could select all of the barriers that applied to them, meaning that they could select more than one barrier. Of the suggested barriers, the most frequently cited were not having time to plan it (four selections), concerns about the students' participation, and a requirement to use unfamiliar technology (three selections each). Please refer to the Table 3 below.

**Table 3.**

*Barriers Inhibiting Ability to Use Active Learning*

<table>
<thead>
<tr>
<th>Barriers Inhibiting Ability to Use Active Learning</th>
<th>Participants</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t have time to plan it</td>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td>Don’t know how to do it</td>
<td>1</td>
<td>12.5%</td>
</tr>
<tr>
<td>Don’t have the resources to do it</td>
<td>2</td>
<td>25%</td>
</tr>
<tr>
<td>Students won’t participate</td>
<td>3</td>
<td>37.5%</td>
</tr>
<tr>
<td>Loss of classroom control</td>
<td>2</td>
<td>25%</td>
</tr>
<tr>
<td>Requires use of unfamiliar technology</td>
<td>3</td>
<td>37.5%</td>
</tr>
</tbody>
</table>

During the training sessions, participants confirmed their concerns around time and student participation. Additional barriers were raised such as instructional design concerns, and university support issues.
Barrier 1: Time and Workload

Although participants acknowledged the benefits of teaching in an active learning classroom, they highlighted that such instructional changes would necessitate extra time to prepare their classes. Time was an issue because participants recognized that the shift from teaching in a traditional classroom to an active learning classroom could increase their workload. Instructors reported that their schools had a shortage of faculty numbers leading to “a lot of work to do” (“Main concern is time to do all this. You need to have lectures, and organizing all these activities will take an incredible amount of time. At least, at the beginning”). When envisioning when the work of course planning could be done, one instructor commented:

But the only time I might be able to organize myself would be a holiday, but I am on vacation. And unfortunately, this is also the only time I can do research. So it is not possible.

Participants confirmed time and workload to be a barrier hindering active learning implementation. As explained by participants, course design or redesign requires specially allocated time and/or workload decrease for the period of active learning integration.

Barrier 2: Student Participation

Even when they recognized the importance of active learning for the learning experience, training participants were apprehensive about how their students would react. Some commented about students’ unwillingness to commit more to a class. For example, as noted by one participant:

Students do not read before class. Even for lab work, I assign reading a one-page handbook, and even that they do not read. Out of 70 students only five would read this. And others would come and ask what they are supposed to do. You always have to explain. I doubt I will be able to apply this especially in large classes.

At the same time, several participants expressed their worry about students’ workload and well-being. Some of the comments that exemplify these concerns include:

From the instructor’s side it can all be great, but students can be stressed.

Looks like for one class with so many activities, students might feel overwhelmed. Last semester I used various tools and platforms, but for students, it was a little bit stressful, as
they had to get acquainted with so many tools for various activities. We need to check with students if they are comfortable with the teaching methods.

Essentially, instructors recognized that active learning would be new for students, too, and that students would have to participate in order for it to be successful.

**Barrier 3: Instructional Design Concerns**

In conversations with instructors, they recognized that in order to get students more involved, they would have to be better prepared for each class themselves. One instructor commented:

You need to give students structure, and maybe moving around the classroom will not help undergraduate students to learn the fundamentals of disciplines.

This barrier is intertwined with the previous two barriers. Instructors need the time to engage in instructional design, which would allow them to design new lessons that would provide sufficient structure and guidance for active learning. With adequate lesson plans, students would be more likely to participate as hoped.

**Barrier 4: Concern about University Support**

While training participants embraced the importance of course redesign with active learning, they expressed various concerns about implementing a new teaching practice and the availability of support from the university’s administration. Many instructors said they would need the administration to be more flexible towards the faculty members shifting from teaching in a normal classroom to an active learning classroom. Specifically, they would need support in the form of appropriate resources, time, and additional help. Support was considered a provision with more resources or facilities and a mechanism to handle or approve the failures and risks associated with implementing active learning and shifting the teaching to an active learning environment. For example, several participants asked about how they should address failure in an active learning environment:

What is the view of NU administration towards the AL? is it compatible with the syllabus? If we change our practices from traditional lecturing to active learning, will it be welcomed by the heads?
Comments such as this one demonstrate the importance of leadership in setting the tone for faculty expectations and providing conditions that allow faculty members to make changes.

**Reconceptualizing Courses**

Research question 2 asked “How does training on active learning help faculty reconceptualize their courses?” To answer this question, responses from both a pre- and post-survey as well as data collected during training activities were used. Pre-survey items helped identify pre-training teaching and course design beliefs, while training activities and post-survey items helped identify any shifts or reconceptualization in teaching.

**Current Teaching Practices**

The second learning outcome for the Day 2 session was: “By the end of the session, participants will be able to demonstrate the ability to apply active learning strategies and techniques to implement needed improvements in lesson/course.” With this objective in mind, the purpose of the training event was to prepare faculty to introduce changes to their current teaching practices to enrich learning experiences. Determining current teaching practices helped to set the baseline for expectations.

The training participants were faculty members from various schools and disciplines, and they reported having varying experiences with active learning. For some, active learning techniques were quite familiar (“Some of the techniques that you have listed, I used to employ in my classes”, “I fit very well with the flipped classroom sessions”), while others said they needed time to explore all the techniques (“We pretty much use these techniques, elements that contribute to active learning. We have not considered this systematically”). In some cases, the implementation of active learning was prompted by their students who would ask for more practical application (“I employed peer instruction in a small number theory class after they complained they did not have enough practice”).

Generally, the sample of eight participants could be categorized into two sub-groups: more student-centered using a variety of instructional approaches and assessments and less student-centered using one type of instructional approaches and/or assessment types. Namely, two participants chose more than four instructional approaches and assessment types; one participant selected four instructional approaches and three assessment types; one participant
opted for three instructional approaches and four assessment types; one participant selected three instructional approaches and one assessment type; and two participants said they used only one instructional approach and three assessment types. One participant did not make selections in a pre-survey but indicated during the interview practicing only lectures and conducting only tests and quizzes. Overall, lecture as an instructional approach was chosen by seven participants (one participant selected small group discussions as the only instructional approach in use), followed by demonstrations and simulations with four participants using it. Three selections each were made for whole class discussions, small group presentations, hands-on activities, and student presentations (please see Table 5).

The most common assessment approach was test and quizzes, reported by eight participants, followed by six participants who used presentations, and five using group projects. Papers and individual projects were selected three times each. At the other end of the spectrum, only one participant used journals while no one chose portfolios as an assessment type (please see Table 4).

### Table 4

<table>
<thead>
<tr>
<th>Currently Used Instructional Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Lecture</td>
</tr>
<tr>
<td>Demonstrations and simulations</td>
</tr>
<tr>
<td>Whole class discussions</td>
</tr>
<tr>
<td>Small group discussions</td>
</tr>
<tr>
<td>Hands-on activities</td>
</tr>
<tr>
<td>Student presentations</td>
</tr>
</tbody>
</table>

During training sessions, participants shared how they group activities for knowledge checks (“I use group discussion to check the reading comprehension”), and for new knowledge construction (“Students normally are in groups of four or five and choose a group leader. Each student tries to cover the material they were assigned. They return and share knowledge and get ready to prepare for a project”). These comments showed that participants who already encouraged group interaction in their courses did so with purpose.
Course Redesign Plans

The data from the pre-survey showed that five participants started the training with the sense that their courses were well designed, but acknowledged that they could be improved. Two participants felt their courses were well designed and needed very little change. Only one participant felt that their course was not well designed and required major changes.

When asked about the changes that were most needed, technology, activities, and teaching methods were most commonly cited (see Table 6). None of the participants felt that they needed to change their course content, and everyone selected at least one area where they could improve their course.

During training sessions, participants generally focused on redesigning their courses by integrating active learning. Some would mention active learning strategies or approaches like blended learning or flipped approach. One participant stated, “With the 50-minute lectures and work in the lab, we are not able to cover everything. With the blended learning, I think we will be able to arrange this better.” This comment indicates other pressures that influence an instructor’s choice of pedagogical approach, like time, and how active learning could help address multiple class challenges.

### Table 5

**Currently Used Types of Assessments**

<table>
<thead>
<tr>
<th></th>
<th>Participants</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests and quizzes</td>
<td>8</td>
<td>100%</td>
</tr>
<tr>
<td>Presentations</td>
<td>6</td>
<td>75%</td>
</tr>
<tr>
<td>Group projects</td>
<td>5</td>
<td>62.5%</td>
</tr>
<tr>
<td>Papers</td>
<td>3</td>
<td>37.5%</td>
</tr>
<tr>
<td>Individual projects</td>
<td>3</td>
<td>37.5%</td>
</tr>
<tr>
<td>Journals</td>
<td>1</td>
<td>12.5%</td>
</tr>
<tr>
<td>Portfolio</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>
As the participants began to explore active learning techniques that they might use, multiple options were explored. One participant discussed how space (virtual and physical) affected their decisions, stating “In next semester we are offline, and we will have more physical classrooms, and students will be able to physically move, then I would think about jigsaw.” Configurable space and teaching in person also could facilitate gallery walks, with a participant commenting: “Maybe I will be able to use this when we are back in person, and make students walk around the classroom and be active”). Minute papers were deemed useful because “Students will need to come up with a solution in two or three sentences. I want to use this technique to improve students’ critical thinking skills.” Participants found themselves considering from among the many possible active learning options and selecting the ones that would best fit their classes. One participant shared how they considered various approaches and settled on a specific purpose and related collection of techniques.

I will do peer instruction, minute papers, lecture tutorials. I will not do a jigsaw, gallery walks, and think-pair-share. I doubt that I will be able to do concept maps, concept sketches, case studies, teaching with models, and role-playing. I would like to use active learning techniques to recap or introduce new concepts. I would like to write questions on the board and just provide feedback.

This instructor claimed to have certain knowledge about active learning and considered the active learning classroom through the lens of its possibilities to support their current teaching style.

Table 6.

Desired Changes in the Courses

<table>
<thead>
<tr>
<th></th>
<th>Participants</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching methods</td>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td>Student activities</td>
<td>6</td>
<td>75%</td>
</tr>
<tr>
<td>Course content</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Technology</td>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td>Assessment methods</td>
<td>3</td>
<td>37.5%</td>
</tr>
<tr>
<td>Not sure</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Nothing</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>
Some participants were still concerned about taking risks or experiencing failure. Some comments related to these issues include:

- I think when you implement active learning, it is important to solicit feedback from your students.
- It is important to examine your material and look for similar courses for benchmarking. It would be good to integrate best practices. Minimize risks of technological failures.

These participants were concerned with student reaction, using new technologies and ensuring that whatever they try has been effective for others.

In response to these concerns, the importance of planning was emphasized, in terms of both content and classroom preparation. As summarized by one participant:

Every instructor should start with the planning. Especially in large classes. If I start planning for active learning, I would start with selecting the active learning techniques and analyze if they are appropriate for my class. Also, consider the modality and topic.

Another participant noted that the need for planning is not unique to active learning, “Even in a normal class, you have a lot of problems with classroom management. I think for an active learning classroom, preparation in advance is especially important.” Participant considerations did not just focus on planning as a design activity, but also in practical terms, like the need to go to the classroom and ensure that all technology is working properly.

Some participants remained cautious in their view of active learning, and clearly did not view it as a panacea that would transform the class experience. One faculty member suggested that the active learning classroom by itself will not enhance students learning, and indicated satisfaction with their current teaching setting: “Our regular classrooms are well equipped. Having an active learning classroom is just like candy.” With this comment, the participant takes the position that the status quo is satisfactory and suggests that the shift to active learning is just having a classroom with more and different technology available. Another instructor shared this view, highlighting the risk of failure in the new active learning space: “It seems to me like when you learn to drive, and they give you a Ferrari. Of course, it is possible to drive a Ferrari but if it crashes, it will be dramatic”.

Comments highlighted the tensions between using an active learning space and implementing active learning strategies. One participant asked, “Can I implement active learning in a normal classroom?” This question led to this personal realization:
So this is a good opportunity for us to systematize our courses. I would put emphasis on a concept to re-conceptualize courses for future modifications. Even if we do not have access to the room, the knowledge of techniques would suffice for reconceptualization even in a traditional classroom.

Essentially, through the training the instructors came to realize that the active learning classroom, while more sophisticated than a typical classroom and designed specifically to support active learning, is not necessary for active learning to take place. The classroom served as the catalyst for the training, and after the training the participants could use the pedagogical strategies that they used across all of their courses, regardless of the teaching space. In the post-survey, six of the eight participants strongly agreed that they would implement the strategies that they learned during training; one chose “somewhat agree” and one – “neither agree nor disagree”.

Teaching in an Active Learning Classroom

The third research question focused on how faculty plan to use the active learning classroom following their participation in active learning training. In this chapter, data from the surveys and trainings are used to address this question, and in the next chapter this question will be more thoroughly explored through follow-up cases.

On the pre-survey, participants most frequently said they wanted to learn how to facilitate classroom activities during the training (see Table 7), followed by designing learning activities and using the active learning classroom. This finding suggests that facilitation may have been the biggest concern among participants at the beginning of the training, and conceptually this finding connects to comments made during the training about how students would perceive active learning and whether they would participate in it.

Most of the respondents selected multiple items on the survey, suggesting they see the need for a holistic approach when redesigning their course. This approach would consider activity design, learning space, and assessment alongside facilitation which is appropriate given that activity design and learning space will dictate what is appropriate for facilitation.

Table 7 details what training learning intentions were selected by the participants.
In particular, one of the training activities asked participants to think about their teaching and whether this active learning classroom would support it or not. In Zoom breakout rooms, all training attendants were grouped in two or three people. Every group was assigned a particular Jamboard space with possible classroom layouts and a list of the active learning techniques explored during the training. There were two prompts to guide the conversations: 1) what aspects of this room would present opportunities to your teaching? and 2) what aspects would present obstacles to your teaching? Please see Figure 2.

| Table 7. Participants and Percentage of the Training Learning Intentions |
|-----------------------------------------------------|------------------|------------------|
| How to use technology in 6.105                       | 6                | 75%              |
| How to design classroom activities for 6.105         | 6                | 75%              |
| How to facilitate classroom activities in 6.105      | 7                | 87.5%            |
| How to assess active learning                       | 5                | 62.5%            |
| Other                                                | 0                | 0%               |

**Figure 2**

*Jamboard activity*
The answers showed that participants are overall open to implementing various active learning techniques in the active learning classroom. Table 8 shows comments participants made about specific activities. Participants also saw how a combination of active learning techniques could be employed when teaching in an active learning classroom. For example, there were suggestions to provide lecture tutorials with peer instruction and think-pair-share, and to combine case study with peer instruction and think-pair-share, and concept maps with jigsaw.

Here, one participant shares their ideas for implementing active learning in room 6.105:

I think because students can be nicely put in smaller or bigger groups, I could assign them case study discussions. Chairs and tables could be clustered in 4-6 to accommodate students together and make their group presentations. After each group presents their project, we would ask 3-5 questions and grade it. I like to add some sort of competitiveness as young students tend to compete with each other, especially when they have meaningful tasks to complete. Peer instruction, think-pair-share can be performed [in an active learning classroom] as students will have their own place.

As this quote illustrates, participants selected and combined the active learning strategies based on their own preferences, such as having an element of competition.

Table 8

Participants’ Comments About Specific Active Learning Techniques

<table>
<thead>
<tr>
<th>Active learning technique</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Think-pair-share</td>
<td>“We can have a think-pair-share. We provide a graph to the student, and he/she will explain it to another student. A teacher, in this case, becomes a moderator”</td>
</tr>
<tr>
<td>Gallery walks</td>
<td>“Maybe to have gallery walks to encourage students to move around and not be isolated”</td>
</tr>
<tr>
<td>Concept maps</td>
<td>“I will be able to start teaching theories shortly. My profile focuses on data analytics and maps. (With concept maps), I’d be able to promote developing maps: produce, edit, discuss”</td>
</tr>
<tr>
<td>Minute paper</td>
<td>“Now I am thinking of using … minute paper. My students will need to come up with a solution in two or three sentences. I want to use this technique to improve their critical thinking skills. I think it will be useful”.</td>
</tr>
<tr>
<td>Jigsaw</td>
<td>“Another technique that I want to employ would be jigsaw for reading materials”.</td>
</tr>
</tbody>
</table>
The techniques examined during the sessions were selected, and their usage described. Among the most popular active learning techniques with the highest potential of adoption were “think-pair-share”, “gallery walks”, “concept maps”, “minute paper”, “jigsaw”.

Participants showed their interest in implementing various active learning strategies or approaches, always considering their appropriateness and effectiveness in improving learning outcomes.

The importance of the furniture was specifically highlighted due to the group activities exploit. Participants were aware that the furniture in classroom #6.105 would allow students to move around the room, change seating positions and configuration, and thus contacting various people during class time. Furniture flexibility frequently was mentioned as a way to support group activities, with participants commenting that it “makes it easier to cluster students in groups” and that “group discussion [and] work as teams is encouraged in this room.” However, some participants were concerned that the classroom’s configurability could lead to some of its own challenges:

If we cluster students in four groups, they have to work on assignments and then present. So one of them needs to stand and present. Some of the students will be able to look at the presenter, but others will have to crane their necks to be able to follow the presenters. I would redesign the seating and think more about the whiteboard. Or put wallpaper somewhere where it is visible for everyone.

Other participants were concerned that teaching in the classroom would cede classroom control to the students and lead to negative behaviors:

If we are going to do some quick tests, those should be just for fun. But if we are doing a quiz, you get to implement time solutions so students do not have time to look around the room. You need to be very careful.

It also is interesting to observe how specific features of the active learning classroom would be considered as a shortcoming for one participant and an opportunity for another. For example, one faculty member said the size of the classroom (64 seats) was too small while another faculty member said, “the classroom is quite big, it would be difficult for me to manage students”.

Two additional themes arose during the training discussions around the role of the active learning classroom on campus: students’ learning preferences and online/pandemic teaching. In
terms of preferences, participants expressed their concerns about the reaction they would get from the students when shifting their teaching to an active learning environment. In particular, they worried that students would not accept a change in role of the instructor and they considered that they might need to inform the students about their changing duties to better prepare them for this transition. It was noted that active learning overall has the potential to guide students. In contrast to a traditional theater-style classroom with a lecture focus, the active learning classroom provides an opportunity for scanning the students in the class, and “you can pay attention to everyone.” Participants felt that students might be uncomfortable with this shift which would put more emphasis and attention on student interaction.

Because almost all classes from March 2020 to the time of the training were taught online at NU due to the pandemic, participants could not avoid contextualizing their teaching by comparing it to this recent online learning experience. Some mentioned the challenges of implementing active learning online, while others said they already started implementing active learning because of the online modality. Also, one participant considered the extent to which the active learning classroom is suitable for hybrid teaching, stating “this room needs to be technology-equipped for hyflex.” Pandemic experiences add another dimension to this shift toward active learning that had not been anticipated when the active learning classroom was developed.

Summary

This chapter documented the findings on data collected from all eight participants through the surveys and training activities. Whereas participants reported using teacher-centered strategies, such as lectures and tests, the training exposed them to new options. A variety of barriers were identified, but participants worked through many of these during the training and developed solutions such as planning and choosing one or two strategies to try first. Next, Chapter 4 examines the learning paths and course redesign intentions of four participants more closely.
CHAPTER 4

CASES WITH ACTIVE LEARNING

In this chapter, four cases are presented. The data come from instructor reflections during the training and interviews after training. Three of the instructors announced a willingness to redesign their courses with active learning, with two of them decided to shift their teaching from traditional to active learning classroom in the Spring 2022 semester. Additional data for these two implementation cases come from the researcher’s observations during the consultations conducted after the training.

The two participants who started to prepare for teaching in an active learning classroom asked for weekly regular meetings to redesign the courses with active learning. These weekly meetings helped me observe situations in which participants engage in “object-oriented activities relevant to the study” (Yamagata-Lynch, 2010, p. 71). Overall, my role as an Innovative learning officer was to support them with instructional design expertise and provide administrative support in active learning classroom booking and technical support.

Before establishing an individual activity systems model for each case, I conducted a thematic analysis of the interview transcripts to examine the data if it can answer the questions about the subject of the activities, activity sets, tools, rules, community, and division of labor involved in these activities, as well as initially identify the tensions and outcomes (Yamagata-Lynch, 2010, p. 75). A narrative supports each case about the subject and a figure showing the individual activity system model. Four levels of contradictions are presented for all cases.

**Dr. Akylbek Munay’s Case: Shifting Teaching to an Active Learning Classroom**

Dr. Akylbek Munay (a pseudonym) is a postdoc in Sciences and Humanities. He had previously participated in courses on learning theories, but it was his first time learning about active learning at NU.

In the Spring 2022 semester, he planned to teach an elective course that initially was slated to be taught in a blended modality through the combination of face-to-face classes and online discussions with learning materials accessible through a Moodle course site. However,
due to a new pandemic wave in the country, the semester was shortened. The semester started two weeks late, with the first weeks being taught fully online.

Akylbek started to teach at university in the Fall 2021 semester. Upon completion of the training workshop, he decided to teach this course in an active learning classroom for the first time. It should be mentioned that although the course existed at the school of sciences and humanities, it was taught by other instructors. For Akylbek, the course would be taught for the first time. He had a syllabus from the previous instructor; however, he introduced several changes to it due to active learning implementation. During the interview in person on September 30, 2021, Akylbek indicated that he valued active learning because students would “begin to understand more”.

Interestingly, before the training was over, he started experimenting with active learning implementation. According to him, he normally speaks for 50 minutes every class. After the second training session, he delivered a class structured around several lecture segments accompanied by think-pair-share activities in-between. “During the lecture, what I noticed, students were more engaged; there was constant feedback. Normally, students do not provide any feedback during class time, but I could recognize where they had problems today. So, I would like to experiment further” (Akylbek, September 30, 2021).

The Activity System

The following activity systems diagram was developed based on Dr. Akylbek Munay’s experiences in adopting active learning to shift his teaching from a traditional classroom to an active learning classroom (see Figure 3). Each element of the activity system is described individually.

Tools. Akylbek used several tools during the course design process. First, he used the training Participant Handbook to describe the most popular active learning techniques. Second, he used the Google drive folder with the materials about active learning implementation in STEM created by me. Third, he used corporate email to inform me about the meeting agenda items and confirm the meeting times. Fourth, for his syllabus composition, he used LaTeX, which helped make a PDF document look accurate with the mathematical formulas. When the syllabus was ready, he started to work on his Moodle course site locating all the instructional materials he had, including YouTube videos. He also recorded an introduction video explaining
the discipline major highlights (“why you need this course?”) and course structure. This video was recorded in the Innovative learning hub’s studio and was edited with the Adobe Illustrator package.

In addition, he used an active learning classroom to visualize his future teaching in the room. I arranged two visits to the classroom to check the technology installed there (e.g. document camera) or rehearse student group activities managing seating arrangements.

![Diagram](Image)

**Figure 3.**

*Individual activity system model for Dr. Akylbek Munay*

**Rules.** To redesign the course, which has been taught before by other instructors, Akylbek was following curriculum development guidelines using a “Course specification form” template. Also, he followed the recommendations from NU librarians regarding instructional materials to be used in the course. There were only two copies of the main textbook available, so that Akylbek had to prepare the notes and share the YouTube video links. Also, to be able to
book the active learning classroom, he had to provide a justification showing how active learning techniques have been integrated into his teaching.

**Community.** Akylbek’s active learning community consisted of training participants from his cohort and me. Also, there was one joint meeting of Akylbek, Stefano (also training participant from the same school and department), and me in person, who helped in defining major highlights of the course redesign. Through the email correspondence and a shared Google drive folder, we were able to discuss the resources related to effective course design with active learning and research articles describing best practices and templates with instructions on concrete active learning techniques.

**Division of Labor.** Akylbek attended all three training workshop sessions on “Teaching in an Active learning classroom” and requested consultations. Starting from December 2021, such consultations took place every Monday and Wednesday until the course started in the Spring 2022 semester. My role was to provide Dr. Munay with instructional design support involving Moodle course site set-up, learning activities creation, and some administrative issues like active learning classroom booking and classroom preparation. During the consultations, Akylbek worked on his course materials, adding class group activities. The weekly conversations also helped Akylbek refine the course redesign, which included the formulation or clarification of course learning outcomes, design of assignments, and creation of multimedia assets like introductory videos for the course. As Akylbek stated in his interview, the most challenging part in designing a course with active learning is that “you need to plan everything carefully, and design more activities” (Interview, 30/09/2021). In addition, the issue with the availability of the textbook for the course led to email correspondence with the librarians about the copyright issues. As a result, Akylbek provided an alternative option on Moodle, which were YouTube videos representing similar material. However, this situation raised the importance of creating Open Educational Resources in collaboration with the librarians to avoid textbook shortage and unavailability during pandemic times when not all students can order a book from the library.

**Outcomes.** The outcomes of Akylbek’s activities included: 1) increased knowledge about active learning and active learning classroom, 2) acquiring competence in instructional design, and 3) better focus on learner needs. In interview, he mentioned that his reason to teach in an active learning environment was students:
My main problem is that students that come to my elective course have various background knowledge and capacities with linear programming. So I had to somehow lower the difficulty level. But with active learning, I might be able to support those students who are more advanced than the rest of the class (September 30, 2021).

Akylbek’s intention to not only integrate active learning techniques but teach in an active learning classroom was based on his personal beliefs and teaching philosophy to meet learner needs.

**Case Summary.** At the beginning of his project, Akylbek had limited knowledge about active learning, and he had never taught in an active learning classroom. He had to ask lots of questions related to active learning and spend a lot of time exploring it. Along the way, he had become knowledgeable about active learning environments. In Akylbek’s case, his readiness to shift from teaching in a traditional classroom to an active learning classroom was due to the training workshop. In an interview, when asked about what would convince him to use active learning, he stated that he was already convinced. He also said:

> After the training, I think I have developed my philosophy of active learning. Before, it would be alright for me to just lecture because of the limitations like few textbooks. But now, with all the resources available online, professors should not just lecture during class time.

The tensions identified during the conversations with Dr. Munay regarding the active learning implementation were around division of labor (booking of an active learning classroom, copyright issues) and tools (uncertainty about how active learning would work in an active learning classroom).

**Tension Around Division of Labor.** Training attendees were supposed to have a priority over classroom booking. However, during the training workshop, several participants expressed their concern over a possibly high demand for the classroom, which had appeared in the Registrar system as available for booking by anyone. The room was open for booking without a requirement to implement active learning in the course. This classroom is one of the largest classrooms in the School of Mining and Geosciences and became even more attractive after its redesign. The identified tension in the conversations with Akylbek and other participants resulted in the problem solution in two ways. First, the special booking notice was placed in the Registrar system, which included a form for indicating how the classroom will be used and what active learning techniques would be applied. Second, resulted that the training participants were not
aware of the first active learning classroom located in the library. This facility has not been used
by our faculty. When Akylbek learned about this facility he decided to use it for his classes to
avoid issues with booking of a new active learning classroom due to possibly high demand.

**Tension Around the Tools.** During the conversations, Akylbek expressed his concern
about how active learning would work, especially in an active learning classroom which was
absolutely new to him and students. He said it was “difficult to envision” the final product. To
better prepare for the coming semester, I arranged two meetings with the IT personnel in the
active learning classroom to check the audio and video features of the room and the functionality
of various tools in the room like document cameras or cables to the screen on each table. For the
active learning implementation, Akylbek decided to first experiment with fewer techniques
(“one-two techniques each session, and see what works well and what doesn’t”).

**Prof. Stefano Fiori’s Case: Shifting Teaching to an Active Learning Classroom**

Prof. Stefano Fiori (a pseudonym) is an Assistant Professor in the School of Sciences and
Humanities, Department of Mathematics. His teaching load is 3+3. Two of the courses are
service courses of a larger section, and one course is an elective course for upper-year majors.
The object of his activities was twofold: 1) shifting to teach in an active learning classroom and
2) improving his teaching. Before the pandemic, his teaching was in a large auditorium with
enough writing space, which comforted his teaching style. As he stated in the interview: “I write
a lot in detail, and people follow. I try to get feedback sometime, but mostly this is passive
learning” (Interview, October 6, 2021). The reason Prof. Fiori wanted to integrate active learning
was to change both his teaching style and students’ study habits:

[active learning] could help being more attentive to individual students’ needs, to get a
better feel of the pulse of the class, of the group of students that require more attention. In
a traditional setting, I would see that students misunderstand something after quizzes or
midterms. And I will go to that. Hopefully, with active learning, I’d be able to take more
preventive measures to avoid this… I want to change their study habits. They spend all
night to prepare for the exam, and then they come or even do not come because they do
not hear their alarm clock.

During the interview, Stefano described his teaching philosophy as not make students
learn something but “open their minds”: “My task is to do my students more active participants
in the class. To make them more intellectually curious. This will be the reason for me to
introduce active learning.” For the active learning implementation, Prof. Fiori chose his elective course and as he justified his selection, he wants “to see how it goes with the small class before taking risk with a bigger class”.

Although he did not have to make any substantial changes to the course or select new instructional materials, he shared what he would like to change. In particular, he would select the most challenging topics for students and chunk those into up to four parts. First, he would assign pre-class reading, which will constitute Part 1 of the lesson. Their knowledge of the reading will be checked with a minute paper. Second, during class time, the students will be divided into pairs or groups of three to analyze various aspects of the topic. Part 2 could be facilitated with the help of the think-pair-share technique. Third, for Part 3, he would provide teacher synthesis “so that every student comes out of my class with greater understanding”. Here, he particularly mentioned his resistance to try peer instruction technique (“even bright students, when they explain the problem to their classmates, tend to explain it awkwardly and not always correct”). Finally, Part 4 would mean further exploration, and students could be grouped in small groups to work on an assignment, the results of which would be shared with the rest of the class.

So maybe before theoretical justification in Part 3, I would expect from students to apply their knowledge to practical activities. Students should know Part 1, and they are at least aware of Parts 2 and 3. And Part 4 is for some people who would be able to do this. I could put some more activities to the end of the class. Maybe teaching with models. I will prepare a worksheet and the students will have to fill in the blanks by the end of the class. This could be a wrap-up activity.

It should be mentioned that due to a new pandemic wave in the country, the semester was shortened and Prof. Fiori decided to build his course with the consideration of the probability that it will take place mostly online. For this, he defined having weekly activities on Thursdays only, with occasional graded activities about every other week. He also would have weekly online forum discussions.

The Activity System

The following activity systems form was developed based on Prof. Stefano Fiori’s experiences in adopting active learning to shift his teaching from a traditional classroom to an active learning classroom (Figure 4).
Prof. Fiori used several tools during the course redesign and active learning techniques selection process. First, during and after the workshop, Stefano referred to the training Participant Handbook with the description of the techniques and the google drive folder with the materials about active learning implementation in STEM. Second, he used corporate email to get information about specific items related to the active learning classroom. In particular, special focus was placed on the classroom booking due to changing requirements from the registrar's office based on pandemic restrictions. We went to check the active learning classroom to visualize the group formation classroom management and download software on the computer to be used during the class. In addition, during the third training session, he used his iPad to outline the lesson design with several active learning techniques based on a team-
based approach which was shared as a picture with all the training participants calling for their comments.

**Rules.** The guideline used by Prof. Stefano Fiori was a “Course specification form” template. Interestingly, it happened so that his participation in the training coincided with the beginning of his School’s preparation for the accreditation, which had several requirements to be followed, the details of which were not provided to me.

**Community.** Stefano’s active learning community consisted of training participants, Akylbek Munay, and me. During the training’s third session, several participants provided their comments about Stefano’s lesson plan. Besides, he had access to a shared Google Drive folder with the resources related to effective course design with active learning in STEM. He provided notes with feedback on research articles describing best practices and templates with instructions on concrete active learning techniques. Although they were not directly involved in the course design process, Prof. Fiori always mentioned his students as beneficiaries of all the teaching novelties in his course.

**Division of Labor.** Professor Fiori attended all three training workshop sessions on “Teaching in an Active learning classroom” and requested consultations afterward to address any concerns he had. The increased competence and knowledge helped him prepare for his shift from teaching in a traditional auditorium to an active learning classroom. During his interview, he mentioned that preparation would take much time during the redesign process: “I guess that there will be more preparation required on my side at the beginning because I need to lay out the roadmap of the lesson. I normally know what to do when I teach large audiences, and everything depends on me. So if anything comes up, I can find a solution on the fly. But if it requires more than delivering the material, issues like classroom organization, time management, I need to re-learn how to teach.”

**Outcomes.** The outcomes of Stefano’s activities included: 1) increased knowledge about active learning and active learning classroom, 2) the redesign of the course with active learning techniques integration, and 3) better focus on learner needs. Specifically, he showed his readiness in implementing active learning techniques examined during the training workshop. Also, various times during the conversations, Prof. Fiori mentioned his interest in active learning classroom describing its layout as “great” mentioning the importance of provided training
support. He stated: “The whole project made me comfortable in preparing for teaching in an active learning classroom.”

**Case Summary.** Prof. Fiori knows exactly his strengths and weaknesses in teaching and used the shift to teaching in an active learning classroom as an opportunity to enhance his teaching style as an attempt to address his learners’ needs better.

The tensions identified in the analysis of his interview include concerns with the classroom management at the beginning of the classes and students’ resistance to change their study habits. Later, due to political situations and pandemic restrictions, he assumed that the spring semester would be taught online. This introduced several changes to the development of instructional materials for the course. In particular, more efforts were made to prepare short videos to enhance the material presented. Also, the active learning techniques were examined for their viability in an online environment.

**Prof. Kulzaida Bigaliyeva’s Case: Integrating Active Learning into Teaching**

Prof. Kulzaida Bigaliyeva (a pseudonym) is an Associate Professor in the Sciences and Humanities. She normally teaches two courses per semester. Twice a week she has classes for each course. If classes are on Tuesday and Thursday, then she would present new material on Tuesday and have more activities on Thursday. She got interested in active learning classroom because of her self-efficacy concerns. As a teacher, she wants to be updated with new tools, techniques or facilities. In the interview that took place on November 8, 2021, she mentioned that she had an extensive experience with active learning, however, there were techniques examined during the training that were new to her: “For me, techniques like Jigsaw, concept map, lecture tutorial are well known as I use those in my classes. But some are new: minute paper, think-pair-share, gallery walks.” She also mentioned that she had never taught in an active learning classroom before. She plans to teach some of her classes in an active learning classroom in the future.

**The Activity System**

The following activity systems diagram was developed based on Prof. Kulzaida Bigaliyeva’s experiences in adopting active learning and her plans about future teaching in an active learning classroom (Figure 5).
Tools
- Training participant handbook;
- Corporate email;
- Time allocation for course redesign.

Subject
- Prof. Kulzaida Bigaliyeva who is a Kazakh language teacher.

Figure 5.
Individual activity system model for Prof. Kulzaida Bigaliyeva

Tools. During the training, Prof. Kulzaida Bigaliyeva used a training Participant Handbook. She would pose the questions related to the information in that handbook. She mentioned that she would like my assistance in preparing a similar training workshop in the Kazakh language with the activities specifically designed for Kazakh language teachers. As Kaulzaida did not start incorporating active learning immediately after the training, she did not use any other specific tools. The corporate email was used to make an interview appointment and discuss her current teaching practice related to assignment diversification which does not lay within this research study. However, she mentioned the time allocation that she would need when planning for course redesign and classroom shift.

Rules. Kulzaida mentioned that with the online format she has already changed her instructional materials to adjust to online teaching. Besides, she already implements some of
active learning techniques: “Normally, a class lasts 75 minutes and it is impossible to have one type of teaching the whole class time”.

Community. Kulzaida’s active learning community consisted mainly of training participants with whom she discussed teaching strategies and concerns. Also, although not being directly involved, her students were the major reason for her plans of active learning implementation in the course.

Division of Labor. Prof. Bigaliyeva attended all three training workshop sessions on “Teaching in an Active learning classroom”. She did not request the consultations related to course redesign with active learning or planning a shift in teaching in an active learning classroom. However, she began to approach me to discuss instructional design related issues.

Outcomes. The outcomes of Kulzaida’s activities included: 1) increased knowledge of active learning and active learning classroom, and 2) improving competence in instructional design. In addition, her participation in the training resulted in a new project development. In particular, she asked me to jointly develop an academic development project for Kazakh language teachers in the country about active learning implementation.

Case Summary. The case of Prof. Kulzaida Bigaliyeva, although it did not lead to a shift in teaching in an active learning classroom, helped enrich teacher experiences which led to enhanced teacher self-efficacy. Participation in a training workshop provided a necessary platform to discuss ideas about innovative teaching. During reflection activities, Kulzaida actively posed questions to other attendees compared to her own teaching practices.

Prof. Omar Detroit’s Case: Planning for Future Teaching in an Active Learning Classroom

Prof. Omar Detroit (a pseudonym) is an Associate Professor in the School of Mining and Geosciences where a new active learning classroom was introduced. Every semester he teaches four courses, one of which is an elective course. Omar describes his teaching style as traditional (“a teacher standing in front of the class and students listening”, interview, October 5, 2021) with elements of interaction (“when showing the slides, I would stop for short discussions to clarify”). He also mentioned that he embedded one or two active learning techniques like jigsaw before pandemic teaching. However, for him, teaching online was a challenge itself, and he had to stop trying those out:
Last year, I tried jigsaw. I got a comment from students that it was very interesting. I stopped because of online. Now, I am back to traditional.

For Prof. Detroit, active learning presents more opportunities than barriers. The biggest advantages of its implementation would be increased teacher self-efficacy and changed roles of the students. His philosophy is to stop teaching students and make them more creative (“make them describe their ideas through concept sketches as we examined during the training”), linking them closer to the industry routine where engineers with various backgrounds are using active learning to brainstorm and create the plans when peer learning. Omar specifically mentioned the necessity of an instructor's constant guidance when implementing active learning (“students cannot do everything themselves”). He stated:

Students have problems with learning. So, if every lecturer now starts to implement active learning, students can become very heavy loaded. For example, I give ten chapters in the semester. Not all ten chapters can be implementing active learning techniques. Two or three should have it, though. Here, guidance is very important.

Speaking about the advantages of implementing active learning into teaching, Omar stated that active learning could help him resolve his biggest problems: concern about not covering all content by the end of the semester and conducting effective assessments. Both were worsened due to online teaching: “I would be more expert in teaching and learning. And I would like to make my students more active and have some responsibility for their knowledge. Students need to explore {the oil field} now while they are learning. They will not have time to explore it when they start to work. That is why active learning is important. The teacher should be considered a consultant, and the students need to constantly learn on their own and not be limited by the readings that I provide. They should ask and explore more than will be required by the work… Students actually like to participate. Some students are active, but some are too quiet. With active learning, I’d be able to work closely with this category of students.”

At the same time, he is not going to change anything drastically in the nearest future. Several concerns are involved. First, he has various course levels – undergraduates, master’s and PhD students – and it is impossible to implement active learning at the same pace and within the same scope (“at my previous university, we have various courses that were combined together. I will try to communicate with another lecturer to try to implement something similar”). Second, he needs time to prepare in advance due to the workload that includes both teaching and research
with graduate students supervision: “In some universities, lecturers are either research-based or teaching-based, but here we are full of load. We need research related to teaching not to our disciplines. We can’t make half work: I can conduct research first, and then if I have time, I will be doing active learning implementation. We can’t do this. We need to focus on active learning redesign during the whole year. Maybe the university needs to think of how to support faculty.”

Interestingly, if changes were needed, he would use an active learning approach to change the introduction within the first three chapters and present the material about industrial technology, which is not sufficiently covered in current textbooks.

The Activity System

The following activity systems diagram was developed based on Prof. Irawan Sonny’s perspectives and plans for future adopting of active learning and teaching in an active learning classroom (Figure 6).

Tools. Like other training participants, Prof. Omar Detroit used a training Participant Handbook. Although he expressed his willingness to start working individually on active learning incrementation, he did not contact me on this after the training. The corporate email was used to make an interview appointment for the research study. In the interview, he mentioned time allocation that would be needed when planning a course redesign (“one semester in advance”).

Rules. During the training, Prof. Detroit asked about the university documentation related to course monitoring. The template for annual course monitoring form was shared with all the training participants including Omar, for reference.

Community. Prof. Detroit’s active learning community consisted of training participants with whom he discussed teaching strategies and concerns. And although not being directly involved, his students were the major reason for his interest in active learning implementation.

Division of Labor. Prof. Detroit attended all three training workshop sessions on “Teaching in an Active learning classroom”. He did not request consultations related to course redesign with active learning or planning a shift in teaching in an active learning classroom.

Outcomes. The outcomes of Omar’s activities included: 1) increased knowledge about active learning and active learning classroom, and 2) improving competence in instructional design.
Case Summary. Although Prof. Omar Detroit did not start any redesign of his current courses with active learning implementation, he mentioned various times during the training and an interview that attending training workshops was important and useful and helped build a community of practice. He suggested expanding the training events and making them more narrowly focused with a day focused on a concrete active learning activity design and development.

Levels of Contradictions

Based on participants’ discussions and reflections, four levels of contradictions were observed in this study. When these contradictions are resolved, activity system can experience...
transformations. Thus, identification of the levels of contradictions aims at finding the ways to increase the shift to teaching in active learning classrooms.

**Level 1: Primary Contradiction.** Inconsistencies among the formal NU Strategy call for student-centeredness and absence of any faculty support in terms of time allocation or workload reduction for course redesign to implement innovative teaching methods. In this regard, teaching in an active learning classroom would necessitate administrative support. For example, developing a learning spaces strategy as a guiding policy emphasizes the strategic priority of an active learning framework on campus.

**Level 2: Secondary Contradiction.** This type of contradiction occurs when a new aspect of the activity brings conflict to the participants. In this case, because the classroom was redesigned into an ALC, the priority to book the room goes to training participants and thus they might feel obliged to use it. It also suggests that teaching in an active learning classroom by some faculty members may raise concerns among other NU faculty members. Before the redesign, a lecture hall was available for everyone for booking and did not require any specific type of instruction. However, after the redesign, a new requirement in the classroom booking system appeared. To avoid facility misusage, for any classroom booking it is necessary to provide a rationale for using this classroom by indicating the active learning techniques employed in the classes.

**Level 3: Tertiary Contradiction.** This type of contradiction may be obvious over time meaning that any changes in any of the ASA elements will force a change in the activity. The more participants complete the training workshop, the higher will be the number of course redesigns to implement active learning, and more requests to teach in an active learning classroom will be. This will necessitate more active learning space transformations. To prepare for this scenario, it is necessary to develop the learning spaces strategy that will gradually redesign the learning spaces to active learning classrooms.

**Level 4: Quaternary Contradiction.** Quaternary contradiction comes from disruptions like political instability or pandemic restrictions making it difficult for faculty to follow their initial plans as it occurred in this case. The training workshop took place during the Fall semester, and the context was that starting from the Spring 2022 semester, classes with 40 students and fewer will be taught offline. This assumption was why Dr. Munay and Prof. Fiori started to redesign their courses and prepare to shift their teaching to an active learning
classroom. However, with another pandemic wave in the mid of January, Government extended the curfew. In this regard, the university announced the Spring 2022 semester to be online until the Spring break (March 21-25). Both instructors felt uncertain about the continuation of course redesign work. However, with the work being done regarding the course planning and learning activities designed with an active learning approach, both decided to implement active learning in their courses online to use the active learning classroom whenever possible, considering the pandemic situation.

**Summary**

The discussion around the extent to which the training workshop affects faculty readiness to change their teaching practices is presented through the four cases. For each case, an individual activity system model was developed.

Every case is unique in this study, despite participants attending the same training and having the same access to the materials and institutional support. While analyzing the data, it was important to reorganize the raw data coming from various data sources to “find a participant’s story” (Yamagata-Lynch, 2010, p. 71). Each participant’s story reflects not only their training experience, but also their prior teaching experiences, their teaching and learning beliefs, and the overall context or activity system that surrounds their work.

In the interviews, academics expressed their interest in the new facility usage. However, only two of the four cases presented in this chapter represent participants who definitely were shifting the teaching to an active learning environment. The two courses taught in an active learning classroom would be built around team-based active learning with interactive lecture sessions. Both cases appeared due to teacher motivation encouraged by the training workshop.
There has been a constant call to employ innovative teaching methods like active learning to increase learner engagement and enrich learning experiences and develop so-called 21-century skills to raise employability profile and support lifelong learning (Benoit, 2017; Howell, 2021; Valenti, 2015; Wanless, 2016). In this regard, the role of the physical learning spaces has been the subject of much research and innovation in higher education (e.g., Birdwell & Uttamchandani, 2019; Brooks, 2012; Carnell, 2017; de Borba et al., 2020; Lam et al., 2019) exploring the adoption of active learning spaces and their impact on learning. In addition to learning, well-designed and comfortable learning spaces promote well-being (de Borba et al., 2020).

The spread of active learning classrooms on university campuses raises a necessity to equip university faculty with the knowledge about the pedagogical use of such classrooms (Donnelly & Berry, 2019). Faculty professional development programs aimed at supporting them in using these spaces to their maximum potential with one desired result – improved student outcomes (Guskey, 2002).

The data collected for this study were analyzed in several ways. First, the responses from pre-and post-surveys were analyzed. Second, the transcribed conversations during training workshop sessions were analyzedThematically. Third, Engeström’s (2014) Activity systems analysis was applied as a supplementary tool in a case study to analyze four interviews to identify what faculty members perceived as sources of conflicts in their plans to shift teaching to an active learning classroom.

This chapter provides a discussion of the data analysis and findings reported in previous chapters and explores how the findings add to existing literature about faculty professional development in higher education to prepare for the teaching in an active learning environment.

**Barriers to Active Learning**

Finding out the barriers that hindered faculty to shift their teaching from a traditional classroom to an active learning classroom was one of the purposes of this study. Understanding
faculty members’ perspectives on the barriers to implement active learning helps explain the reasons behind their resistance to shift their teaching to an active learning classroom.

The literature identifies several barriers to the translation of active learning to classrooms. The biggest is the overall resistance to any type of novelty in instruction both from faculty and students (Borrego et al., 2018; Ito & Kawazoe, 2015). Data from the thematic analysis of training attendees conversations and activities suggest that teachers perceive four major barriers: a) lack of time to redesign the course integrating active learning techniques with the additional workload that this shift would require, b) students attitude towards active learning, c) instructional design concerns, and d) concern about university support.

Barriers of time and workload can be considered as self-perceived barriers. Training participants acknowledged that they would implement active learning if they were given time and decreased their working load (without cutting research commitments) to redesign their courses. At NU, active learning classrooms are not a main focus in learning infrastructure with so-called “traditional classrooms” remaining the major type of learning spaces. For this, the redesign of the classroom is considered as a pilot project to get faculty familiarize with and inviting them to gradually integrate active learning techniques and strategies first. As research confirms, independent of classroom layout or design, the significant impact on student learning is produced through the facilitation of active learning rather than merely using this type of classroom for instruction (Lasry et al., 2013).

Next barrier, students attitude towards active learning, can be interpreted in several ways. In research, student negative responses to active learning have been frequently cited (e.g., Finelli et al., 2013). However, during the conversations with training attendees, the overall focus was not on the faculty preoccupation about being badly evaluated by the students rather the concern was in students’ abilities to accept novelties in learning routine. The concern about the workload on the part of the students was present in the research before the COVID-19 (e.g., Fernandes, 2014), however, with the pandemic experiences and students’ well-being being one of the focal points it became louder.

A barrier related to instructional design concern is not a new one (e.g., Drew & Mackie, 2011). Training participants need more than one professional development event to implement active learning techniques. The interview participants who opted to shift their teaching to an active learning classroom requested me to design and develop materials and activities. To some
extent, we deal with the motivation - normally considered a pure student’s responsibility (Keller, 1987) - to develop teacher self-efficacy. As an Innovative learning officer, my role is to help faculty change their beliefs about their abilities and inspire them to do more than they think is possible.

The barrier related to concerns about university support has its roots in the overall perception of uncertainty about the university’s plans towards active learning classrooms. The absence of a clear campus spaces vision with the active learning framework prevents faculty from shifting their teaching to an active learning classroom in the short and medium-term. At the same time, challenges revealed in research about the difficulty of measuring active learning usage (Arruda & Silva, 2021) reduce support from university administration to commit to overall campus active learning implementation. Existing models that evaluate active learning implementation through self-reported questionnaires invite the risk of bias from faculty and students. There is a need for more evidence-based research to support active learning environment expansion with this vicious circle.

Finally, as Monahan (2002) stated, classroom design can inform curriculum, which makes space either help or hinder the adoption of teaching methods. Though not considered a barrier, the active learning classroom itself can hinder active learning implementation when instructors do not possess prior experience teaching in such spaces. Research shows that active learning classrooms help instructors facilitate active learning (Holec & Marynowski, 2020). And here, the provision of professional development events, as well as faculty individual support for an extended time, are important.

Training for Active Learning

The second question investigated how training on active learning helped faculty reconceptualize their courses.

Though the teaching style adopted by most participants in this study was lecture-based teaching, many of them mentioned having some amount of experience and knowledge about active learning. According to the participants, several barriers should be overcome to implement active learning or shift teaching to an active learning classroom. The most common denoted barriers include time and workload, students’ attitudes towards active learning, instructional design concerns, and university support issues. The academics, though without specifically
framing it, expressed their concerns around active learning integration and active learning acceptance by the students. These concerns can be framed through the perspective of motivation. Some work should be centered around increasing motivation among the students to complete necessary pre-class assignments and among the academics.

Interestingly, the “students’ resistance” barrier selected by the pre-survey respondents was expanded during the training conversations. Thus, it is not always the students’ resistance to working harder when placed in a new environment. Participants shared their concerns about students’ well-being for the possibility of getting stressed. Besides, faculty reported that institutional support and perceived usefulness of infrastructure novelties were factors that impacted active learning integration and a shift to teaching in an active learning classroom. In this context, university support does not mean the provision of necessary infrastructure and resources but also a chance for failure for faculty because of the risks associated when a new teaching approach has to be implemented. Support for this notion is found in instructors’ questions on how university administration would address such failures.

Many of the participants felt that training helped them overcome those barriers. According to the literature review, the use of active learning techniques contributes to the effectiveness of the training (Freeman et al., 2014). Modeling active learning in my training workshop helped faculty understand an approach like active learning that “they may not have experienced as learners themselves” (Lombardi et al., 2021, p. 14). However, according to participants, such training events should happen more frequently and focus more on specific tools and techniques. There was a call to practice concrete techniques in the form of a game. The overall training feedback can be summarized by a phrase from one of the participants: “everything is clear, and we just need to start implementing it!”

Another way to look at these findings is to consider how the university can support the teaching practices that seek enrichment of learning experiences. Sustainable educational environments should be grounded in the university's strategic goals and mission (Ashley et al., 2015). Considering the evidence that learning spaces can be an agent of change in teaching and learning, institutions should be examining the possibility of making it one of their strategic priorities.
Plans to Use Active Learning

The third research question investigated faculty plans to use the active learning classroom following their participation in an active learning training. The findings to this question should serve as an evaluation of the training effectiveness as the purpose of the training event was to prepare faculty to get ready for using active learning classroom in their teaching.

Although changes in campus learning infrastructure do not automatically lead to changes in instruction, there is research evidence that classroom design contributes to alterations in teacher behavior (Brooks, 2012) with the possibility of space to “dictate” the teaching modalities (Granito & Santana, 2016, p. 6). The training activities revealed that participants though they do not limit themselves to the classroom features, tend to be cautious in implementing particular techniques due to the classroom layout. To analyze the plans about active learning classroom usage, faculty members representing various disciplines and ranks and active learning backgrounds were first invited to describe their current teaching practices. It was revealed that lecturing with tests and quizzes is the most popular instructional approach. However, some applied various activities in-between, mainly built upon group discussion. As one participant summarized it, there is the practice of using active learning techniques, however, not systematically.

Individual Active Learning Cases Analysis

Despite the overall number of training participants (N=20), eight consented their participation in this research study with four agreeing to be interviewed. Two actually shifted their teaching to an active learning classroom as a first-time experience in their careers. They actively participated in all three training workshop sessions, and three were the only participants who brought their initial lesson redesigns for the microteaching session during day 3. The individual activity systems analysis for each of the four cases helped in understanding the level of their readiness as well as plans to shift teaching to an active learning classroom. At the same time, the data collected after the interviews helped to describe the four levels of contradictions.

Significance of the Study and Future Implications

With changing expectations for higher education, the evolution of learning spaces as part of the learning experience is an inevitable process. The investment pressures reside both in the
classrooms redesign and faculty training and motivation to use those effectively (Pernod, 2021). At the same time, an active learning classroom geography map is scarce. Despite the active learning classrooms redesign cases, the framework is not implemented ubiquitously, happening mainly in some parts of the campuses of US and Canadian universities.

The significance of this study in advancing disciplinary understanding can be supported through the intersection between the introduction of active learning classrooms on campus by redesigning traditional lecture halls and the provision of faculty professional development programs. In particular, it furthers our understanding of the effects of professional development events on adopting active learning and getting ready to shift the teaching to an active learning classroom.

Of course, much work needs to be done to understand how a given support tool – in this case, training – is appropriated by various teachers. Findings from this study have implications in the development and evaluation of faculty professional development programs to support higher education faculty in shifting to teach in an active learning classroom. This study provides a framework for analyzing training content, participant experiences, and supporting faculty needs in changing teaching practices.

The findings of this research study have practical implications for academic developers, researchers, university leadership as this research study documents the process followed to design, develop and deliver training workshop for faculty when an active learning classroom is introduced on campus. Thus, it is hoped that academic developers in an attempt to enhance the student learning experience at other universities may find this study applicable to their contexts. At the same time, university leadership can find the similar challenges experienced by academics seeking for institutional support to innovate their pedagogical practices. Also, it extends research on teacher professional development by using activity systems analysis framework to analyze data and identify the tensions.

It is in a researcher’s hope that the study could contribute to an ever-expanding pedagogical landscape within the learner-centered environments. The goal of this case study was to “understand a single case” (Yamagata-Lynch, 2010, p. 78) through the lens of an activity systems analysis. ASA allowed me as a researcher to take a somewhat participant observer role providing more data about each participant.
This study contributes to the research field of the pandemic context with the faculty professional development happening online instead of the physical active learning classroom. This limitation made it practically impossible to develop an environmental competence among the training attendees. The environmental competence (Steele, 1980) means that teachers are able to effectively use the physical classroom. However, as the ALC is not a main focus for our campus, the training workshop also aimed at increasing knowledge about active learning pedagogy to be able to apply it in a traditional classroom. During the training workshop, for me it was important to transmit the active learning classroom pedagogical and social affordances to avoid the misalignment between the room design and learning outcome (Boys, 2009). Overall, professional development aimed at initiating the university-wide conversations about learning spaces and active learning.

Limitations and Delimitations

The findings of this study should be considered within the context of its limitations. First, what can be done in a single training event during one week is limited. The training lasted three days only. Following the research telling us about the benefits of having professional development delivered over time (e.g., Desimone & Garet, 2015), there was a follow-up in the form of meetings with the participants who decided to use an active learning classroom or/and integrate active learning pedagogies in their teaching.

Second, although “there is no minimum number of participants for a qualitative study” (APA 7, p. 100), it is a limitation of this study that the number of participants is small and participants were selected from one specific university. Due to the pandemic and campus access restrictions, spatial issues were not considered a priority for anyone. Therefore, the training campaign was not successful in recruiting more participants due to a lack of interest in exploring the teaching in the physical classrooms as instructors could not come and try the redesigned space until the pandemic restrictions are over. The limited number of faculty members of one institution limits the generalizability of the findings.

Third, the time limit of semester restricted opportunities to evaluate longitudinal changes in teaching practices. The data collection period occurred during September-November, 2021 and relied heavily on self-reported measures and perceptions. However, the selection of a case study design can be justified as an adequate tool to examine perceptions, beliefs, and study
participants performance changes. A data analysis limitation was that the researcher was the only data coder.

**Assumptions**

Several assumptions were made before the research study started. First, I considered the training workshop that I designed as a professional development event that will lead to alterations in teaching practices, focusing on improved learner experiences. This, therefore, would become a success indicator and could be shared with the rest of the campus community as a toolkit ready to be applied to redesign the courses when shifting the teaching from a traditional classroom to an active learning classroom. Second, I used a relatively novel analytical method – ASA – assuming that it will provide an appropriate perspective to see the process of faculty integrating active learning into their instructional practices. However, I did not anticipate all positive results.

It was also assumed that study participants are not fully aware of active learning and how active learning classrooms facilitate integration of active learning pedagogies into their teaching. It was also assumed that study participants were interested in participating in the study and would respond to the researcher's questions accurately and truthfully.

**Conclusion**

Innovations in learning spaces are believed to modernize teaching practices, thus enabling the proliferation of new pedagogies. However, campus facility development should be happening in tandem with teacher preparation. In this regard, further research on the role of the space in educational development (see, e.g., Phillipson et al., 2018) and how educational development prepares faculty to use active learning classrooms (Fraser, 2014; de la Harpe & Mason, 2014; Hall-van den Elsen & Palaskas, 2014) should be done. Any changes require proper infrastructure and resources, and instructional changes are not an exception in this regard. To increase the chances of introducing active learning, classrooms designed explicitly for this pedagogy should be available.

Adoption of new teaching methods also referred to as a teacher innovativeness (McGeown, 1980) can be conceptualized from individual and organizational perspectives.
Recently, more studies, although mainly centered around accepting technology, explore a teacher innovativeness from an organizational perspective (e.g., Chou et al., 2019). The success factor to promote teacher innovativeness is the availability of appropriate resources, including the active learning classrooms. If such spaces are considered as an essential part of the learning infrastructure and will not be regarded as a standing alone novelty, higher are the chances for their effective usage within the student-centered paradigm.
APPENDIX A

IRB APPROVAL FORM

FLORIDA STATE UNIVERSITY
OFFICE of the VICE PRESIDENT for RESEARCH

EXEMPTION DETERMINATION

August 18, 2021

Aiman Khamitova,

Dear Aiman Khamitova:

On 8/18/2021, the IRB staff reviewed the following submission:

<table>
<thead>
<tr>
<th>Type of Review:</th>
<th>Exempt</th>
</tr>
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<tr>
<td>(1) Educational settings:</td>
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</tr>
<tr>
<td>(2) No Tests, surveys, interviews, or observation (low risk)</td>
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<tr>
<td>Title:</td>
<td>Faculty Training to Support an Active Learning Classroom Usage</td>
</tr>
<tr>
<td>Investigator:</td>
<td>Aiman Khamitova</td>
</tr>
<tr>
<td>Submission ID:</td>
<td>STUDY00003518</td>
</tr>
<tr>
<td>Study ID:</td>
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<tr>
<td>Funding:</td>
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<tr>
<td>Grant ID:</td>
<td>None</td>
</tr>
<tr>
<td>IND, IDE, or IDE:</td>
<td>None</td>
</tr>
<tr>
<td>Documents Reviewed:</td>
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<td>- ctsCompletionReport172307.pdf, Category: CITI Training Completion Documentation;</td>
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<tr>
<td>- hep-502a-consent-sb-1-Aiman Khamitova.pdf, Category: Consent Form;</td>
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<td>- Recruitment emails.pdf, Category: Recruitment Materials;</td>
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<td>- Surveys.pdf, Category: Recruitment Materials;</td>
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</table>

The IRB staff determined the protocol qualifies for exemption, effective on 8/18/2021.

COVID-19 Information for Research Involving Human Subjects: Note that the U.S. is operating under the national emergency Proclamation 9994 concerning the COVID-19 pandemic and that this national emergency remains in effect until rescinded or terminated by the President of the U.S. (p.105) for the Proclamation letter). Conditions are dynamic and related policies or guidance evolve accordingly; as applicable, refer to the U.S. Centers for Disease Control and Prevention website specific for universities or refer to our COVID-19 and Human Research Studies web page to learn more about how you should or may protect persons (whether vaccinated or unvaccinated) involved in any of your in-person research activities.

Other Information:

Page 1 of 3
You are advised that any modification(s) to the protocol for this project that may alter this exemption determination must be reviewed and approved prior to implementation of the proposed modification(s).

Modifications to the research may invalidate the exemption determination (because the research no longer meets the exemption criteria described in HRP-312 – WORKSHEET – Exemption Determination).

Examples of minor changes to exempt research that would not alter the exemption determination and should therefore not be submitted to the IRB for further review include the following:

- Making administrative (formatting, grammar, spelling) revisions to the protocol, consent or recruitment materials or other study documents
- Adding or revising non-sensitive questions or non-identifiable response options to a survey, interview, focus group or other data collection instrument
- Increasing or decreasing the number of study subjects—unless adding a new study sample such as children or prisoners or adding a new source of data or records
- Making study team/personnel changes—except (1) a change in Principal Investigator (PI) or (2) a change in other study personnel for whom regulatory approval of involvement in the study must be documented for purposes of institutional policy, sponsorship or funding, or other administrative purposes (e.g., graduation or manuscript clearance; addition of non-FSU study personnel).

Examples of changes to exempt research that do require prospectively submitting a modification to the IRB before implementing changes include the following:

- Making substantive revisions or additions (e.g., change in PI; funding source; sample; source of study subjects or their data; study sites or settings; procedures, interventions or interactions with study subjects; use of any drug, device, supplement or biologic; study subjects’ time or duration spent performing or participating in study activities) to the protocol, consent or recruitment materials or other study documents
- Adding or revising sensitive questions or identifiable response options to a survey, interview, focus group or other data collection instrument
- Adding a new study sample such as children or prisoners or adding a new source of data or records
- Obtaining, using, studying, analyzing, generating, storing or maintaining identifiable information or identifiable biospecimens in addition to or in lieu of de-identified or anonymous information or specimens
- Change in study risks (e.g., impact upon study subjects; impact upon students’ opportunity to learn educational content or assessment of educators who provide instruction; any disclosure of study subjects’ responses outside of the research may place study subjects at risk of criminal or civil liability or be damaging to subjects’ financial standing, employability, educational advancement or reputation)
- Change in Principal Investigator (PI) or (for students) faculty advisor
- Any involvement of a non-FSU institution or organization
- New or change in financial interest

In conducting this protocol, you are required to follow the applicable requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the Library within the RAMP IRB system.
**APPENDIX B**

**PRE-SURVEY BEFORE THE TRAINING WORKSHOP**

<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>Please select your primary teaching role</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Professor&lt;br&gt;• Associate professor&lt;br&gt;• Assistant professor&lt;br&gt;• Postdoctoral&lt;br&gt;• Other</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>How much do you know about active learning?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• None at all&lt;br&gt;• A little&lt;br&gt;• A moderate amount&lt;br&gt;• A lot&lt;br&gt;• A great deal</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Do you currently use active learning to teach your course(s)?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Definitely not&lt;br&gt;• Probably not&lt;br&gt;• Might or might not&lt;br&gt;• Probably yes&lt;br&gt;• Definitely yes</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>What barriers inhibit your ability to use active learning in the classroom? Select all that apply.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Don’t have time to plan it&lt;br&gt;• Don’t know how to do it&lt;br&gt;• Don’t have the resources to do it&lt;br&gt;• Students won’t participate&lt;br&gt;• Loss of classroom control&lt;br&gt;• Requires use of unfamiliar technology&lt;br&gt;• Other (please specify)</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Why are you attending this training? Select all that apply.</td>
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<tr>
<td></td>
<td>• I was required to attend it&lt;br&gt;• I want to learn more about active learning&lt;br&gt;• I want to use the new classroom (6.105)&lt;br&gt;• I think it will help me become a better teacher&lt;br&gt;• I think it will lead to new career opportunities&lt;br&gt;• Other (please specify)</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>In this training we will look at how to redesign a course for active learning. What course would you like to redesign and teach in 6.105?</td>
<td>Open-ended</td>
</tr>
</tbody>
</table>
7. How well designed is the current version of the course?  
   - Well designed. There are very few things that need to be changed.  
   - Somewhat well designed. The course is okay, but I know it could be better.  
   - Not well designed. The course is in need of major changes.

8. What level of change would be needed to make it an active learning course?  
   - Major changes  
   - Minor changes  
   - No changes  
   - Not sure

9. What instructional approaches do you currently use in this course?  
   Select all that apply.  
   - Lecture  
   - Whole class discussion  
   - Small group discussion  
   - Demonstrations and simulations  
   - Hands-on activities (e.g., labs)  
   - Student presentations  
   - Other (please specify)

10. What kinds of assessments do you currently use in this course?  
    Select all that apply.  
    - Tests and quizzes  
    - Papers  
    - Presentations  
    - Journals  
    - Portfolios  
    - Individual projects  
    - Group projects  
    - Other (please specify)

11. What would you like to change about this course?  
    Select all that apply  
    - Teaching methods  
    - Student activities  
    - Course content  
    - Technology  
    - Assessment methods  
    - Not sure  
    - Nothing

12. What do you hope to learn during this training?  
    Select all that apply.  
    - How to use the technology in 6.105  
    - How to design classroom activities for 6.105  
    - How to facilitate classroom activities in 6.105  
    - How to assess active learning  
    - Other (please specify)

This is the end of the questionnaire. Thank you very much for your participation!
## APPENDIX C

### POST-SURVEY AFTER THE TRAINING WORKSHOP

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>How likely are you to recommend this Teaching in an Active Learning Classroom training to a friend or colleague?</td>
<td>Extremely unlikely • Somewhat unlikely • Neither likely nor unlikely • Somewhat likely • Extremely likely</td>
</tr>
<tr>
<td>2.</td>
<td>Has your knowledge about active learning been extended after completing the training?</td>
<td>None at all • A little • A moderate amount • A lot • A great deal</td>
</tr>
<tr>
<td>3.</td>
<td>How much has your participation in the training helped in overcoming the barriers identified prior to the training?</td>
<td>None at all • A little • A moderate amount • A lot • A great deal</td>
</tr>
<tr>
<td>4.</td>
<td>Please choose the level of agreement with the statement: “This training convinced me to incorporate active learning”</td>
<td>Strongly agree • Somewhat agree • Neither agree nor disagree • Somewhat disagree • Strongly disagree</td>
</tr>
<tr>
<td>5.</td>
<td>Please choose the level of agreement with the statement: “I plan to implement active learning strategies and techniques examined during the training”.</td>
<td>Strongly agree • Somewhat agree • Neither agree nor disagree • Somewhat disagree • Strongly disagree</td>
</tr>
<tr>
<td>6.</td>
<td>What type of support would you need to redesign your course by integrating active learning strategies and techniques?</td>
<td>Open-ended</td>
</tr>
<tr>
<td>7.</td>
<td>Please describe your experience as a participant in the training.</td>
<td>Open-ended</td>
</tr>
</tbody>
</table>
APPENDIX D

INTERVIEW PROTOCOL FOR INTERVIEWS WITH FACULTY

Statement to announce to each interviewee before the interview: "Thank you for participating in this research study. I will be audio recording this conversation due to interview facilitation and note-taking. I will be the only person to access these audio conversations. Upon completion of the study, all the audio files will be destroyed".

Questions:
1. How would you define your role as an instructor? How many courses do you teach?
2. How would you describe your teaching style?
3. What comes to your mind when you hear “active learning”?
4. In your opinion, how useful is an implementation of active learning for learning purposes? For you personally, what are the advantages of active learning?
5. What are the disadvantages, if any?
6. Do the relative advantages or disadvantages of active learning strategies prevail and why?
7. What would convince you to use active learning techniques?
8. How would you evaluate your expertise in practicing active learning pedagogy?
9. How could the use of active learning affect your role as a teacher?
10. Have you ever taught in an active learning classroom?
11. What have you learned during training that was conducted in the active learning classroom?
12. If you were to teach in 6.105 this semester, do you think your current course materials could remain unchanged?
13. As you have participated in the training, would you like to introduce (more) active learning strategies?
14. What changes would you probably plan to make to your teaching after completing this training?
15. What would be the reasons for you to introduce active learning pedagogy to your teaching?
16. What would be the reasons for you not to introduce active learning pedagogy to your teaching?
17. What active learning strategies will you likely to integrate into your course(s)? (if not covered) Why?
18. How would you integrate active learning pedagogy into your course(s)?
19. What is the most challenging part in your opinion when trying to integrate active learning strategies to your teaching?
20. Would you like to work with me individually to redesign your course(s) with active learning strategies?
21. Tell me about your experience at the training?
22. Anything else you want to add that you have not yet shared with me?

Statement to announce to every interviewee upon completion of the interview: thank you for agreeing to be interviewed within the research study. My contact information is the following: email and phone number in case there are questions or any issues. I would also like to ask for an opportunity to contact you again if there is a need for me to clarify information or ask additional questions.
REFERENCES


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Aiman Khamitova is a doctoral student of the Doctor in Education Program at Florida State University, studying Learning Design and Performance Technology at the Department of Educational Psychology & Learning Systems. She works as an Innovative learning officer at the office of the provost at Nazarbayev University (NU, Kazakhstan). She is also a part of the Transformation office led by the NU President.

Before joining higher education administration, Aiman worked as a diplomat at the Ministry of Foreign Affairs holding various positions (attaché, third secretary, second secretary).

Her research interests lie in instructional design, active learning environments, online and blended learning, and faculty development.

**Education**

Ed.D., Learning Design and Performance Technology, Florida State University, 2022

Dissertation: Faculty Training as a Tool to Support an Active Learning Classroom Usage

M.A., Journalism, Universidad Rey Juan Carlos, 2014


**Professional experience**

Nazarbayev University, Kazakhstan, 2016 – present

- Innovative Learning Officer
- Senior manager of innovative learning
- Assistant to the Provost

Ministry of Foreign Affairs, Kazakhstan, 2007-2012

- Second secretary
- Third secretary
- Attaché

Khabar Agency, Kazakhstan, 2006
Conferences

TCC Building Our Future-Movin' On! 2021, a presenter
   Paper: “The Future of Physical Learning Spaces”
15th International Conference on Mobile Learning, 2019, a presenter
   Paper: “Innovative learning hub’s role in learning space design”
AUA Online Education Conference, 2019, a presenter
   Paper: Learning spaces as an innovative teaching agent”

Memberships

AECT
SCUP