

**Cross-cultural Lessons From Remote Instruction:  
Instructional Perspectives on Pandemic and Post-lockdown College Instruction**

by

Anjli Narwani

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Doctoral Committee:

Professor Kevin Miller, Chair

Professor Kai Cortina

Professor Leslie Rupert Herrenkohl

Professor Colleen Seifert

Anjli Narwani

[anjli@umich.edu](mailto:anjli@umich.edu)

ORCID iD: 0000-0002-7617-2541

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## DEDICATION

This dissertation is dedicated to my family, mentors and educators who have shone the light to illuminate my path and inspired me to persevere in my quest for knowledge.

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## TABLE OF CONTENTS

DEDICATION	ii
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDICES	xii
ABSTRACT	xiii
<b>Chapter 1</b>	<b>1</b>
<b>Central Tenets of Models of Online Education</b>	<b>1</b>
<b>Introduction</b>	<b>1</b>
<b>Instructional Technologies and Online Education</b>	<b>2</b>
The Emergence of Learning Management Systems (LMS)	4
The Rise of MOOCs	5
Examples of Early Adopters	6
<b>Instructional Perspective on Online Courses</b>	<b>8</b>
Technology Acceptance	10
Online Instruction Adoption	11
Pre-pandemic Online Instruction	11
Instructional Design and Training	12
<b>Pandemic-Induced Remote Instruction</b>	<b>13</b>
Moving to Remote Instruction	15

Instructional Design Needs for Remote Classes	17
<b>Global Education Perspectives on ERT</b>	<b>19</b>
Perspectives on Managing Challenges	20
Learning Lessons from Instructors	22
<b>Chapter 2</b>	<b>25</b>
<b>Conceptual Model for Instructional Changes in Times of Disruption</b>	<b>25</b>
<b>Foundations of Instructional Design</b>	<b>27</b>
Constructivist perspectives	29
Cognitivist perspectives	30
<b>The Online Learning Space</b>	<b>31</b>
Characteristics of Online Class Instruction	32
Mediated Learning	32
Modality and Format	36
Additional Pedagogical Perspectives	37
<b>The Experiment of Moving Courses Online</b>	<b>40</b>
Role of Demand Characteristics	41
Lasting Effects	43
<b>Conceptualizing Instructional Changes</b>	<b>45</b>
Characteristics of Remote Instruction	46
Modality	46
Communication	46
Interaction	47
Conceptual Model for Instructional Changes	48
Benefits of using IMC	51
Scope, Assumptions and Limitations	51
<b>Chapter 3</b>	<b>54</b>
<b>Methodology to Examine Instructional Perspectives</b>	<b>54</b>

Purpose	56
Approach	57
<b>Method</b>	<b>58</b>
Objectives	59
Instrument	60
Questionnaire Design phase	63
Rationale	65
Questionnaire Design Underpinnings	70
Procedure	71
Themes In Instructional Changes	72
<b>Chapter 4</b>	<b>74</b>
<b>Colors and Shades of Instructional Perspectives</b>	<b>74</b>
<b>Cross-Cultural Study</b>	<b>76</b>
Participant Overview	76
Course Level Data	78
Instructional Changes	80
Underpinnings	81
Operationalizing Instructional Perspectives	90
Individual Instructor’s Change Perspectives	107
Life Aspects	113
Overall Results	115
<b>Chapter 5</b>	<b>117</b>
<b>Coping and Adapting: Lessons from Teaching amid a Pandemic</b>	<b>117</b>
Cross-Cultural Analysis - Outlook Towards Instructional Change	118
Tendencies Across Cultures	119
The Remote Instruction Experiment	120
Contextualized Conditions of Teaching and Living	120



Changed Instruction in Differentiated Conditions	122
Cultural Differences - Learning Centric and Teaching Centric	123
Demands on Instruction in Differentiated Conditions	126
Higher Demands on Learners Post-Adjustment	127
Lasting Change in Instruction - Incremental Improvement Was Common	128
Significance	134
Assumptions, Limitations and Future Directions	138
<b>Conclusion</b>	<b>143</b>
Cross-Cultural Story of Instructional Change	145
<b>References</b>	<b>147</b>

## LIST OF TABLES

Table 1.1. History of Instructional Technologies in Education	3
Table 1.2. University of Michigan (UofM) Course Taxonomy	17
Table 2.1 Theories of Learning	28
Table 4.1. Distribution of Instructors by Number of Courses Taught across semesters in U.S.	77
Table 4.2. Distribution of Instructors by Number of Courses Taught across semesters in China	78
Table 4.3. Course Type Distribution - across the three semesters in U.S. and China	79
Table 4.4. Course Instruction Modality Distribution - across three semesters in U.S. and China	80
Table 4.5. Thematic Analysis - Categories of Instructional Changes	82
Table 4.6. Mapping of Themes to Instructional Change Interaction Categories	84
Table 4.7. Example: Instructional Changes in analysis of an instructors' responses (China sample)	85
Table 4.8.1. U.S. and China Ingroup Interaction types and Instructional Changes	88
Table 4.8.2. U.S. and China Ratio of Instructional Change by Type to Instructors	89
Table 4.9. Definitions for Response Style Categories	111
Table 4.10. U.S. and China Instructional Change Response Styles	112
Table 4.11 Instructors Ratings about areas of life affected by pandemic	114
Table 4.12 Key Findings on Instructional Experiences	115
Table A. Dimensions for Categories for Instructional Changes	174
Table B. Coding Scheme with Examples	175
Table C. Coding Scheme with Examples	179

## LIST OF FIGURES

Figure 2.1. Simplified adaptation of Laurillard (2002) Conversational framework - At Micro Class Level	33
Figure 2.2. Conceptual Model - Interaction Modality Communication (IMC)	48
Figure 2.2.1. Conceptual Model - Interaction Modality Communication (IMC) Hypothetical Sample	50
Figure 2.2.2 Conceptual Model - Interaction Modality Communication (IMC) Hypothetical Sample continued	50
Figure 3.1. Cross-national Questionnaire Development Project - High level perspective	61
Figure 3.2. Cross-Cultural Instructor Perspectives Questionnaire Structure - Simplified Illustration	63
Figure 4.1. U.S.: Instructional Changes - Category Distribution	86
Figure 4.2. China: Instructional Changes - Category Distribution	86
Figure 4.3. U.S. and China Instructional Changes - Categories Heat Map	87
Figure 4.4. U.S. Semester 1 Hybrid Course Measures	92
Figure 4.5. U.S. Semester 1 Online Course Measures	93
Figure 4.6. U.S. Semester 2 Hybrid Course Measures	94
Figure 4.7. U.S. Semester 2 Online Course Measures	95
Figure 4.8. U.S. Semester 3 Online Course Measures	96
Figure 4.9. China Semester 1 Online Course Measures	97
Figure 4.10. China Semester 1 Hybrid Course Measures	98
Figure 4.11 China Semester 1 In-person Course Measures	99
Figure 4.12. China Semester 2 Online Course Measures	100

Figure 4.13. China Semester 2 Hybrid Course Measures	101
Figure 4.14. China Semester 2 In-person Course Measures	102
Figure 4.15. China Semester 3 Online Course Measures	103
Figure 4.16. China Semester 3 Hybrid Course Measures	104
Figure 4.17. China Semester 3 In-person Course Measures	105
Figure 4.18. China: Effort Measures between Modalities	106
Figure 4.19. China: Learning Measures between Modalities	106
Figure 4.20. Female Instructors' Change Perspectives	108
Figure 4.21. Male Instructors' Change Perspectives	108
Figure 4.22. Change Perspectives in the U.S.	109
Figure 4.23. Change Perspectives in China	110
Figure 4.24 Instructors' perspectives in China and the U.S.	113
Figure 5.1. Characterizing Course Instructional Changes: Cognitive Aspects of Course Instruction	122
Figure 5.2. Ancient Chinese Character Representing Learning	124
Figure 5.3. Simplified Depiction of Instructional Responses in ERT	132

## LIST OF APPENDICES

Appendix 1	162
Instructor Questionnaire	162
Qualitative Data Analysis - Instructional Design: Analyzing Changes	174
Appendix 2	176
Fisher’s Exact Test Results - Instructional Change Interactions Types between Cultures Comparison	176
Appendix 3	177
Comprehensive List of Variables in Dataset	177
Appendix 4	179
Instructor Questionnaire Qualitative Data Analysis - Response Styles	179

## ABSTRACT

The advent of the internet began a slow and halting movement toward online teaching and learning. As more universities and schools adopted electronic-learning (e-learning) as a formal mode of instruction, several instructional models emerged in undergraduate and graduate programs. The unexpected spread of the COVID-19 pandemic led to an unprecedented shift to online instruction across universities worldwide. Although online instruction in itself was not new, its extension to students and faculty, who had not voluntarily chosen to participate in it, was new. To what extent do existing models of online course instruction and constrained decision-making account for instructor experiences during emergency remote teaching (ERT)? In order to answer our questions we surveyed university faculty in the United States and China on their experiences of moving instruction online, and about ideas and practices they will carry over from remote instruction as the need for it recedes. When we contrasted approaches for coping and adapting instruction, we identified eight instructional change categories and four instructional response styles. We presented a model for characterizing features of instructional design and instructional response mechanisms - the Interaction Communication Modality model. Our work attempted to overcome a gap in instructional design research for categorizing and identifying multi-modality and cross-modality changes in instruction. Our findings revealed that American instructors reported making more individual adaptations as compared to instructors in China, and also that they were more likely to report that they would carry forward changes after the demands of ERT receded. Changes in each culture emphasized existing features of instruction, with Americans emphasizing dialogic or interactional instructions and the Chinese instructors emphasizing narrative instruction. Lessons we learned from instructors' experiences of remote instruction help inform educators, particularly teacher educators, educational technologists and designers of learning experiences. We hope that studying the pandemic experience of instructors will help make both instruction and our understanding of it resilient to future shocks that may arise.

## **Chapter 1**

### **Central Tenets of Models of Online Education**

The advent of the internet began a slow and halting movement toward online teaching and learning in colleges. As more universities adopted electronic-learning (e-learning) as a formal mode of instruction, several instructional models emerged in undergraduate and graduate programs.

The unexpected spread of the COVID-19 pandemic in the winter of 2020 led to a widespread and sudden shift to online instruction across universities worldwide. Although online instruction in itself was not new, its extension to students and faculty who had not voluntarily chosen to participate in it was new. The abrupt transition to online teaching and learning presents us with an opportunity to test previous scholarship on online education in colleges and to assess existing models that were developed based on the experiences of instructors who intentionally chose online instruction.

Despite being a new experience for many faculty, existing research on both online instruction and decision-making under time pressure and other constraints can help explain the challenges encountered during online college instruction amid the COVID-19 pandemic.

However, because the scale of this instructional change was unprecedented, cross-cultural

instructor experiences under these conditions can also contribute to extending our understanding of remote instruction.

Our theoretical underpinnings for this study are based on the tenets of online instructional design and models of remote teaching. The remainder of this chapter presents a review of existing research on online teaching as it applies to emergency remote teaching. After examining various issues, such as instructional design, instructor readiness, technology acceptance, and the impact of the COVID-19 pandemic, we extend these frameworks to form the foundations for a conceptual model of online instruction. That model will organize our analysis of instructors' perspectives about their experiences of remote instruction, and help us identify and characterize key features of online teaching.

The terms "instructor", "educator" and "faculty" are used interchangeably to refer to those members of higher education academia who conduct education. We use the terms "student" and "learner" synonymously. The terms "online/distance education" and "online/distance learning" are used to refer to the teaching and learning experiences when instructors and students are in separate physical locations.

### **Instructional Technologies and Online Education**

In simple terms, online education is the delivery of education through the internet. Online education has its roots in distance learning. Educators have always used technology to attempt to teach those who could not avail themselves of face-to-face instruction, beginning with correspondence courses using the mail. The earliest known reference to correspondence courses dates back to 1728, when Caleb Phillips offered shorthand lessons by means of postcards (Thorkelson, 2021).



More recognizable forms of distance learning emerged with the proliferation of the radio (Cook & Nemzek, 1939; Jamison et al., 1974). Table 1.1 summarizes the evolution of instructional technologies in K12 and adult education, in a timeline format. As illustrated in Table 1.1, educational materials were shared in the form of print, video tapes and later CDs, until access to the internet became common for distance learning. With the emergence of the internet physical distances were no longer a constraint. According to Kentnor (2021) the evolution and progression of distance education runs parallel with the innovations in communication technology. Advancements in computing and faster internet networks enabled online education to become more interactive and convenient.

Table 1.1. History of Instructional Technologies in Education

Year	K12	Adult/Higher Education
1700s		Correspondence courses use mail postcards
1800s		Sir Isaac Pitman's Correspondence College is established and Universities such as University of London in the United Kingdom and Wesleyan College, Connecticut in the US begin offering degrees at a distance
1906		University of Wisconsin-Extension founded using wireless broadcast station
1925	Radio broadcasting is used in classrooms	
1930s	Filmstrips become a popular instructional tool	
1940s	Overhead projectors are introduced	Overhead projector slides become creates a new norm for presenting work
1950s	Television is used for educational programming	Distance education for correspondence degree programs is widespread

1960s	Computer-assisted instruction (CAI) is developed	Libraries begin dedicating spaces for and investing in computing services
1970s	VCRs are introduced, enabling more widespread use of video in the classroom	PLATO computer-based learning system is developed at the University of Illinois
1980s	Personal computers become more common, and educational software begins to be developed	Apple II computer introduced in 1977, increasing access to personal computers for education by 1980s
1990s	Internet access becomes widely available, and educational websites begin to appear	LMS (Learning Management Systems) become more widely used, enabling online delivery of courses and materials for education
2000s	Smartboards and interactive whiteboards become popular in classrooms	Massive Open Online Courses (MOOCs) begin to gain popularity as a new format of online learning
2010s	Mobile devices such as smartphones and tablets become prevalent in classrooms	Virtual and augmented reality technologies become more widely used in higher education
2020s	Online learning platforms and video conferencing tools become the primary mode of education due to the COVID-19 pandemic	Artificial intelligence and machine learning begin to get integrated into educational technologies

### **The Emergence of Learning Management Systems (LMS)**

The advent of the internet led to the development of Learning Management Systems (LMS). LMSs are software applications that enable the creation, management, and delivery of learning content. LMSs allowed universities to offer online courses and degrees to students from any part of the world.

The first LMS was WebCT, created in the mid-1990s. Blackboard, another LMS system, was launched in 1999, and it quickly became the dominant player in the market. Rate of adoption of LMSs was among the main success indicators and training was seen as a facilitator (Narwani

& Arif, 2008). Universities invested not only in acquiring access to the platform but also in training their instructors and students to gain traction.

With the spread of LMSs, universities started to offer online courses and degrees to students. One of the early adopters of online education was the University of Phoenix - established in 1976 as a traditional brick-and-mortar institution. The University of Phoenix started offering online courses in 1989 and soon became the largest for-profit online university in the world, setting a model for competitors. Other universities soon followed suit, and online education began to gain popularity.

### ***The Rise of MOOCs***

Massive Open Online Courses (MOOCs) are described as online courses designed to be accessible to a large number of students. MOOCs emerged in 2011 and spread dramatically. The first MOOC was created by George Siemens and Stephen Downes, who offered a course on Connectivism and Connected Knowledge. The course was free and open to anyone who wanted to enroll. The emergence of platforms such as Coursera, EdX and Udacity pushed the movement forward. According to public data by 2015 there were some 4200 MOOCs with millions of enrollments worldwide (Shah, 2018).

MOOCs primarily offered learning to anyone with an internet connection, without the barriers of entry such as admissions and tuition fees. They were particularly attractive to people who could not afford traditional higher education or who wanted to learn for personal or professional development. MOOCs became attractive to universities because they enabled reaching out to a larger audience and offering courses to students all over the world. For example, Stanford university introduced three free online courses under the slogan of “Stanford

Online”. Each of these courses attracted hundreds of thousands of participants, sparking widespread interest in MOOCs as a new form of online learning.

### ***Examples of Early Adopters***

Many universities were early adopters of online learning. The University of Phoenix, was one of the first universities to offer online courses. Another early adopter was the University of Maryland University College (UMUC), which started offering online courses in 1993. UMUC was established in 1947 to serve the educational needs of US military personnel, and it became one of the first to offer online courses to military personnel who were serving overseas.

In the 1960s the University of Illinois created a computer-based learning system called PLATO (Programmed Logic for Automated Teaching Operations). The system was designed to help students learn through interactive lessons and assessments. While PLATO was not entirely online, it paved the way for computer-based learning. In the 1970s and 1980s, the Open University in the UK became one of the first to offer distance learning courses on a wide scale. Students could receive course materials in the mail, and could interact with tutors by phone or mail. However, the rise of the internet in the 1990s changed the landscape of online education.

The University of Illinois established its Global Campus in 2008 to offer online courses and degrees to students globally. Coupled with the launch of Coursera in 2012, and the launch of Harvard-X, by the Harvard University for degree programs on the EdX platform in the same year, these events sprung universities into a new race of digitizing their courses and programs for wider audiences. The push for online education was driven in part by the need to increase enrollments and to create equitable access to knowledge for those who otherwise could not afford it. The early adopters were the ones to set the models for online education, thereby making instructional design for online courses largely a work of replication and comparison.

While many advocate for the open access model and believe it has value for learners (Beaven et al., 2014; Siemens et al., 2020) others have contended that these courses fail to support social interactions or incorporate humanistic learning design (Haug et al., 2014; Sanchez-Gordon & Luján-Mora, 2014).

Siemens (2013) described types of MOOCs using attributes of communication features, in order to address the concerns from a socio-constructivist perspective. MOOCs were classified as cMOOCs, xMOOCs, quasi-MOOCs where the prefix 'c' is for connective and 'x' for extended. He characterized cMOOCs as those reflecting creativity, autonomy and social network learning and xMOOCs as those approaching learning from a more traditional perspective, extending into online formats with video lectures, quizzes for testing. These classifications help distinguish the role of the instructor, learner and interactivity in the contexts of MOOCs. Along with open-access MOOCs, several institutions gave for-credit online education.

The proliferation of online education and platforms such as Coursera and EdX raised important questions and concerns around how we could measure effectiveness in online instruction in different contexts. What indicators of quality learning and best practices could help course designers and educators make decisions about instructional design? For example: How are course completion and engagement related? What features of online instructional design promote learning?

While there is a large body of research available on student perceptions of online education, there is less knowledge about the perspectives of instructors. Because college instructors are the ones mainly responsible for how their courses are delivered, it is important for us to understand their perspectives around online instruction.

## **Instructional Perspective on Online Courses**

Technological advances provide opportunities for instructors to engage students in ways different from traditional face-to-face instruction. Digital communication tools enable instructors to present multimedia learning materials to students, while also interacting with them in ways to collect and record feedback in real-time; which can enable instructors to better monitor and evaluate student engagement. For instance, audience response systems universally known as “clickers” are commonly used in face-to-face classrooms to gauge students' understanding by collecting their responses to question/quiz/poll prompts. Similarly, in online courses, in-video prompts can serve the same purpose by collecting responses while students are engaged with instructional materials. Although collecting student responses and prompting them for reflections in real-time can enhance the way we inform instructional improvements, incorporating these features in either format requires significant effort in planning and design.

The process of moving courses from face-to-face to online formats relies heavily on the instructor and (where available) an instructional design team. Reflections from faculty members inform much of the discussions around what constitutes the work involved in migrating from conventional teaching to online courses. Chiasson et al. (2015) identified planning, implementation, and reflection as the main themes that emerged from faculty reflections about their experiences moving courses from in-person to online at a Midwestern American University. According to them, from an instructional design perspective success in developing online courses is contingent on the following affordances:

1. When planning, faculty could spend ample time with an instructional designer learning the technologies to support their self-identified pedagogy; Additionally, compensation for course development was perceived as necessary.

2. While implementing their online course, the faculty's conceptual framework was their prior in-person course; interestingly, for those who delivered it synchronously, online did not require different instructional tools like it did asynchronously.
3. While reimagining course instruction faculty were aware of and could reflect on their role shifting to being a facilitator.

Kim and Bonk (2006) surveyed members of the Multimedia Educational Resource for Learning and Online Teaching (MERLOT) and the Western Cooperative for Educational Telecommunications (WCET); both premier associations for online education. They identified ten competency development areas for online instructor readiness: 1. Course Developer, 2. Facilitator, 3. Moderator, 4. Subject Matter Expert, 5. Instructor or Lecturer, 6. Student Counselor 7. Advisor, 8. Technology Trainer, 9. Program Coordinator and 10. Developer. The range of competencies illustrates the complexity of roles involved in online instruction.

The instructional effort investment required might differ depending on the course design, number of students in a class section and the degree of technology integration. Specific examples are needed of how the instructional effort required for online teaching might vary depending on factors such as course design, number of students, and level of technology integration.

When classes use technology-mediated communication for remote instruction such as video conferencing (eg. Zoom), instructional effort might be different compared to when online software tools (eg. Canvas) are employed to deliver multimedia content to students. For example, some research found synchronous videoconferencing can be more challenging to facilitate than asynchronous online discussions, particularly in terms of managing group interactions and engagement (Lowenthal et al., 2020; Lowenthal et al., 2021). Another example are prerecorded video lectures, where instructional effort is heavily concentrated around planning, design and

developing the course materials. Several factors affect decisions around using technology tools in teaching. Because instructors have a lot of agency to decide how they teach it begets asking what factors influence how they make their choices.

### **Technology Acceptance**

Smith and Sivo (2012) examined how the Technology Acceptance Model (TAM) could predict the intentions of teachers to continue using e-learning after a professional development using the same tools. TAM was developed by Davis (1989) as a theoretical model to determine an individual's acceptance and behavioral intent to use a technologically based system mediated by two major variables: (1) perceived usefulness (PU) and (2) perceived ease of use (PEU). Here, PU is defined as how individuals perceive using a system will enhance their productivity or performance, and PEU is defined as the degree, they perceive, a new technology will require minimal effort. Teo (2011) found that PU, PEU, and a third factor he termed "subjective-norm" were significant predictors of pre-service teachers' intentions to use educational technology in their future classrooms. Subjective-norm is the net effect of social influence on primary mediating factors of perceived usefulness and ease of use. For example, when a group of pre-service teachers agreed with the usefulness of a tool, it resulted in influencing others' to adopt it too.

Although Smith and Sivo (2012) identified another mediating factor as Social presence (SP) - the perception of other participants in online contexts as being physical or real, PU and PEU were most significant in predicting continued use of technology in instruction. According to Narwani and Arif (2008) mediating factors (PU and PEU) might be a function of institution-level support and resources, such as training to adapt instruction using technology. Additionally, Teo et al. (2015) found that facilitating conditions, defined as the availability of support and assistance



given to teachers to integrate technology, were significant predictors of in-service teachers' intentions to use technology in their teaching practices. Providing training and support for instructors to use new educational technologies can improve their confidence and willingness to use these tools in their teaching (Teo, 2011; Chen and Chen, 2015).

### **Online Instruction Adoption**

While there is a wealth of knowledge on engagement and instructional design in the literature, most of it is situated in contexts that are very different from the disruptions to higher education that we experienced globally during the COVID-19 pandemic. As a result, there is a gap in our understanding of how instructors experienced change.

Disruption refers to the process whereby traditional educational models are challenged and potentially replaced by nuanced innovative approaches, mostly prompted by advancements in technology, pedagogy, and business models to provide more accessible, affordable, and relevant educational experiences for students.

### ***Pre-pandemic Online Instruction***

A surge of open courseware drove much of the literature examining online course design and instruction in multiple directions (Giannakos et al., 2013; Guardia et al., 2013; Siemens, 2013; Wang et al., 2018). To draw upon research situated in the context of online on-demand self-paced courses, we must also acknowledge the salient differences between an online course, meant to be taken to earn credit towards a degree, and a MOOC course, designed for open subscription. For example, Reich and RUIPÉREZ-VALIENTE (2019) conducted a systematic review of MOOC research and found that MOOCs typically have lower completion rates and higher attrition rates than credit-bearing online courses. Motivation for both instructors and students are associated with entirely different goals in these two settings. In a third type, wherein instructors

self-select to move their course(s) online, the reports of such online course delivery carefully compare (a) learning outcomes and (b) teaching effectiveness with these measures in courses delivered face-to-face (Anderson et al., 2005; Galyon et al., 2016; Kulkarni et al., 2015; Utts et al., 2003).

In any of these conditions, the design of instruction is differentiated from face-to-face instruction because of the differentiated modality and conditions. Consequently, it is important to consider factors affecting student engagement from a design perspective. In the absence of other people, as in the traditional classroom setting, how do online learners engage in learning?

### ***Instructional Design and Training***

The absence of in-person face-to-face instruction that characterizes online teaching and learning changes the way that learners interact with the material to be learned. The instructional material may be delivered in real-time in the form of live videos, or as pre-recorded videos and interactive multimedia content delivered over an online learning platform. The platform's features such as on-screen audio/video controls, buttons, navigation, static graphic, motion graphic, and textual media are referred to as widgets. These features and functions of the learning platform and of the instructional content itself impose demands on the individual learner's cognitive processing. In addition to what is on their screen, their learning environment, made up of their physical space, internet and devices, factors into how learners experience instructional material presented to them. Moreover, any number of other distractions such as mobile phones, email, or other people in the background of their learning environment might influence how deeply learners are able to engage with the online content.

The recognition that distractions and cognitive load can affect learners' ability to engage with online content, calls for much more guidance and a nuanced approach on how instructors

can design effective online learning experiences to account for these factors. Some research has suggested that strategies such as using multimedia and interactive activities, providing clear learning objectives and feedback, and fostering social presence and community can help promote engagement and learning in online courses (Anderson et al., 2001; Swan, 2002; Wang et al., 2021).

A number of studies and reports can serve as guides for the *planned* transitions of courses from in-person to online. This includes applied research about instructional design, training, support and effectiveness (Chiasson et al., 2015; Kim & Bonk, 2006; Smith & Sivo, 2012), and handbook-style collective knowledge presented by Anderson (2003). Instructional decisions about matters such as engagement, pedagogy, course design, assessments and instructor training are complex and highly subjective, requiring cognizance of discipline, audience, learning outcomes, program level, program goals and institutional quality metrics.

An entire field of study, namely learning experience design has emerged around the design of online learning environments where the complex processes of teaching and learning are mediated by technology. There is another wing of research aimed at technology acceptance (Tondeur et al., 2017; Smith & Sivo, 2012), which in turn connects to online instructional effectiveness. All this knowledge is vital, however it is mostly applicable when institutions and instructors plan, and can manage the changes involved in moving their courses online. There is a gap in our knowledge about instructional changes under suboptimal conditions wherein tools, training, support and decision making are constrained.

### **Pandemic-Induced Remote Instruction**

By definition, distance education is characterized by the distance in time and/or space between learners and learning resources, while remote education refers to spatial distance,

distance education considers distance within the perspective of different angles and strives to explain it through transactional distance (Bozkurt and Sharma, 2020). Using a change management lens, Hodges et al. (2020) distinguished teaching classes online under normal circumstances from emergency remote teaching (ERT). ERT is defined by Hodges et al. (2020) as a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances. Course redesign and careful consideration of different decisions have an impact on the quality of the instruction; and a careful design process is absent in most cases in these emergency shifts according to Hodges et al. (2020). What factors take precedence in the instructional decision making processes?

Moore and Hill (2020) illustrated a progression of higher education's response to the pandemic across four phases of online learning adoption - phase 1: Rapid transition to remote teaching and learning, phase 2: Re-adding basics (to ERT), phase 3: Extended transition during continued turmoil and phase 4: Emerging new normal; wherein the early ERT phases might not demonstrate indicators of robust education simply because of the emergency and not because of online modality. Bozkurt and Sharma (2020) raise some pertinent questions for educators and policymakers to identify recommendations to support effective online learning during and after the pandemic. For example, they call attention to the changing visions and narratives as we continue to navigate the complex landscape of online education.

Some experts have presented alternative approaches to instructional design under *suboptimal* conditions, such as during the pandemic. Quintana et al. (2021) proposed a framework for Resilient Design for Learning (RDL) under ERT conditions, building upon three guiding principles: designing for extensibility, designing for flexibility, and designing for redundancy. Cooper (2021) names the importance of prior guidance for remote teaching and

access to instructional and technological resources, including training, to help faculty manage ERT during the abrupt change at a North Carolina Community College. When looking at ERT from a macro level of the institution we know one needed ingredient in the process is making faculty feel well supported in moving their course instruction online. The second ingredient is where we recognize the need for complex decision making - bridging instructional priorities, rooted in teaching philosophy and pedagogy, with technology.

Under ERT, instructional changes might be constrained by limitations of the mediating technology. For example, in classes using Zoom for video conferencing, although it is possible for many students to be logged in at the same time, it is challenging for a single instructor to be able to scroll the gallery view on a Zoom screen in order to see all the students. Because of the limited number of people one can pay attention to, in parallel on Zoom, in some conditions the better option for an instructor to manage discussions is to group students into breakout rooms.

While these studies help us gain some insights into the technical dimensions of online instruction during ERT, we lack a deeper understanding of instructional perspectives. To understand and uncover the most significant ingredients to create effective online learning spaces requires a phenomenological inquiry about instructor perspectives around their experiences of pandemic-induced online ERT.

### **Moving to Remote Instruction**

The moment we observe during the pandemic is one where instructors had to transition instruction to online modality, abruptly. Our study is uniquely positioned to observe the shock experienced by instructors, phenomenologically and learn from their perspectives about online technology adoption and moving to online instruction as it unfolded.

In Western discourse on moving courses online during the pandemic, we find instructional experiences framed by a perspective of management - crisis management, faculty readiness, institutional supports, effectiveness and governance. For example, Cutri et al. (2020) reported on faculty readiness by means of a mixed methods study, to inform professional development designers, in other words institutional training. They called attention to needs for (a) students' equitable access to online learning and (b) managing demands of scholarship and academic community service duties.

Cameron-Standerford et al. (2020) conducted a mixed methods study at a Midwestern U.S. University. They elicited the importance of the role of institutional supports, such as training and technical support, from faculty reflections about moving online in the context of COVID-19 circumstances. Bartlett et al. (2020) studied how the institutional supports for faculty transitioning online were effective and necessary for the success of course transitions at North Carolina State University in the U.S. It is important to mention, support resources and training do not come in a one-size-fits-all. In order to be effective, institutional support and training need to be tailored to the unique needs of instructors and instructional design. The types of instructional changes and adjustments, to be supported by training and resources, is as diverse as the types of courses, instruction, disciplines and institutions.

The Technological Pedagogical and Content Knowledge (TPACK) framework provides a structure for considering the needs for instructor training and instructional design in online courses. It identifies three types of knowledge (technological, pedagogical and content) instructors need to select and combine technology (hardware and software) appropriate for their course needs. We zoom in on the layer of *instructional design needs* for our inquiry of

instructional experiences of remote instruction and decision making around college level instructional changes and choices.

***Instructional Design Needs for Remote Classes***

College level instruction is not monolithic. There exist a myriad of instructional design choices and decisions underneath what shows up as an undergraduate or graduate level course. Course types range from didactic lectures to seminars and discussions. The diverse range of course types in an online context present different demands on both technology and instructors. For example, the taxonomy of courses at the University of Michigan, Ann Arbor (UofM) (Table 1.2) illustrates the diverse nature of courses. The role of instructor and instructional material differ across these types of courses, thereby raising the issue of the underlying range of instructional design decisions needed to effectively transition course instruction to online.

Table 1.2. University of Michigan (UofM) Course Taxonomy

UofM Course Type	UofM Course description
Discussion	Two-way communication usually relating to the contents of a lecture
Individual Instruction	Independent study with individual consultation and guidance from instructor
Lecture	Primarily one-way communication of prepared discourse from instructor to students
Seminar	Students prepare materials and lead discussion under instructor's guidance
Recitation	Instructor prepares subject matter and leads students in a joint examination thereof. Not supplemental to lectures
Laboratory	Instructor supervises investigations by the class
Personalized System of Instruction	No formal lectures, mastery-oriented, student-proctored, self-paced system with printed study guides. It is also known as the Keller Plan

A lecture course might need more instructional effort in planning as well as in delivering adapted instructional materials online, particularly when featuring real-time video-conferencing class sessions; while a seminar course, typically dominated by conversations between instructors and students to drive engagement, might need more energy focused on managing multi-way interactions between participants online. A case study of a seminar style course at UofM by Narwani et al. (2020) described technology-mediated educator strategies, to create and maintain student engagement in unfamiliar remote teaching settings, by using a mix of whole group, small group discussions and digital boards.

In the case of a laboratory type course, to move to remote instruction might require a complete makeover. Gal and Israel-Fishelson (2020) presented a case of effectively engaging undergraduate students with asynchronous instruction in a Workshop style course at the Holon Institute of Technology in Israel, by turning it into an asynchronous computer-mediated workshop consisting of short learning segments.

Each of these reports concern single institutional settings but collectively give a sense of the intricate and diverse approaches by instructors employed in response to the demands of ERT. We elucidate some of the characteristics of instructional design for shifting to remote instruction: (1) reimagining course materials and learning activities, (2) pre-empting challenges of remote connectivity, (3) featuring multimedia learning materials depending on the type of course, (4) compensating for the technical challenges and limitations in students' access to resources, (5) enabling accommodations for students because of their challenging life circumstances. The context of these reports are primarily set in Western education; extending our perspective cross-culturally is likely to show greater diversity of responses and perhaps identify a more robust set of common features.



## **Global Education Perspectives on ERT**

Disruptions in higher education were experienced globally at the onset of the pandemic, and according to Gallagher and Palmer (2020) online learning became the default. Although the majority of institutions shifted to ERT as the alternative course delivery method in response to the crisis, the duration and types of responses by institutions varied significantly. We consider some global narratives around the perceptions of instruction and student engagement.

Institutions in the U.S. and China assessed the effectiveness of moving their classes from an in-person format to an online modality, typically by contrasting satisfaction ratings and learning outcomes. Hamlen (2020) reported on a study at Cleveland State University in the U.S. finding no significant difference in engagement and learning scores between students who took the course in 2019 (pre-pandemic) and those who took it in 2020 (amid pandemic), suggesting the positive pedagogical practices adopted for remote teaching were effective. It is important to factor in modified priorities when we evaluate instructional effectiveness under ERT conditions online. Moore and Hill (2020) studied some reasons for ineffective online learning experiences and attributed many of the failed attempts at online instruction to a dynamic wherein instructional resistance led instructors to change teaching in ways that led to unaccomplished learning outcomes in a kind of self-fulfilling prophecy. A common theme across these reports was how educators can create meaningful and effective online learning experiences for their students by focusing on individual needs. Creating opportunities for desired learning outcomes is seen as the responsibility of the instructor in Western college contexts, along with the idea that students will differ a great deal in their needs as well as their technological resources and resourcefulness.

Non-Western reports on perceptions of student engagement diverge from the Western narratives in terms of goals as well as where the responsibility for achieving them lies. In many ways, differences in narratives between Western and Non-Western institutions reflect different views of the nature and role of students rooted in cultural contexts. A study by Hidayat and Wibawa (2020) in Indonesia reported lack of student motivation and interest in learning as a result of their inability to build collaborative learning spaces.

Bahasoan et al. (2020) who studied effectiveness of the online learning system at the University of West Sulawesi, Indonesia reported students who found online lectures ineffective or inefficient during the pandemic, were unprepared to attend lectures online and needed time to adjust. Huang et al. (2020) reported on the perceptions of first and second year Chinese students studying English under ERT conditions, attributing the successful accomplishment of learning goals to students' extrinsic goal orientation, not differing from their face-to-face learning experience. These studies in China and Indonesia, reported perceived effectiveness, or its lack thereof, as a function of student collaboration. In contrast to Western narratives wherein the instructor is framed as the mediator of challenges in learning experiences, the onus is shifted directly onto students in some of the non-western reports, where student motivation and on-task engagement are seen as predictors of successful learning outcomes.

### **Perspectives on Managing Challenges**

ERT presented many challenges for instructors, technology and students. The global reports described here unequivocally emphasized challenges of individual variation in connectivity and access to technological resources, as well as students' needs for empathetic and collaborative learning spaces. However, in the context of non-western settings, to manage these challenges is seen as the responsibility of students, unlike in Western instruction. How far do

instructional responses to challenges reflect cultural contexts? What other factors influenced the ways instructors responded to the demands of ERT? What evaluative criteria and measures influence their perceptions about instructional changes? What are some of the predictors of their outlook towards the future of online instruction?

Although there are a number of studies on the disruption in education, much of the knowledge we have about managing change and predicting instructional choices are from studies in pre-pandemic settings. For example, in order to use the TAM model to predict instructional changes in circumstances of ERT, we need to study the continued use of technology-mediated changes after the need for ERT recedes. Moreover, there is a gap in existing literature about what factors influenced instructional changes and what criteria informed instructional choices in the context of pandemic-induced ERT cross-culturally.

The process of instructional design for online course delivery is effortful, and as named by Chiasson et al. (2015), planning was the most significant predictor of satisfaction among instructors who experienced moving their courses to online formats. In addition to design and content decisions, instructors make choices around the multiple roles they might need to take upon themselves.

In order to support their online classes, instructors could switch between a range of roles spread across different competency areas (Kim & Bonk, 2006). Effective online course design and a smooth move to remote instruction requires many things, chief among them being instructional design guidelines, planning and testing, and training and support. Such resources were not at the disposal of instructors in the midst of the pandemic crisis. The abrupt changes experienced by higher education to cope with demands of the pandemic-induced ERT was akin to a large-scale global intervention altering the familiar conditions of teaching and learning.

## **Learning Lessons from Instructors**

In previous disruptions in higher education – for example with the development of MOOCs – universities in the U.S. responded in diverse ways, ranging from embracing technological innovations and online learning, to redefining their value proposition and reimagining the role of faculty in the learning process, to ignoring them completely. For example, prestigious institutions such as Harvard and MIT collaborated with platforms such as EdX to deliver online degree programs online. Some institutions were cautious in embracing technological innovations, citing concerns about the quality of online education, faculty roles and job security, and the need for human connection and social interactions in the learning process. Some focused on building a strong brand and reputation, emphasizing the value of a traditional campus-based education. While the range of institutional responses to the pandemic-induced need for remote instruction may reflect some of these characteristics, the much broader impact of the global pandemic across all aspects of life made ERT complex to manage at an instructional level.

ERT put premiums on the malleability of course instruction and resilience of learning. As an intervention, ERT falls squarely within the “quasi-experimental” tradition. Quasi-experiments differ from true experiments typically by an inability to randomly assign participants to conditions. That was certainly true in this case - the circumstances of the pandemic and institutional resources largely determined the conditions of teaching and learning. The option to be in a control group would certainly have been very popular among both instructors and students, were it only possible. Leadership of nations, universities, and departments were certainly important factors, but ones that could not be varied experimentally. It is important to be clear on the ways in which ERT does not fit the model of a classic experiment, which limits the

ability to draw any causal conclusions. Finally, the development of surveys and observations were done quickly and in some cases retrospectively, which is far from the open science ideal of a pre-registered study design.

At the same time, unique features of ERT provide valuable evidence that would be difficult to gather otherwise. Studies of online instruction have generally used motivated and expert volunteers as instructors, raising questions about what might happen were this extended to a broader sample of instructors, and ERT addresses this question. The necessity of making quick adjustments on a broad scale to the circumstances of teaching and learning is a difficult situation to simulate, so ERT provides data that will be useful in planning for similar future disruptions should they occur.

Our focus is on cross-cultural instructional changes and the most profound factors influencing choices in instructional design under disruptive conditions. To ignore the impact of the pandemic on other aspects would be an oversimplification of the complex task instructors faced. Not being reductive of social factors, in terms of group decision making processes and trickle down effects of policies at institutional or program levels, in our present study we focus our inquiry on instructional changes at individual course levels from the perspective of instructional needs. At the course level, instructional changes, albeit subject to institutional supports such as training, are directed by faculty and their decisions, anchored in their individual teaching philosophy. On one hand, extending existing models, such as TAM could help predict the intention and use of technology in teaching. On the other hand, the needs for ERT presented instructors with unprecedented conditions. We must strive to understand instructional choices as these could stem from any combination of a range of different factors and priorities in the

decision making process. The dynamics of change and resulting instructional choices made by faculty are in the foreground of our study.

In the next chapter we lay out the theoretical underpinnings to guide our work and develop a conceptual model informed by the central tenets learned from our background literature review about issues related to instructional design, instructor readiness, technology acceptance, and the impact of the COVID-19 pandemic on instruction.

## **Chapter 2**

### **Conceptual Model for Instructional Changes in Times of Disruption**

Decades of scholarship in online education enabled the development of models for online course design. Research on online learning experiences, more commonly referred to as e-learning, can be broadly categorized into five areas: cognition and instruction, learning quality, instructional design, change management and instructional technology interface.

Success factors of an e-learning course are different from those in a traditional learning environment (Teo, 2011, p 125). Central tenets of online course design include: (a) teaching and learning occur amidst conversations mediated by digital technology (b) engagement is seen as a key to effective learning and so online instructional features must promote engagement, (c) instructors are seen as primarily responsible for course content, (d) online course planning and design is an effortful process and (e) instructional designers are seen as a key resource in online course development.

The role of technology in college education has varied. The combination of computing and the internet made the possibility of remote learning a reality. But this in turn raised new questions and concerns around instructional changes, slowing the spread of online education, relative to the pace of technological advancements and innovations, for example high speed networks and video conferencing capabilities.

The disruption in higher education arising from the COVID-19 pandemic forced colleges globally to move instruction online. Disruption here refers to a process whereby traditional

educational models are challenged and potentially replaced by new and innovative approaches involving technology, pedagogy and business models. Hodges et al. (2020) define Emergency Remote Teaching (ERT) as an alternative delivery method for education in crisis circumstances, such as those under the pandemic. ERT is not the same as *planned* online instruction. Although there are some prior models of instructional change in response to other disruptions, such as Massive Open Online Courses (MOOCs), because of the unprecedented conditions of ERT, those do not adequately represent instructional perspectives.

The abrupt changes experienced by higher education to cope with demands of the pandemic-induced ERT was akin to a large-scale global experiment. Although disruption in colleges was experienced globally, institutional and instructional responses differed widely in different contexts. The degree and duration of the disruption also varied at the beginning of the pandemic (pandemic-onset), during global lockdowns (mid-pandemic) and after lockdowns were lifted in many places (post-lockdown). For example, there were differences in terms of when colleges started online classes and they returned to on-campus classes. Literature on dynamics of change, models of technology acceptance, decision-making under constrained conditions, and theories of demand characteristics can be used to examine instructors' responses to the pandemic-induced remote instruction.

Comprehending the breadth of implications of ERT requires an examination of instructor experiences. We seek to honor the voice of instructors by studying individual college instructor experiences of remote instruction. Because those experiences depend on institutional resources, structures, and contexts, we will compare instructors' responses in two cultures. In the first part of the chapter we delve into select relevant frameworks for perspectives on examining instructional change before developing the model that guided this study.



Teaching is essentially a conversation among teachers and students. Since online instruction disrupts the conventions of the traditional conversational approach, we chose the Laurillard (2002) Conversational framework, rooted in Vygotskian principles highlighting the conversational aspect of teaching. Online instructional changes can be described in terms of how instructional conversations are disrupted or modified as instructional modality changes.

In the remainder of the chapter we develop a conceptual model, to help represent and analyze (a) some changes in college instruction and (b) some differences across cultures in the pandemic-onset, mid-pandemic and post-lockdown periods. In order to lay out the foundations for a conceptual model to represent change in instruction, we begin by reviewing principles of instructional design and prior knowledge around the role of instructional technology from a learning scientist's perspective.

The terms “instructor”, “educator” and “faculty” are used interchangeably to refer to those members of higher education academia who conduct education. We use the terms “student” and “learner” synonymously. The terms “online/distance education” and “online/distance learning” are used to refer to the teaching and learning experiences when instructors and students are in separate physical locations.

### **Foundations of Instructional Design**

Analysis, Design, Development, Implementation, and Evaluation (ADDIE) is a widely used instructional design model that can be applied to online education as well. It provides a systematic approach to instructional design, guiding educators through the process of analyzing learning needs, designing instructional materials, developing online courses, implementing them, and evaluating their effectiveness (Branch, 2009).

Robert Gagné, a prominent figure in the field of instructional design during the 1960s-1980s, developed a model of instructional design known as the "Events of Instruction" to help identify the specific steps for designing effective instruction. Gagné also introduced the idea of *conditions of learning* to identify the environmental and internal factors affecting learning. His work influenced the development of computer-based instruction and e-learning (Chyung, 2008).

Instructional design, as a process for translating instructional needs into learning design, is underpinned by theories of learning. Theories of learning can be broadly categorized into five distinct groups as depicted in Table 2.1 below.

Table 2.1 Theories of Learning

Theory Category (and prominent theorists)	Learning Mechanisms	Instructional Principles
Behaviorism (B.F. Skinner, J.B. Watson, I.P. Pavlov, E. Thorndike)	Classical Conditioning, Operant Conditioning	Instruction focuses on eliciting desired observable behavior by means of stimuli-response observation and intervention
Constructivism (J. Dewey, J. Piaget, L. Vygotsky)	Assimilation, Accommodation, Equilibrium	Instruction focuses on the mind and conceptualizes knowledge as building blocks; and socio-constructivism focuses on making learning personal along with being social and motivation driven
Cognitivism (U. Neisser, J. Bruner, G.A. Miller, N. Chomsky, J.H. Flavell)	Executive function (Attention, Self-Control), Memory (Encoding, Accessing, Retrieving), Problem solving, perception, Language use, Decision Making, Meta Cognition	Instruction focuses on mediating mental processes to support the learning mechanisms and Metacognition: Monitoring (recognize, self-evaluate), Regulating (organize, adapt, self-regulate) and Attention (perception, sensing, self-awareness)

Socio-Cultural (L. Vygotsky, A. Bandura, J. Greenberg)	Mediated Learning, Zone of proximal development, Social Interactions, Funds of Knowledge	Instruction focuses on opportunities for Mediated Learning including Collaborative Learning, Reciprocal Teaching, Situated Learning
Critical Socio-Cultural (C. Lewis, P. E. Enciso, E. Moje)	Critical stance on socio-cultural learning including Contextualization and Authentic learning	Instruction focuses on adding a Critical stance on top of Socio-Cultural principles and strategies, such as Problem posing, Liberating learning and Humanizing learning

Each approach differs in its characterization of learning mechanisms, thereby informing different instructional design principles and strategies. Foundations of instructional design approaches focused on mediating instruction using digital technology are grounded in the works of earlier educational theorists, particularly constructivism and cognitivism.

### **Constructivist perspectives**

Constructivist and socio-constructivist perspectives have a significant influence on approaches to instructional design for online learning. Benjamin Bloom was a key educational researcher during the 1950s-1980s, who introduced "Bloom's Taxonomy", used widely to categorize educational goals and objectives. Bloom also researched the impact of tutoring on student achievement and developed the concept of *mastery learning*. Bloom's most significant works include "Taxonomy of Educational Objectives" (1956) and "Mastery Learning" (1971). His work has had a lasting impact on education and has influenced the development of personalized learning.

Lev Vygotsky, a renowned psychologist and educator, developed the Sociocultural Learning Theory, during the 1920s-1930s. According to Mahn (2014), while the "Zone of Proximal Development" has been Vygotsky's most cited work, the concept of mediated learning

he developed was equally as profound. He emphasized the importance of social interaction and cultural context in learning. Vygotsky's work has had a significant impact on constructivist theories of learning and the development of collaborative learning environments.

Seymour Papert was a leading figure in the field of educational technology during the 1960s-2000s. He developed the *Constructionist Theory* of learning centered around the importance of hands-on, experiential learning and the use of technology to create and explore. His most influential works include "Mindstorms" (1980) and "The Children's Machine" (1993).

The overarching themes from the works of most prominent instructional technology researchers and founders of theories have had a significant impact on the field of online learning. Some considerations for instructional design are: (a) thinking and conversation are both contributors to engagement, (b) instruction should go beyond transfer of knowledge to prompt creativity and exploration, (c) meaning-making is collaborative and an ongoing journey, (d) the process of learning occurs by building and altering predispositions or prior knowledge and (e) individual learners have individual learning needs. While these are undoubtedly core elements of the learning experience, we must also take into account cognitive aspects in online environments.

### **Cognitivist perspectives**

Cognitive psychology experts have provided valuable insights into the field of online instruction, for example on how cognitive processes influence the acquisition, processing, and retention of information in online educational environments. According to Mayer's *Cognitive Theory of Multimedia Learning*, effective online instruction should align with cognitive processes such as attention, perception, and memory to optimize learning outcomes (Mayer, 2002). The theory emphasizes the use of multimedia elements, such as visuals and narration, to enhance learning and foster meaningful engagement in online learning environments.

A cognitive process that may be particularly implicated in online learning is *metacognition*. Metacognition refers to learners' ability to monitor and regulate their own cognitive processes, such as planning, monitoring, and evaluating their learning. Online learners need to develop metacognitive skills to self-regulate their learning process, set goals, and reflect on their own learning progress (Veenman et al., 2006), and online instruction needs to support it.

The *cognitive load theory*, proposed by Sweller (1994), suggests online instruction should be designed to minimize cognitive load by managing the amount and complexity of information presented to learners. Considerations include (a) providing clear and organized content, reducing extraneous information, and (b) providing guidance to help learners manage cognitive load in online learning environments.

These perspectives from cognitive psychology experts provide important insights for designing effective online learning experiences that optimize cognitive processes and promote meaningful learning. By considering principles such as active engagement, metacognition, and cognitive load, online instructors can enable instructional strategies and environments to create optimal online learning experiences for learners. Sensory stimulation, or the lack thereof can have significant effects on the learning experience. Moreover, combining constructivist and cognitivist perspectives can only help strengthen our understanding of instructional design. To examine the cognitive aspects of instruction in the context of ERT let us unpack the dimensions of online learning spaces.

### **The Online Learning Space**

The online learning space is complex, with multiple layers that interact in ways that make it difficult to evaluate each one separately. To effectively examine instructional changes during online ERT, we must focus on communication among teachers and students that are mediated by

digital technology. Class interactions may differ depending on how communication is facilitated by different technologies. We can categorize these interactions by extending the Laurillard (2002) Conversational framework (2002), rooted in Vygotskian concepts of mediated learning.

### **Characteristics of Online Class Instruction**

“By giving our students practice in talking with others, we give them frames for thinking on their own.” - Lev Vygotsky and Cole (1978).

Using the Laurillard Conversational framework (2002), we can examine the online learning space from two perspectives. The first is the micro context of instruction, where direct communication between teacher and student translates into mediated learning. The second perspective is the relatively macro context of the learning environment level, featuring intraclass peer-to-peer interactions, enabling analysis of the aspects of the learning community in an online space.

We focus on the micro level in the context of a class to closely observe the layer where instructional decisions, practices and changes directly impact student engagement. Figure 2.1 depicts the multi-directional interactions shaping the learning space at the instructional level. For example, as shown in Figure 2.1, at micro level teacher conceptions are manifested in the constructed instructional environment, mediated by task goals and reflection of learners.

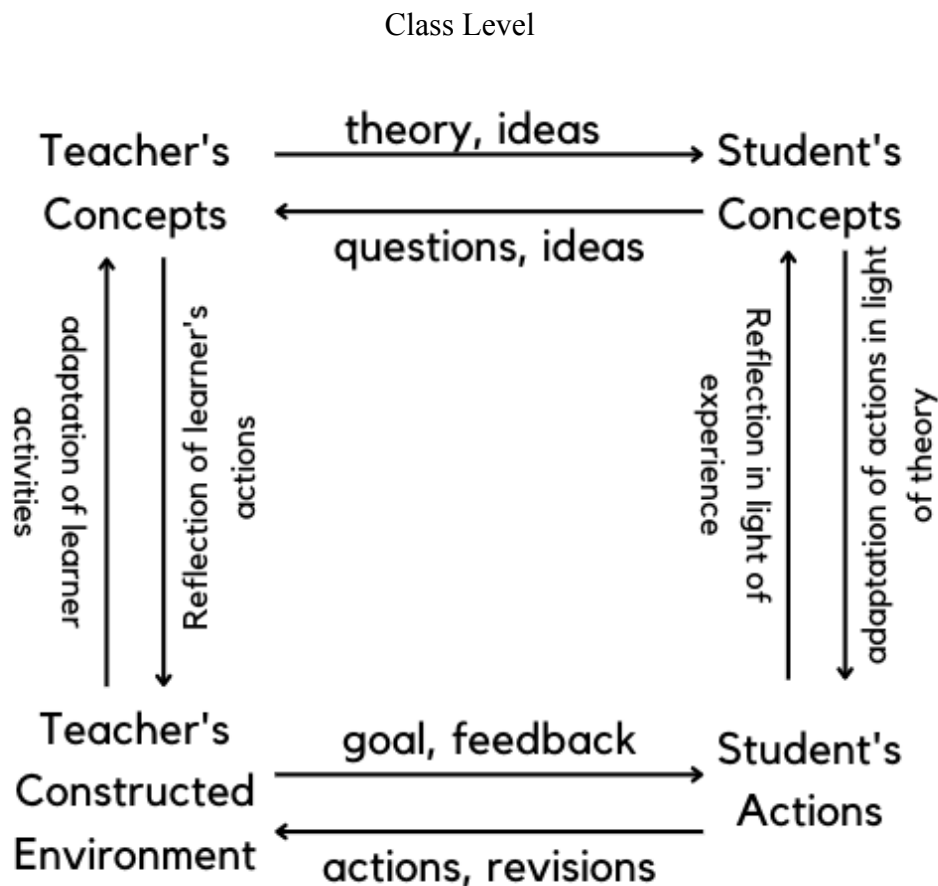
### ***Mediated Learning***

In order to comprehend the relation between conversational interactions and instructional changes, we need to examine the objectives of the named interactions shown in Figure 2.1. The conversational framework (Laurillard, 2002) evolved from Laurillard's earlier work on the Conversational Model of Learning, which emphasized the importance of dialogue and interaction in the learning process. The framework is grounded in the idea that teaching is a conversation

among teachers and students, with teachers providing the structure and guidance necessary for students to learn. As described by Laurillard (1999) the conventional methods of teaching in higher education aim to support learning, as it is broadly understood, by means of:

1. acquisition, offered in lectures and reading
2. practice, in set exercises and problems
3. discussion, by conducting seminars and tutorials
4. discovery or investigation, in arranging field trips or practicals

Figure 2.1. Simplified adaptation of Laurillard (2002) Conversational framework - At Micro



The named interactions in Figure 2.1 demonstrate the complexity of communication between teachers and students, which are intended to shape conceptions, relay information, and

provide feedback, all in support of student engagement. For example, a bidirectional interaction is when a teacher shares theories and ideas with their students, informed by their concepts; and students can ask questions or share ideas subject to their own conceptions. It is important to recognize, as illustrated in Figure 2.1, the trigger for a bidirectional interaction between teacher and student can be initiated either by teacher or student. According to Bliuc et al. (2007, p 241) in Laurillard's Conversational Framework the organizing principle is a discussion leading to the development of student understanding wherein all types of educational media (lectures, seminars, tutorials, libraries, databases, microworlds, the internet, etc) play a role in the structure of a meaningful discussion. Moreover, the medium for interaction can be speech, text or visual and it can be digital or analog. Communication media can be seen as the interface for enabling interactions 1) between people and/or 2) with course materials.

Two types of interactions emerge by extension of Laurillard's concept of interaction and communication media in an abstract sense: Narrative and Conversational. These differ in terms of degree of interactivity, presentation of materials and effect on class structure. Laurillard (2002) characterizes lectures, books, films, and television programmes, as narrative in form. *Narrative* materials provide a structure for global coherence in a text containing multiple components. Materials in print, audio and video format all can use a variety of structural cues, such as headings, textual signposts, paragraphing, captions, locations, and camera movement, to enable learners to maintain a sense of the overall structure of the narrative and, consequently, understand its meaning.

Although cues in narrative media serve as engagement prompts, these do not enable dialogue. *Conversational* materials include (a) opportunities for iterative dialogue and (b) opportunities for dialogue. Laurillard (2002) recommended that narrative be restructured to



engage the learner in activities such as (a) reflecting, (b) articulating at the discursive level and (c) playing a part in adapting and acting at the experiential level; if narrative presentational media were to move beyond the limits of linear articulation of concepts. These are the desired attributes of conversational interactions.

The modified characterization offered by Laurillard (2002), whereby instructional strategy is reframed into a set of requirements for any learning situation, prescribes for effectiveness an interaction:

- must operate as an iterative dialogue;
- must be discursive, adaptive, interactive and reflective;
- and must operate at the level of descriptions of the topic;
- and at the level of actions within related tasks.

One of the criticisms of Laurillard's conversational framework is about being too focused on the teacher-student relationship and not taking into account the importance of peer-to-peer interactions in the learning process. Subsequent updates to the framework (Laurillard, 2012) have addressed this criticism by emphasizing the importance of collaboration and discussion among students. Because our interest is in examining class interactions from instructional perspectives, we chose to extend the part of the framework focused on teacher-student interactions as illustrated in Figure 2.1. But the impact of ERT on student-student interaction is certainly an important topic in its own right.

Another limitation of the framework is that it is prescriptive and does not allow for flexibility in the design of digital learning activities. However, by design the framework is intended to be a guide, and not a rigid set of rules. Also, some have critiqued the categorization of interactions into four types (acquisition, discussion, investigation, and practice) as simplistic,

failing to fully capture the complexity and diversity of interactions that may occur in real-world educational contexts (De Laat, 2012).

Despite these limitations, Laurillard's (2002) framework is useful because it provides a structure to approach identification of communication and interaction strategies in the process of designing and evaluating digital learning activities. It helps to identify the different types of interactions that are necessary for learning to take place, including acquisition of new knowledge, discussion and debate, practice and reflection.

By providing a way to map out interactions, Laurillard's (2002) framework can help examine instructional changes in learning activities. Both narrative and conversational interactions can play a valuable role in instruction by promoting engagement, fostering relationships, and enhancing the learning experience for students. It is important to consider how appropriateness and effectiveness of these interactions may vary depending on the context, content, modality and format of the teaching and learning experience.

### ***Modality and Format***

In order to analyze learning activities and class interactions in online learning spaces, it is necessary to take into consideration the dimensions of course modality and format. *Modality* here refers to the way the class is experienced depending on the method of course delivery and/or communication. The types of modality differ in terms of where the participants are located.

*Format* refers to types of communication. Hrastinski (2008) defines asynchronous and synchronous formats, by extending Haythornthwaite's classification of types of communication in the context of e-learning. Three types of communication are depicted - (1) content-related communication, (2) planning of tasks and (3) social support.

Interestingly, Haythornthwaite's classification of communication in the context of e-learning, as adapted by Hrastinski (2008), concurs with the Laurillard (1999) conventional classroom methods, in asserting: desirable e-learning characteristics include content related two-way communication, planning of tasks for homeworks and coordinating, and social support relations; to create an atmosphere for fostering collaborative learning.

### ***Additional Pedagogical Perspectives***

According to Wuensch et al. (2006) an online course is pedagogically different across multiple dimensions:

1. Interaction - Online courses showed a higher level of interaction among students and with instructors, compared to face-to-face courses.
2. Flexibility - Online courses were found to be more flexible, as students could access course materials and participate in discussions at any time and from any location.
3. Student-centeredness - Online courses were more student-centered, as students were able to learn at their own pace and had more control over their learning.
4. Use of technology - Online courses utilized more technology, such as multimedia presentations, online quizzes, and discussion forums.
5. Focus on learning outcomes: Online courses were found to be more focused on learning outcomes, as instructors had to design course materials that were conducive to online delivery.

Steele et al. (2019) suggest effective online pedagogy might include virtually any strategy that (a) enhances the learning experience (including instructional strategies, interaction with technology, vehicles for content delivery, etc.), and (b) emphasizes the context and interactions of the teaching and learning dynamic. These seem to be quite broad and open-ended. One can

imagine the myriad of possibilities stemming from the pedagogical preferences of and choices made by individual instructors and/or instructional designers.

On one hand, the instructors' pedagogical priorities may guide the discourse, to support main learning goals and learning assessments. On the other hand, the online classes may have limitations inherent to digital technology and communication methods. For example, when a student engages with an online course, before interacting with the instructor or instructional materials, the student interfaces with their device - computer, tablet or mobile.

The cognitive load resulting from task-switching and demands on the mind to filter noise can significantly influence engagement. For example, Zhang et al. (2018) found students who listened to music while reading showed an increase in the amount of time spent rereading. Social constraints and norms inherent in in-person classroom settings may serve to limit the kind of distractions and multitasking that students engage in relative to online courses.

Also, while technology can offer unique affordances to instruction, it can also lower the sense of social presence. For example, in a face-to-face class setting instructors can gauge levels of student engagement by sensing the room; however, in a digital setting the ability to feel such sentiments is diminished. Also, from the perspective of students, Wuensch et al. (2009) found the frequency of contact with the instructor via e-mail, interpreted in terms of immediacy and social presence, was the best predictor of perceived quality of courses presented as MOOCS.

According to Anderson et al. (2001) the concept of teaching presence is constitutively defined as having three categories - design and organization, facilitating discourse, and direct instruction. Some have suggested that digital technology might provide new social supports for learning; for example, Cunningham (2015) advocates for the use of Web 2.0 tools to promote instructor social presence, as an enabler for student engagement in the digital classroom.

Web 2.0 tools are helpful to create content, and as such, support collaboration. Narwani et al. (2020) found online video conferencing and digital board technologies can help support co-constructive meaning making and promote intellectual learning communities. Advancements, such as Web 3.0 enable generative content and shared ownership. These offer opportunities to augment learning experiences in nuanced ways, and also raise questions and concerns around challenges to integrate emerging technologies in online education and instructional design.

Ozan et al. (2007) call attention to two issues - (a) the effectiveness of instructional strategies to integrate technologies, and (b) their validity over time. Steele et al. (2019) name a number of challenges in their meta-study of best practices. Instructional design needs to balance the aspects of social presence, meaningful engagement, disciplinary content area coverage, engagement, learning outcomes and technology integration, along with consideration for accessibility, inclusion and cognitive load. From the perspectives of instructors, we enumerate some key questions identified by Steele et al. (2019):

1. Is the technology easy to access?
2. Is the technology easy to use?
3. How will the addition of technology benefit student learning?
4. What is the goal of increasing presence (connection with students, engagement, and so forth)?
5. How does the age of my students impact the implementation of the strategy?
6. What was the course level in which the strategy was effective?
7. How might the course level influence the value of the chosen strategy?
8. Does the instructional strategy help students understand the content better?
9. Will the instructional strategy support additional student engagement in the content?

10. Can the instructional strategy provide students with a different perspective about the content?

These reflect some of the questions instructors might have had during the process of making decisions around instructional changes to move to remote instruction. Undoubtedly, *planned* effort is required to address these and other questions. According to Gallagher and Palmer (2020) “while online learning became the default in 2020, the approach most colleges are employing is simple remote learning via live Zoom classes, a method little evolved from video conferencing from the late-1990s.” What are some predictors of instructional choices and changes in the absence of resources for planning and design? How do instructional responses to remote instruction predict keeping the changes they made? What factors influence instructional choices and decision-making under suboptimal conditions? The pandemic-induced ERT can be seen as an experiment that will lead to two different kinds of insights - ideas about effective (and ineffective approaches) but also insights into broader questions of the dynamics of change and instructional technology adoption.

### **The Experiment of Moving Courses Online**

The stressful conditions of the pandemic did not set instructors, instructional designers or institutions up to use best practices from decades worth of research to create effective online learning spaces. Facing severe constraints of time and other resources, instructors were faced with the arduous and complex task of reimagining their courses and making decisions for instructional changes to fit the changing conditions. These two issues – lack of instructional supports and a severe time crunch – underpin the frame of the experimental phenomenon we aim to study from the perspective of instructors.

ERT presented challenges for the malleability of course instruction as well as the resilience of learning. When we situate ERT into an experimental frame, we can treat the moving of course instruction to online as the *intervention*, and returning to pre-pandemic conditions as the *control conditions*, enabling us to see both immediate and longer term effects. Because we study the experiment retrospectively, we are limited in terms of what we can observe. For example, we do not have access to the decision making processes as they were occurring. However, we can observe the subtleties reflected in changes made in course instruction and learn about the dynamic decisions to delineate factors influencing some of the lasting effects on instruction.

### **Role of Demand Characteristics**

The Orne two-experiment phenomenon depicted by Adair (1984) calls attention to the influence of experimenter bias on responses. The underlying theory of demand characteristics suggests participants alter their behavior depending on their interpretation of the purpose of the experiment. In the Orne phenomenon, an experiment is conducted in two parts.

In the first part, participants are exposed to a manipulation or treatment expected to produce a certain effect. In the second part, participants are led to believe the manipulation was ineffective. Thereon they are exposed to a second manipulation expected to produce the opposite effect. The purpose of the second manipulation is to elicit a contradictory response to the one observed in the first part. It helps identify if the first response was because of manipulation or experimenter bias. If the response changes in the second part of the experiment, it suggests the first response was influenced by experimenter bias. The Orne two-experiment phenomenon underlines the potential for experimenter bias to influence participant responses, even when the experimenter is not consciously trying to influence the results.

Experimenter bias refers to unconscious or conscious biases an experimenter may introduce into a study, influencing the behavior or responses of participants in the study and ultimately influencing the results. Experimenter bias can manifest in a variety of ways, such as through subtle cues or unintentional communication with participants. By acknowledging and controlling for experimenter bias, researchers can improve the validity and reliability of their results. Adair (1984) suggests several ways to minimize the influence of experimenter bias, such as using blind procedures, automating procedures, and using multiple experimenters.

Perhaps the most famous experiment demonstrating demand effects is the so-called Hawthorne experiment, although it has often been misrepresented and misinterpreted (Adair, 1984). Hawthorne effect theory grew out of experiments at Western Electric between 1924 and 1932, aimed at testing productivity changes among workers across diverse working conditions (Jones, 1992). According to Adair (1984) the methodological Hawthorne effect is generally defined as a problem in the field of experiments whereby subjects' knowledge about being in an experiment modifies their behavior from what it would have been without the knowledge. The Hawthorne theory stipulates that productivity is almost always positively impacted by changes to work conditions.

When we contextualize ERT as an experiment, both instructors and students may be seen as involuntary participants, thereby minimizing the influence of experimenter bias on participant responses. This is not to say that students and teachers don't have beliefs about online instruction that will temper their experience. Knowingly or unknowingly instructors and students were trying out alternative methods for teaching and learning, we must consider the effects of associating ERT with an experiment, or at least an experiment of sorts. One thing that *is* unique



about ERT is that even students and instructors whose beliefs would ordinarily preclude them from participating in online instruction were nonetheless forced to do so.

### **Lasting Effects**

In theory the Hawthorne effect helps to identify some sources of lasting change in instruction. Heider's attribution theory, in concept, is a way people can explain other people's behavior. Extending the attribution theory we might explain instructional changes as those arising from a process of self-reflection that faculty underwent, or a result of inadvertent constraints arising from changes made to their working conditions. Multiple sources of the Hawthorne theory effect might be useful to examine instructor experiences during the ERT phenomenon.

There are several interpretations put forth by industrial sociologists and psychologists since the famous Hawthorne experiment. Many were concerned about the Hawthorne effect attribution because of the underlying interpretative process of judging people's intentions. Later questions about the robustness of these results have not kept the theory of a Hawthorne effect from becoming a reason for creation of a school of study under Human Relations (Kompier, 2006). According to one interpretation of the Hawthorne effect (Adair, 1984; Jones, 1992), changes in working conditions induce changes in the ways of working, mostly seen to produce a positive productivity effect lasting beyond the experiment, even after reverting to earlier working conditions.

The first stipulates people change their ways of doing something as a result of psychological factors when placing their work in unfamiliar settings. A second is how people inherently develop improvement strategies out of self-reflection, mainly indirectly brought upon by interventions not designed originally with the intention for self-reflection. The third is people

alter their behaviors when attention is paid towards them or as a result of other social factors. According to Adair (1984) the Hawthorne effect depends on participants' perception of the experiment and their role in it. The context of the experiment prompts adult subjects (or instructors in the case of ERT) to develop a purpose or meaning for the situation, which they then use to guide their behavior (Adair, 1984, p 339).

In inquiring about productivity at an institutional level we might need to acknowledge the role of institutional supports and training in shaping productivity. However, Kompier (2006) opposes attributing the Hawthorne effect to social factors. While attention to individual workers who were subjects in the Hawthorne experiment was perceived as the secret ingredient in affecting productivity changes, Kompier (2006) debunks myths of the Hawthorne effect of social factors being more important as compared to physical factors. Kompier points out that the study took place in the context of *The Great Depression*, when workers would have been particularly worried about losing good jobs.

A third interpretation of the Hawthorne effect connects it with an idea later popularized in Japanese management (Rother - Toyota Kata, 2009), of a process of continuous improvement (called "kaizen") leading to positive changes that accumulate over time. According to Adair (1984) the participants who see purpose in their role in the experiment carry on with improvements resulting from changes they make in the conditions of experiment even after returning to pre-experimental work conditions.

The experimental context of our study makes it a fitting prospect to interrogate the presence of a Hawthorne effect in the processes of rethinking course design during the changing ERT conditions. The dynamics of change and resulting instructional changes made by faculty are in the foreground of our study scope. In order to study instructional perspectives framed by the

experimental context of the pandemic-induced ERT, we require a model to conceptualize features of instructional changes.

### **Conceptualizing Instructional Changes**

The Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model is typically used as a systematic instructional design process for developing new instructional materials or courses, rather than retrospectively classifying changes already made to a course. While the ADDIE model is widely used in instructional design, it may not be the best fit for categorizing instructional changes that have already been implemented in an existing course.

One alternative conceptual model - the Technology, Implementation, and Pedagogy (TIP) model proposed by Bates and Poole (2003), can be more appropriate for classifying instructional changes in existing courses. The TIP model focuses on integration of technology into instruction and identifies three key elements: technology, implementation, and pedagogy. It recognizes that instructional changes in online education often involve the use of technology and the need for effective implementation strategies, as well as alignment with sound pedagogical principles (Gibbs and Gosper, 2006). A range of complementary competencies are prescribed as needs for online instructors (Kim and Bonk, 2006) including technology and social competence. Some critics argue the TIP model potentially overshadows important aspects of instructional design and pedagogy, such as faculty or department needs, and social and collaborative learning (Jones, 2008) because it places too much emphasis on the integration of technology.

Existing models such as ADDIE and TIP are largely prescriptive, presenting what are seen as best practices for integrating technology into education. Our concern is primarily descriptive, and our focus is on what instructors actually did and thought under ERT conditions. With this in mind, the next section will describe features we considered in designing our study.

## **Characteristics of Remote Instruction**

### ***Modality***

To characterize course modality types, we recruit the taxonomy used by the College of Literature, Science and the Arts at the University of Michigan (UofM) for three different teaching modes: Online, In-person and Hybrid. *Online* courses may be completely synchronous, completely asynchronous, or may involve a mix of both modalities: synchronous elements such as live discussions on Zoom) and asynchronous activities such as collaborative annotation of course texts. *In-person* on-site courses are synchronous (all students meet together, at the same time), the synchronous nature of the course only applies to the in-class component, and herein homework activities often might be administered using online tools. In *hybrid* instruction, courses meet synchronously, with some students on-site and some remote (LSA-University of Michigan, n.d.).

### ***Communication***

Across online, hybrid and in-person modality courses, we might see instructional technology used in different ways for the same tasks, or the other way around. We need a set of definitions to distinguish types of communication, and how they are used in online courses, independent of the course modality. According to Hrastinski (2008), in the context of e-learning, broadly speaking, communication is *asynchronous* when work is commonly facilitated by media such as e-mail and discussion boards, or electronic technology that supports relations among learners and instructors, even when they cannot be online at the same time; it is *synchronous* when communication work is commonly supported by media such as videoconferencing and chat, where instructors and learners are participants connected digitally and interacting with each

other at the same time. He argues that synchronous methods have greater potential to support learners in the development of learning communities.

### ***Interaction***

Drawing on the reviewed literature we extract a subset of Laurillard's conversational framework (2002) to describe different types of interactions between teachers and students in an educational setting. It includes four types of interactions:

1. Acquisition: where teachers provide information to students by means of lectures, presentations, or readings.
2. Discussion: where students engage in dialogue and debates with the teacher and/or their peers, prompting the exchange of ideas and perspectives.
3. Investigation: where students actively explore and investigate concepts or problems, often through hands-on activities, experiments, or research.
4. Practice: where students engage in repeated practice and feedback to develop their skills and knowledge by means of learning activities such as quizzes, assignments, and assessments.

We can also consider *narrative* and *conversational* interactions as two additional types of interactions by extending Laurillard's (2002) framework:

- Narrative interactions: Narrative interactions involve storytelling or narrative-based activities, where teachers or students share stories, anecdotes, or examples to illustrate concepts, convey experiences, or engage in reflection. Narrative interactions can help to contextualize information and make it more relatable and memorable for students.
- Conversational interactions: Conversational interactions refer to the back-and-forth exchanges, discussions, or dialogues between teachers and students, or among students

themselves. Conversational interactions are characterized by active participation, questioning, elaboration, and negotiation of meaning, and they can facilitate deeper understanding, critical thinking, and collaborative learning.

***Conceptual Model for Instructional Changes***

The (1) characteristic types of course modality using definitions of teaching modes (LSA-University of Michigan), (2) communication modes using Hrastinski (2008), and (3) interactions underlying instructional style by extending the Laurillard (2002) framework, underpin the conceptual model.

The *Interaction Modality Communication* conceptual model proposed for the study to inform instrument design, data collection and analysis is illustrated in Figure 2.2. The conceptual multidimensional model enables a design grounded in theoretical frameworks in a way so as to elicit instructional changes from faculty perceptions about their experiences transitioning online during ERT, and categorize themes emerging from those perspectives.

Figure 2.2. Conceptual Model - Interaction Modality Communication (IMC)

Dimension	Modality			
Interaction				Communication
	in-person <sup>1</sup>	online <sup>1</sup>	hybrid <sup>1</sup>	
Narrative <sup>3</sup>				Synchronous or Asynchronous <sup>2</sup>
Conversational <sup>3</sup>				Synchronous or Asynchronous <sup>2</sup>
	in-person <sup>1</sup>	online <sup>1</sup>	hybrid <sup>1</sup>	

1 definitions of in-person, online and hybrid teaching modes from College of Literature, Science and the Arts (UofM) as modality  
 2 definitions of synchronous and asynchronous communication in learning contexts drawn from Hrastinski (2008) modes of communication  
 3 definitions of narrative and conversational interactions in a classroom context drawn from Laurillard Conversational framework (2002)

The model serves to inform the data collection instrument design and for an inductive qualitative approach during data analysis. The first dimension is concerned with *Modality* of the instructional change elicited. The second dimension of *Communication* is characteristic of the mode of communication in the instructional element where the change might be observed, as being either synchronous or asynchronous. The third dimension of *Interaction* allows categorizing the instructional change ascribed to an instructional element either associated with narrative interaction or conversational interaction.

In addition to these three dimensions, we also look at the extent to which a technology was used across *multiple* modalities, communication types, or interaction formats. Mapping instructional changes across these dimensions can identify effects in terms of instructional changes showing up across multiple modalities, and inherently across time.

We need a specific hypothetical sample to demonstrate how the model works. Let us take an example of an instructor who taught a course online during the first semester of the pandemic, and later in a hybrid modality and reported assigning students to watch pre-recorded lectures for self-paced learning. The instructional change is narrative, because the instructional content is more or less unidirectional and asynchronous and the media interface is meant to deliver information for on-demand consumption (not in real time). Depending on the type of course we ascribe the modality as online.

Figure 2.2.1 illustrates the filled out IMC using the hypothetical sample data during the online course phase. Figure 2.2.2 illustrates the incrementally filled IMC for the subsequent instance of the instructional change (pre-recorded lectures) in the course taught in a hybrid modality. The recurrence of the instructional change across multiple modalities in succession demonstrates the continued use of pre-recorded lectures even after the need for ERT receded.

Figure 2.2.1. Conceptual Model - Interaction Modality Communication (IMC) Hypothetical

Sample

Dimension	Modality			
Interaction				Communication
	in-person <sup>1</sup>	online <sup>1</sup>	hybrid <sup>1</sup>	
Narrative <sup>3</sup>		pre-recorded lectures		Synchronous or Asynchronous <sup>2</sup>
Conversational <sup>3</sup>				Synchronous or Asynchronous <sup>2</sup>
	in-person <sup>1</sup>	online <sup>1</sup>	hybrid <sup>1</sup>	

1 definitions of in-person, online and hybrid teaching modes from College of Literature, Science and the Arts (UofM) as modality

2 definitions of synchronous and asynchronous communication in learning contexts drawn from Hrastinski (2008) modes of communication

3 definitions of narrative and conversational interactions in a classroom context drawn from Laurillard Conversational framework (2002)

Figure 2.2.2 Conceptual Model - Interaction Modality Communication (IMC) Hypothetical

Sample continued

Dimension	Modality			
Interaction				Communication
	in-person <sup>1</sup>	online <sup>1</sup>	hybrid <sup>1</sup>	
Narrative <sup>3</sup>		pre-recorded lectures	pre-recorded lectures	Synchronous or Asynchronous <sup>2</sup>
Conversational <sup>3</sup>				Synchronous or Asynchronous <sup>2</sup>
	in-person <sup>1</sup>	online <sup>1</sup>	hybrid <sup>1</sup>	

1 definitions of in-person, online and hybrid teaching modes from College of Literature, Science and the Arts (UofM) as modality

2 definitions of synchronous and asynchronous communication in learning contexts drawn from Hrastinski (2008) modes of communication

3 definitions of narrative and conversational interactions in a classroom context drawn from Laurillard Conversational framework (2002)



## **Benefits of using IMC**

The dimensions included in the IMC, by means of abstraction, characterize features of instructional change enabling seeing these from both constructivist and cognitivist perspectives. More importantly, the conceptual model is technology agnostic and thereby can be recruited to study features of instructional change in any instructional modality and learning environment.

As a tool to support course design or redesign the IMC enables designers and instructors to conceptualize, identify and contextualize instructional changes. For example, if pre-recorded lectures are used in in-person instruction to support flipped-learning versus in online courses to substitute synchronous lectures, the contextual differences are important for designers and instructors to take into consideration for purposes of design and evaluation. The model can also be recruited to enable visibility, reflection, assessment and improvement of course design. The conceptual model helps us across multiple units of analysis, including a lesson activity, lesson or session, course or program, thereby offering educators and instructional designers the ability to zoom in or zoom out as needed. In the context of studying instructor perspectives - data in the form of testimonials and textual responses, the IMC supports coding for analysis of qualitative data. Overall, the IMC can address the gap of a much-needed technology-agnostic analytical tool to map cognitivist-constructivist aspects of course instruction.

## **Scope, Assumptions and Limitations**

We must also acknowledge the assumptions and limitations of this approach. Because a learning scientist perspective is a predominant lens to develop the IMC model, it can limit the aspects technologists and instructional designers might be interested in exploring. Furthermore, the focus of the IMC model is to help conceptualize instructional changes from an instructor's perspective, and thereby we might not be able to capture fine grained changes on cognitive

dimensions, for example around sensory stimulation in learning materials, or lack thereof. We are also not able to unpack the effects on cognitive load of individual instructional changes.

The scope of the IMC model includes conceptualizing instructional changes made by individual instructors during ERT. The multiple dimensions enable representation of instruction changes across different modalities of instruction. The scope does not include the decision making process itself. IMC cannot help make visible the criteria for making instructional choices and does not include a way to reference the baseline of instructional changes. However, not being limited to an experimental frame of reference enables extending the IMC to conceptualize instructional changes beyond such conditions of disruption or crises.

Another underlying assumption is around the uniqueness of instructional change features. IMC assumes individual instructors make changes to instruction even when teaching multiple courses at the same time. Although focusing on individual instruction enables closer examination of course changes, it might limit the ways course changes can be analyzed as a collective set because of individual course nuances. An examination of motivation and criteria for instructional choices are also not represented in the model.

A critique of the design can be the lack of consideration of social and cultural aspects of interactions in educational contexts. The model extends definitions from a framework (Laurillard, 2002) primarily focusing on cognitive aspects of learning, such as the acquisition of information and development of skills, and constructivist aspects of interactions between teachers and students. However, it may not fully address social, emotional, and cultural dimensions of learning, each an important factor influencing student engagement and learning outcomes. These and other dimensions may emerge as part of studying instructional responses. The multidimensional nature of the conceptual model lends it flexibility to support extensions in

order to accommodate any emergent dimensions necessary to represent instructional change features.

The scope of the model also does not include granular elements of teaching because it processes the combination of pedagogical and technological elements as an instructional change. The classification of multidimensional multimodal instructional changes can be useful in the process of abstraction.

The conceptual model proposed serves (a) to represent emergent qualitative themes from the analysis of instructional perspectives about their experiences of making instructional change and (b) as a framework to design data collection instruments for research about instructional changes. We need to further develop a methodology and instrument in order to test the validity of IMC and the claims about its ability to support qualitative analysis of inquiries. In the next chapter we describe the methodology and instrument to support our broader inquiry of instructional perspectives to study instructional changes and lessons learned from instructor experiences of pandemic-induced remote instruction and instruction in ensuing new-normal conditions.

## **Chapter 3**

### **Methodology to Examine Instructional Perspectives**

The COVID-19 pandemic unfolded in 2020 and had a profound impact on education worldwide, propagating unprecedented disruptions and challenges. As experts in the field of education, educational psychologists and educational technologists are tasked with understanding and addressing the multifaceted effects of the pandemic on students, teachers, parents, and educational systems at large.

Education disruptions affected more than 220 million tertiary-level students around the world, according to a global survey by UNESCO (2021). Several studies examined the impact of remote learning from the perspective of students in different countries, mostly centered around learning outcomes (Bahasoan et al., 2020; Hidayat and Wibawa, 2020; Huang et al., 2020). It is common to associate learning outcomes with instructional effectiveness. However, evaluating instruction during the pandemic is myopic without an understanding of instructional responses in the context of the disruption. This is particularly important because instructors made many of the decisions about how to teach during the pandemic, and had varying degrees of autonomy in how to implement decisions made by others.

In order to maintain some continuity educational institutions shifted to remote instruction to the extent they could do so. Hodges et al. (2020) proposed the term Emergency Remote Teaching (ERT) to refer to the shift to online as an alternative method of education delivery, helping put into perspective the response of instruction to a crisis. Although some researchers

analyzed perspectives of instructors during the early phase of the pandemic in the United States (U.S.) (Cameron-Standerford et al., 2020; Cutri, 2020; Hodges and Fowler, 2020; Narwani et al., 2020; Cooper, 2021), we lack a deeper understanding of (a) the features of instructional changes in the changing conditions of the pandemic as it persisted, (b) the outlook of instructors towards instruction after ERT and (c) factors influencing instructional choices in different conditions in diverse cultures. We are particularly interested in perspectives of college instructors in the U.S. and China. With India, these countries have the largest populations of university students in the world (WikiMedia Foundation, 2023).

The chapter presents the methodology used to examine the perspectives of instructors in China and the U.S. on their experiences teaching in the dynamic conditions that ensued during and after pandemic lockdowns. The chapter outlines the research design, sampling procedures, data collection process, and data analysis approach. A detailed description of the methodology includes a cross-cultural online questionnaire incorporating open-ended and rating questions. The rationale behind the chosen methodology is discussed, including the advantages of using a mixed-methods approach. Additionally, potential limitations of the methodology and steps taken to mitigate them are addressed.

The terms “instructor”, “educator” and “faculty” are used interchangeably to refer to those members of higher education academia who conduct education. We use the terms “student” and “learner” synonymously. The terms “online/distance education” and “online/distance learning” are used to refer to the teaching and learning experiences when instructors and students are in separate physical locations.

## **Purpose**

A UNESCO (2021) report serves as an overview of the situation of the higher education system at national and global levels in the wake of the pandemic disruptions. Their survey was designed to assess the impact on the higher education system in terms of access to education, equity and quality of teaching and learning, university operations, national challenges, emerging issues and strategic responses. The report is a valuable source of information about immediate responses of higher education, as a system across 57 countries. Although it is a high-level snapshot of impact as a whole, it does not capture the distinct experiences of instructors and their responses to the demands of remote instruction.

We need a window into perceptions of instructors on changes in teaching and learning in different conditions. Conditions for online education can be described relative to the pandemic as: pre-pandemic, pandemic-onset and post-lockdowns. Furthermore, because the pandemic lockdowns were not experienced uniformly across the world, instructional responses in different settings are a rich source of lessons about different possible responses. Examining instructional experiences in different cultural contexts can significantly broaden our understanding of pedagogical principles and mediators for technology adoption for teaching under unprecedented conditions.

The following overarching questions shaped our inquiry into the characteristics of instructional experiences during ERT. How far do instructional responses to challenges reflect cultural contexts? What other factors influenced the ways instructors responded to the demands of ERT? What are some nascent features of instruction during ERT? What are some of the characteristic features of instructional changes? What evaluative criteria and measures can influence instructor perceptions about instructional changes? What are some of the predictors of

their outlook towards the future of online instruction? Our goal is to develop an understanding of how instructors responded to the pandemic that can contribute to a general understanding of technology adoption and use, as well as insights that might be useful in future emergencies.

### **Approach**

The pandemic accelerated the reliance on technology for remote and online learning. The sudden shift to virtual classrooms, remote teaching, and digital tools has posed unique challenges and opportunities. Educational technologists played a pivotal role in facilitating the transition to remote learning, providing guidance on the selection and implementation of educational technologies, training teachers and students on digital literacy skills, and ensuring equitable access to technology resources. They have also been involved in the design and evaluation of online learning environments, incorporating evidence-based principles of instructional design, human-computer interaction, and educational technology integration to help overcome the challenges where possible from an educational technologist's position.

From the perspective of an educational psychologist, the pandemic brought to the forefront discussions about a myriad of psychological factors influencing learning and well-being. Students faced increased stress, anxiety, and uncertainty due to disruptions in their academic routines, social interactions, and extracurricular activities. Educational psychologists were called upon to provide support and interventions to address these challenges, including strategies to promote resilience, emotional regulation, and coping skills. Additionally, the pandemic exacerbated issues related to mental health, equity, and access to education, requiring educational psychologists to advocate for inclusive practices and support vulnerable populations.

Instructors served as the main facilitators of continuity in education. They had to mediate instruction, for example ERT and its accompanying challenges, at the intersection of students

and educational technology. The transition to an online format for graduate courses produced a surge of creativity in terms of ways to offset the absence of in-classroom interactions (Narwani et al., 2020).

There have been a few limited studies on the perspectives of college instructors at the onset of the pandemic. A case study of instructors' experiences to translate lesson activities for online formats revealed changes such as (a) reading reflections, (b) collective reading analysis in groups and (c) whole group synthesis (Narwani et al., 2020). Some studies identified challenges named by instructors included: (a) students' equitable access to online learning, (b) managing demands of scholarship and academic community service duties and (c) need for institutional resources to support online instruction and (d) faculty readiness for online instruction (Cameron-Standerford et al., 2020; Cutri et al., 2020). A majority of scholarship focuses on student perspectives and experiences. Although these reports capture an essential aspect of online learning and ERT, they do not help portray the full image.

The voices of teachers and an account of their experiences are key for painting the complete picture of remote instruction. Moreover, by examining perspectives of instructors globally we can enrich understanding ERT, instructional change and decision making under constrained teaching conditions, to add to the knowledge in the fields of educational leadership, educational psychology and educational technology. We take into consideration the research method needed to support a phenomenological inquiry about instructor perspectives around their experiences of pandemic-induced online ERT.

### **Method**

The research is primarily descriptive, and our focus is on what instructors actually did and thought under ERT conditions. The types of data include reflections and self-reports from



instructors. Our study adopts a mixed-methods approach to collect and analyze reflection and rating types of data. Mixed-methods research as defined by Johnson et al. (2007) relies on qualitative and quantitative viewpoints, data collection, analysis, and inference techniques combined to address the main research questions. Because of the nature of our inquiry, approaching it with mixed-methods creates a conduit to qualitative and quantitative data, and according to Johnson et al. (2007, p 124) opens up a channel to add unique insights to consider most, if not all, research questions.

### **Objectives**

The design of the study aimed to address the following objectives:

- Collect instructor experiences of teaching in pandemic and immediately after the lock-downs were lifted.
- Elicit instructors' perspectives about instructional changes, instructional technology use, student engagement, challenges and their outlook towards future instruction.
- Assess instructional perceptions, beliefs and attitudes around ERT, technology and online learning.
- Help shed light on the thought processes underlying instructional changes and instructional decision-making process(es) in response to disruptions in teaching and learning.
- Help examine differences and commonalities in instructional perspectives across diverse cultural contexts by making inquiries in the U.S. and in China.
- Help assess and identify instructor needs for instructional design and online education by soliciting their voice in the form of reflections and self-reports.

- Identify lessons learned and key takeaways from instructors' experiences of pandemic-induced remote instruction and instruction in ensuing new-normal conditions.

## **Instrument**

Our mixed-methods study employed a structured questionnaire given to university instructors, to collect data about instructor experiences in the form of ratings and reflections on moving their course instruction online. Our research required a multilingual design because it was meant to address participants who are English and Chinese language speakers. This in turn required steps to ensure the comparability of versions in different languages. Moreover, distribution across universities in the U.S. and China required maintaining anonymity of response data.

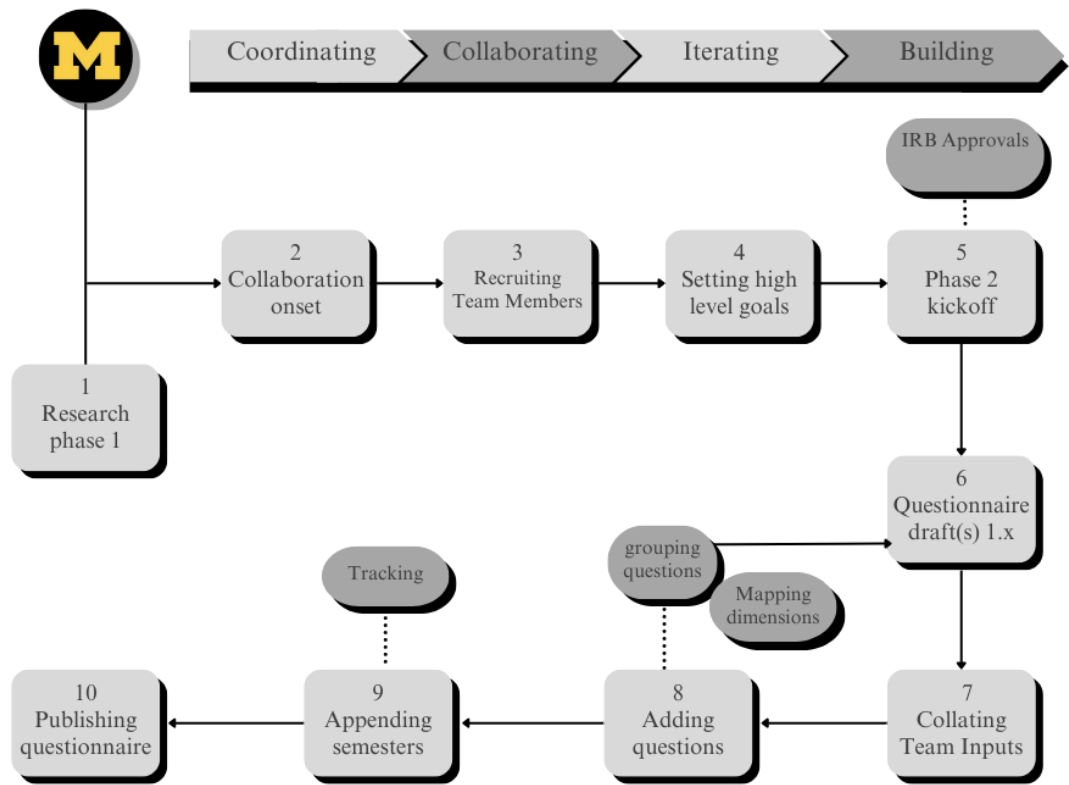
The questionnaire development project involved collaborators from China and the U.S. The project was led by the author's advisor Prof. Kevin Miller affiliated with the Combined program in education and psychology at the University of Michigan (UofM). To strengthen the research and enable cross-cultural data collection the project was conducted in collaboration with Beijing Normal University (BNU). The study was conducted under Institutional Research Board (IRB) approvals at both universities. Figure 3.1 depicts the project from a high-level perspective.

The cross-cultural instructor perspectives project involved twelve researchers divided into two groups, categorized by location, managed by two principal investigators, one in the U.S. and the second in China.

Development of the instrument entailed three phases, spread over eight (8) months. In the first phase, the principal investigator in the U.S. led the research group meetings remotely to enable question forming and norming. After setting up mechanisms for communication and

questionnaire configuration management, the author led the U.S. group during the questionnaire survey design phase by collaborating with research team members and enabling iterative design. In the third phase the U.S. group collaborated with the group in China to finalize the questionnaire to make it ready for distribution.

Figure 3.1. Cross-national Questionnaire Development Project - High level perspective



The research design and development project were guided by the following underlying principles:

- (a) Not be reductive of diverse conditions: We take into consideration the diverse conditions framing instructor experiences of ERT across the U.S. and China. For example, there

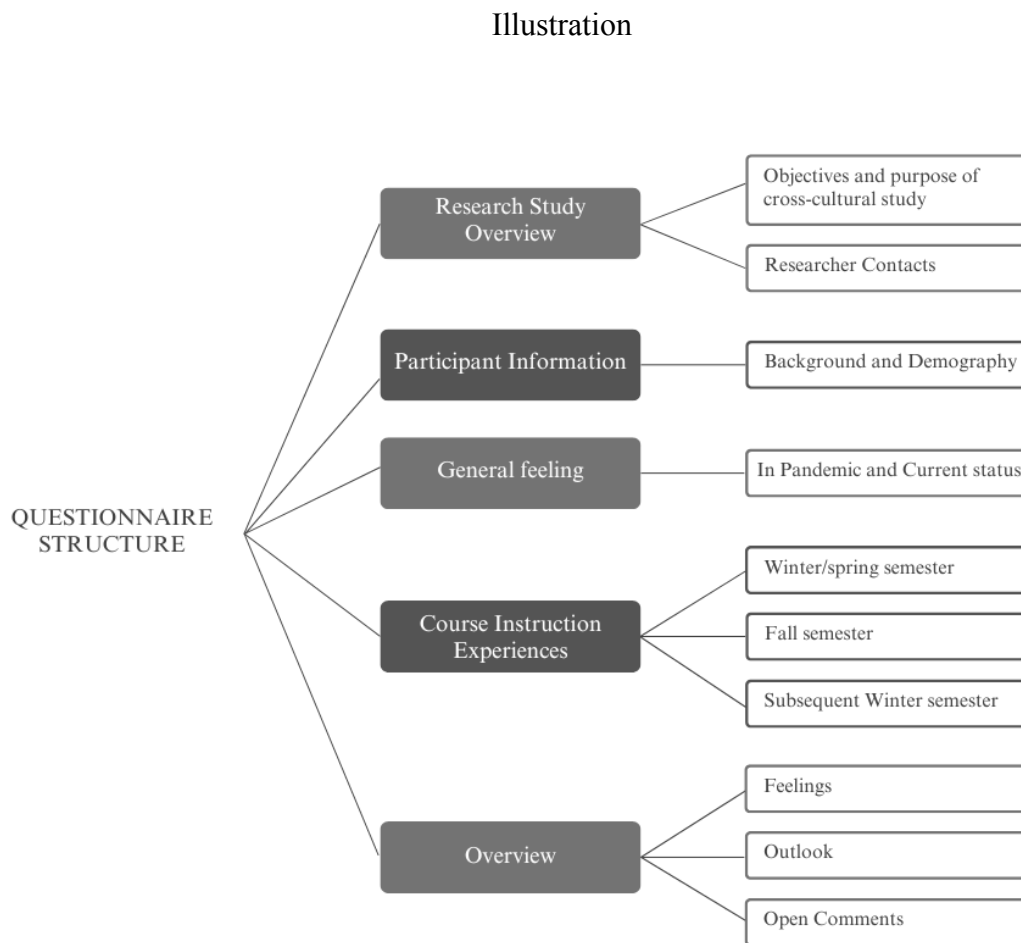
were marked differences in when the pandemic lockdowns were enforced and lifted, which in turn influenced when colleges returned to in-campus teaching.

- (b) Not oversimplify the complexity of integrating educational technology online: There is a foundation of four decades of research on the role of digital technology in higher education. Technology has changed dramatically over time and ERT placed new demands, but we wanted to build on this wealth of previous research. Previous research has brought to light the complexity and the heterogeneity of strategies for implementing or integrating educational technology in college instruction, and our aim is to avoid over-simplifying the picture of instructor responses to ERT.
- (c) Honor the voice of instructors: Instructors are primarily responsible for directing their courses and ultimately are evaluated for instructional effectiveness on course learning outcomes. They make critical decisions that may determine whether or not a technology will be used effectively. We recognize and appreciate the crucial role of instructors and seek to elevate their voices in instructional design and in shaping the future of higher education.
- (d) Ensure reproducibility and language adaptability across different cultures: The focus of the research study is cross-cultural. In order to ensure inclusivity for speakers of both English and Chinese languages the design must take into consideration the needs of the diverse audiences and contexts.
- (e) Support ongoing iterations and updates: Iterative design can strengthen the study by enabling multiple rounds of review and ensuring every researcher's inputs can be taken into effectively and efficiently. In order to minimize inefficiencies it requires establishing mechanisms for configuration management, such as a version control system.

## Questionnaire Design phase

The instructor questionnaire was designed and deployed using Qualtrics online survey software platform and consists of twenty two sections (Appendix 1). Figure 3.2 depicts the overarching structure of the design of the questionnaire. The first is a language selection section prompting participants to select their preferred language (English, Simplified Chinese, Traditional Chinese).

Figure 3.2. Cross-Cultural Instructor Perspectives Questionnaire Structure - Simplified



The second section introduces the study and its objectives to participant instructors, and prompts instructors to share background information (seven questions) around their academic

work. The third section varies depending on the language choice and presents two optional demographic questions, oriented for American and Chinese cultural contexts respectively. The fourth section consists of five questions that elicit reflections from faculty about their general feelings around *Moving Courses Online*, by means of two open ended text response questions and two rating questions and 1 multiple choice question.

The ensuing sections employed a looping logic cycling across three semesters, between the second semester (Winter/Spring) of the academic year 2019-2020, to the second semester (Winter/Spring) of the academic year 2020-2021. In each semester cycle section, the participant is asked about undergraduate and graduate level courses they taught. The participant is first prompted to answer a yes/no question asking if they taught during the semester, followed by a prompt to enumerate the number of undergraduate courses they taught during the semester. A set of seven questions is repeated for the number of courses taught.

Next, participants are asked about the number of graduate courses they taught during the semester. A set of questions oriented to graduate level courses are repeated for each course. Each set of questions consists of seven question prompts repeated for the number of courses, every semester at every course level.

The first two questions collect information about the course taught; One question identifies course type - lecture class in one section, lecture class in multiple sections, seminar with discussion, laboratory or methods course, field experience or other practical instruction, online course (MOOC or other online format). The second question concerns the number of students in the course. The third question elicits the Course Modality - online, in-person or a mix of in-person and online (hybrid). The fourth question asks about the technology used for the course instruction, eliciting whether the software or technology was used for the first time and

whether the participant might see use for it in future instruction. The fifth question asks for a rating of the attributes of the online instruction from a faculty perspective - effort involved in teaching the course, effort needed to monitor student learning, understanding of students learning, student engagement, student workload, course-related peer-to-peer interaction, student motivation, student attendance, quality of student learning. The sixth question prompts the faculty to reflect on the main challenges faced during instruction. The seventh question asks what the participant might think about doing differently in teaching the course online again.

Participants are presented with at least 20 questions (if they did not teach in any of the semesters), and at most 48 questions (if they taught at least one course across the semesters Winter/Spring 2019-2020, Fall 2020-2021 and Winter/Spring 2020-2021) plus an additional 7 questions added for each course taught. The maximum in our dataset was an instructor who taught ten (10) courses across the cycles and so was presented with a total of 90 questions overall.

### ***Rationale***

Surveys and questionnaires are valuable tools in educational psychology research because they allow researchers to gather information from a large number of participants efficiently and in a standardized manner. Surveys can provide quantitative information we can analyze statistically, providing insights into attitudes, opinions, behaviors, and characteristics of individuals or groups. Surveys can also help elicit textual reflections and responses to open-ended questions to support collecting longer utterances from participants as qualitative data.

Surveys rely on the participant to self-report, providing insights into their subjective experiences, perceptions, and beliefs. The limitations of self-report data have been

well-described (Nisbett & Wilson, 1977), but surveys remain a vital and widely used tool for soliciting reports on behavior and for elucidating attitudes.

Popular uses of survey methodology in educational psychology include:

- (a) Assessing student attitudes and beliefs: Surveys are used to investigate student attitudes, beliefs, motivation, and engagement in various educational contexts.
- (b) Evaluating instructional effectiveness: Surveys help assess the impact of instructional practices, teaching methods, and interventions on student learning outcomes.
- (c) Conducting program evaluations: Surveys are employed to evaluate educational programs, assess their effectiveness, and gather feedback from participants.
- (d) Investigating psychological constructs: Surveys are utilized to measure constructs such as self-efficacy, self-esteem, learning styles, and academic achievement.
- (e) Conducting needs assessments: Surveys help identify the needs and preferences of learners, guiding the development of tailored educational interventions.

Because our objectives include assessing instructor perceptions, beliefs and motivations around instructional changes in response to different demands in diverse teaching conditions, the questionnaire design needed to be tailored accordingly. Our survey design is informed by collective knowledge around surveys in social science (Bryman, 2016) and principles proposed by Dillman et. al (2014) for a tailored-design approach in mixed methods research. Our study also used emergent thematic analysis of qualitative data in order to be as descriptive as possible. In order to do so, many open-ended questions are placed along the questionnaire.

Mixing open-ended and closed-ended questions in survey questionnaire design can offer several benefits and enhance richness of collected data. We took into the consideration the following:



- Depth of responses: Open-ended questions allow instructors to provide detailed and nuanced responses, offering insights into their thoughts, feelings, and experiences. Close-ended questions, on the other hand, provide structured response options and enable easy data analysis and comparison across participants.
- Flexibility and participant expression: Open-ended questions give instructors the freedom to express their ideas and provide responses. These may not fit predefined response categories, allowing for a broader range of perspectives and potentially uncovering new insights.
- Quantitative analysis and statistical comparisons: Close-ended questions provide quantifiable data for analysis using statistical techniques, allowing for easy comparisons and generalizations.
- Data triangulation: Using both open-ended and closed-ended questions, such as rating questions, allows triangulating the findings. The structured responses from close-ended questions can be juxtaposed or complemented by rich and context-specific information obtained from open-ended questions, enabling a more comprehensive understanding of instructor experiences and perspectives.
- Participant engagement: Mixing question types can enhance participant engagement by providing a variety of response formats. Participants may find open-ended questions more engaging as they allow for personal expression, while close-ended questions can make the survey completion process quicker. Alternating between the need to be more thoughtful and more straightforward can enhance engagement.

In the questionnaire we consider the balance between the two types. Too many open-ended questions can burden participants and increase survey completion time, while an

overreliance on close-ended questions may limit the depth and richness of responses. Alternating rating and open-ended questions are evenly distributed across the length of the questionnaire in order allow participants to pause and reflect in between open-ended questions.

The text, structure and language choice for the question prompts are not arbitrary. The designers were intentional about choosing simple language for question prompts and enabling minimal loss in translation for the purposes of distributing a multilingual survey questionnaire.

By design the questionnaire is meant to enable collection of a wide range of data across 32 variables. Some of the variables can be interpreted from extracted data sets pertaining to other dimensions. The variables can be grouped into the three high level categories: Instructor, Course Instruction and Mediating factors. Below is the list of 32 variables.

- Instructor
  - Experience level
  - Demographic/Identity
  - Discipline
  - Region
  - Cultural Context
  - Life Aspects
  - Institutional policy (Change)
- Course Instruction
  - Teaching Period
  - Course Level
  - Course Type
  - Class size

- Software Tech Choices
- Technology effectiveness (perception)
- Instructional Choices
- Aspect of Instruction
- Multiple Teaching formats
- Challenges
- Student engagement (perception)
- Changes in Course
- Change in Teaching
- Other Qualitative Comments
- Mediating factors
  - Motivation
  - Interaction type and modality
  - Instructional style
  - Multiple periods (waves of teaching cycles/semesters)
  - Language
  - Acceptance of Technology
  - Institutional support
  - Course load
  - Underlying pedagogy
  - Teaching Expertise level
  - Instructional effectiveness (perception)

### *Questionnaire Design Underpinnings*

Because the context of this research was the sudden changes in teaching that led to ERT, the Hawthorne effect theory might help explain what we can anticipate hearing about instructional changes from faculty in their responses, as they engaged in self-reflection. In order to test the Hawthorne effect, we turn attention to faculty perceptions about their experiences transitioning instruction to online and changes they are making to their instruction coming out of these experiences.

In reacting to the inadvertent shift and manipulated conditions of teaching, we asked faculty what they are taking with them going forward. Earlier studies had controlled for attention, awareness and novelty but did not find evidence collectively to suggest the significance of these factors (Adair, 1984 , p 339). Heeding Adair (1984) in studying reactivity to experimentation, evidence suggests two factors might account for effects - identification of purpose and expectation of one's own behavior. The study design takes these into account by making sure prompts elicit information about instructor's awareness about: (a) effort involved in transitioning online, (b) modality-shift induced changes and (c) novelty of first-time online instruction. The following questions support analysis of the Hawthorne effect:

#### A. section 5 - Semester Loop Course Level question set

1. How was this course taught? (q4.1.3, q4.2.3, q4.3.3 and q5.1.3, q5.2.3, q5.3.3)
2. What software and online technology tools helped you in instruction? Please specify any technologies you used for the first time or in a new way? What technologies do you intend to reuse? (q.4.1.4, q4.2.4, q4.3.4 and q5.1.4, q5.2.4, q5.3.4)

3. Please rate the following compared to teaching this course in a different format (online vs. in-person) (Very Low, Low, Medium, High, Very High)
  1. Your effort involved in teaching the course
  2. Your effort needed to monitor student learning
  3. Your understanding of students learning
  4. Student engagement
  5. Student workload
  6. Course related peer-to-peer interaction
  7. Student Motivation
  8. Student Attendance
  9. Quality of student learning(q4.1.5, q4.2.5, q4.3.5 and q5.1.5, q5.2.5, q5.3.5)
4. What are the main challenges you faced teaching the course? (q4.1.6, q4.2.6, q4.3.6 and q5.1.6, q5.2.6, q5.3.6)
5. What would you do differently in teaching this course online again? (q4.1.7, q4.2.7, q4.3.7 and q5.1.7, q5.2.7, q5.3.7)

### **Procedure**

Data was collected about instructors experiences as they traversed three teaching semesters from January 2020 to June 2021. We took into consideration the differences in teaching conditions and institutional responses across the two countries we study. An assumption we make is faculty in the U.S. could make a choice about the modality for courses taught after January 2021; and in China the University mandated an in-person on campus taught semester starting in January 2021, with special permission required to teach in a different format.

The questions in the instructor questionnaire prompt faculty to reflect and report on their ERT experiences of instruction and supporting student engagement, beginning with the pandemic-onset period starting in early 2020, and continuing for each subsequent semester of teaching across different course modalities. We can treat these periods as different waves including pandemic-onset, peak-pandemic and post-lockdowns. The questionnaire elicits the course modality of instruction, pertaining to the semester we inquire about, in order to reflect differences across institutional policies around teaching.

Qualitative data collected about instructional perspectives can be processed using an inductive thematic analysis approach. More specifically, instructional change categories can be analyzed using the Interaction Modality Communication (IMC) conceptual model (described in Chapter 2). The conceptual model enables seeing instructional changes from both constructivist and cognitivist angles. Although the model is explicit about identifying instructional change features along the three dimensions - interaction, modality and communication, it is flexible and can accommodate additional dimensions to represent characteristics emerging from the thematic coding of the qualitative data. More importantly, the conceptual model is technology agnostic and thereby can be used to study features of instructional change in any instructional modality and learning environment, across the two higher educational contexts that make up the frame of our study.

### ***Themes In Instructional Changes***

After a process of data cleaning and close reading of text, high level non-exclusive codes for Instructional Change were identified, combining Communication and Interaction to map onto our Interaction Modality Communication (IMC) Conceptual Model.

Category descriptions draw upon the narrative and conversational interaction types underpinning our IMC Conceptual Model. The *Modality* dimension is used to associate emerging categories with course instruction across the three named modalities - In-person, Online and Hybrid. Themes showing up across multiple *Modality* boxes in the IMC Conceptual Model enables us to delineate the lasting effects on instructional change, because they are not restricted to any one modality or semester. Themes appearing across modalities are interpreted as possibly persisting across semesters and therefore can be seen as lasting instructional changes. The recurrence of the instructional change across multiple modalities in succession demonstrates their continued use. For example pre-recorded lectures showing up in online and hybrid modalities is indicative of an instructional change continuing even after the need for ERT receded.

We anticipate the high level categories of instructional changes map onto the conceptual model and any emergent themes can be accommodated by extending the model. We can zoom in on the criteria and motivations for instructional changes by triangulation of perceptions towards student engagement, student learning and instructional effort. Across the two different cultural contexts we can compare and contrast instructional changes in diverse conditions, as well as beliefs and attitudes towards online instruction. We can juxtapose the outlook of instructors towards online teaching to technology acceptance in order to draw interpretations about behaviors and instructional changes. In the next chapter we delve into the results and findings from the study of cross-cultural instructional perspectives.

## **Chapter 4**

### **Colors and Shades of Instructional Perspectives**

As universities responded to the pandemic-induced lockdowns and education transitioned to online platforms, instructors faced numerous challenges and opportunities delivering effective remote instruction. To gain insights into their experiences, perceptions, and ratings of remote instruction, during and after the pandemic lockdowns, an online questionnaire was administered to a diverse sample of instructors in the United States (U.S.) and China. We present findings with valuable testimonials and ratings by instructors about their remote teaching experiences.

We report findings at multiple levels of analysis, each enabling an examination of different aspects of college instruction. At the level of the course, we examine instructional changes made by instructors and their distinctive features. At the instruction level we examine the relationship between instructional changes and perceptions around demands on instruction and quality of learning. At the individual instructor level we study instructors' perceptions of remote teaching to better understand the underlying psychology of change. The chapter presents these findings in the same order.

This chapter begins with a brief overview of the research design and methodology employed to gather data from instructors. The online questionnaire was crafted to address a range of topics, including instructional strategies, digital technology tools, predictors of learning such as student engagement, and overall outlook towards online instruction. The sample



consisted of a diverse group of instructors from various disciplines, institutional settings, and geographic locations, ensuring a broad representation of perspectives.

The subsequent sections delve into the key findings derived from the questionnaire. Our findings provide rich insights into instructors' experiences, illuminating some of the unique challenges they encountered during the transition to remote instruction and the innovative strategies they employed in responding to demands in unprecedented conditions. Additionally, the chapter examines ratings and qualitative data to learn about the instructors' perceptions of the advantages and limitations of remote instruction, as well as underlying beliefs and attitudes toward online learning environments.

It is important to acknowledge that our findings reflect the subjective experiences and perceptions of the participating instructors. Their ratings and testimonials provide a valuable lens to examine the impact of remote instruction on teaching practices. However, it is crucial to consider the broader contextual factors that may have influenced their responses, such as the nature and level of institutional support, technological resources and infrastructure, and students' readiness for online learning. By understanding instructors' perspectives, we can inform the development of effective strategies and support mechanisms that foster high-quality online instruction.

The terms “instructor”, “educator” and “faculty” are used interchangeably to refer to those members of higher education academia who conduct education. We use the terms “student” and “learner” synonymously. The terms “online/distance education” and “online/distance learning” are used to refer to the teaching and learning experiences when instructors and students are in separate physical locations.

## Cross-Cultural Study

Data was collected from instructors about their experiences traversing three teaching semesters from January 2020 to June 2021. Questions in the instructor facing questionnaire prompt them to reflect upon and report on their *Emergency Remote Teaching (ERT)* (Hodges et al., 2020) experiences during the period between March 2020 and June 2020, and each subsequent semester of teaching thereon until June 2021, across different course modalities for instruction and engagement. We treat these periods as different waves including pandemic-onset, peak-pandemic and post-lockdowns. The questionnaire elicits the course modality of instruction, pertaining to the semester we inquire about, in order to reflect differences across institutional policies around teaching.

### Participant Overview

In the U.S. a total of 22 faculty at the University of Michigan (U of M) responded to the instructor questionnaire and reported they taught at least one course during the period of interest. A total of 29 responses were collected from instructors in China meeting the same criteria, and the open-ended responses were processed by means of translation and back-translation (91% reliability) before coding. Coding was done using validated English translations of responses.

Overall majority (53%) of respondents identified as male in our faculty sample set. In the U.S. dataset 13 (59%) and in the China dataset 14 (48%) respondents identified as male. A total of 41% (9) of the faculty respondents in the U.S. and 45% (13) in China identified as female. Two faculty respondents in the China dataset did not identify as male or female. The 22 faculty in the U.S. sample collectively represented 495 years of university teaching experience; and 29 in the China sample represented 521 years of university teaching experience. Combined, our data represents 1016 years of experience in teaching college students. Individually, the number of

years of experience among faculty respondents varied greatly. In the U.S. sample respondents' teaching experience ranged from 5 to 50 years; and in China the range was from 2 to 40 years. Half of the faculty respondents in the U.S. sample had over 20 years of university teaching experience, and a little over a third (36%) had over 30 years of experience. In the sample from China, 72% of the faculty respondents had below 20 years of teaching experience. The average number of years of teaching experience of faculty teaching in the U.S. was 22.5 years and in China was 17.9 years.

In both the U.S. and China samples, the majority of the faculty respondents taught between 1 and 2 courses each semester, primarily undergraduate classes and many teaching courses each of the three semesters. Across the three semesters of our inquiry, Tables 4.1 and 4.2 present the distribution of instructors by the reported number of courses they taught in the U.S. and China, respectively. About a third, a total of 8 (36%), faculty from the U.S. sample taught consistently across the three semesters our questionnaire asked about.

Table 4.1. Distribution of Instructors by Number of Courses Taught across three semesters in the U.S.

<b># of Courses Taught</b>	<b>Winter 19/20</b>	<b>Fall 20/21</b>	<b>Winter 20/21</b>
<b>1 Undergraduate course</b>	10	7	7
<b>2 Undergraduate courses</b>	2	2	1
<b>3 Undergraduate courses</b>	0	0	1
<b>1 Graduate course</b>	3	3	0
<b>2 Graduate courses</b>	1	1	0
<b>3 Graduate courses</b>	0	0	3

The following faculty departments were represented in the U.S. data - Psychology (59%), Education (18%), Business Administration (4.5%), Teacher Education (4.5%), Linguistics (4.5%) and Psychiatry (4.5%). In data from China the faculty responses represented departments of Psychology (76%) and Education (21%). Overall, the majority (70%) of faculty respondents were associated with the department of psychology. The remaining (2) faculty respondents who did not identify with a singular primary academic department represented the discipline of Social and Behavioral Sciences.

Table 4.2. Distribution of Instructors by Number of Courses Taught across three semesters in China

# of Courses Taught	Winter 19/20	Fall 20/21	Winter 20/21
<b>1 Undergraduate course</b>	20	15	11
<b>2 Undergraduate courses</b>	5	2	3
<b>3 Undergraduate courses</b>	0	0	1
<b>1 Graduate course</b>	13	6	15
<b>2 Graduate courses</b>	3	2	0
<b>3 Graduate courses</b>	0	0	3

**Course Level Data**

The total 199 courses reported in our sample from the U.S. and China, are heterogeneous in terms of types of courses and instructional modalities. Table 4.3 represents the distribution of courses across a range of types including undergraduate and graduate lectures, discussions and laboratory courses taught.

In the U.S. the largest representation (40.4%) among the taught courses in our sample are of type “Undergraduate Seminar with discussion” while in the dataset from China over 39.5%

are “Undergraduate lecture class in one section” type. Interestingly, we sample a few field experiences or other practical instruction and laboratory or methods courses in the China dataset.

Instructors were presented a set of seven (7) questions for each course they taught in a wave of teaching. A wave of teaching here refers to a combination of the teaching conditions - pandemic-onset, peak-pandemic and post-lockdowns, the number of undergraduate courses they taught and the number of graduate courses they taught. We examine the responses for each cycle of seven questions. In our questionnaire, after being asked to identify course type and modality of instruction, instructors were prompted to respond to rating questions about software, effort and quality of learning.

Table 4.3. Course Type Distribution - across the three semesters in U.S. and China

<b>Course Type</b>	<b>Number in U.S</b>	<b>Number in China</b>
<b>Undergraduate Seminar with discussion</b>	19	15
<b>Graduate Seminar with discussion</b>	2	25
<b>Undergraduate lecture class in one section</b>	10	60
<b>Undergraduate lecture class with multiple sections</b>	13	19
<b>Graduate lecture class with multiple sections</b>	3	11
<b>Graduate lecture class in one section</b>	0	13
<b>Field experiences or other practical instruction</b>	0	7
<b>Laboratory or methods course</b>	0	2
<b>Total Courses Reported across 3 semesters</b>	<b>47</b>	<b>152</b>

Table 4.4 depicts the different modalities of instruction for courses taught in different semesters. The distribution of modalities of instruction in the different semesters (Table 4.5) is indicative of differences in teaching approaches between the U.S. and China during the same

periods. Whereas a large share (48.8%) of courses taught during the post-lockdowns period from our sample in China were in-person, all the courses in the same period were taught online in the U.S. None of the courses reported in the U.S. dataset were taught in-person during the period of interest. The number of courses taught online decreased in the sample from China from 44 in the pandemic-onset (first) semester to 19 in the third semester (Winter 20/21). In the U.S. we see the opposite trend with online instruction showing up in more courses in the third semester (7 to 15).

Table 4.4. Course Instruction Modality Distribution - across the three semesters in U.S. and China

Country	Modality	Winter 19/20 pandemic-onset	Fall 20/21 peak-pandemic	Winter 20/21 post-lockdowns
U.S.	In-person	0	0	0
U.S.	Hybrid	9	2	0
U.S.	Online	7	13	15
China	In-person	5	20	21
China	Hybrid	12	6	3
China	Online	44	16	19

The cycle of questions include open-ended questions such as 1) What are the main challenges you face teaching this course? and 2) What would you do differently in teaching this course online again? The responses to these questions provide a qualitative window into instructors' perspectives and instructional changes.

### Instructional Changes

After the process of (a) data cleaning, (b) translation of Chinese to English and back-translation from English to Chinese, and (c) close reading of the English text, eight high

level mutually non-exclusive codes for *Instructional Changes* were identified, combining Communication and Interaction as depicted in Table 4.5 mapped to the Interaction Modality Communication (IMC) Conceptual Model (described in Chapter 2).

Multiple steps were involved in ensuring validity and reliability of the coding activity. After the step of identifying the set of eight categories of instructional changes by a single coder's examination of a subset of open-ended responses, mainly the U.S. sample, a codebook was developed (Appendix 1 - Instructional Change Category Codebook), complete with definitions and anchor examples to support the process of coding the remainder of the dataset. The instructional technology background and research methods' training of the initial coder was useful in interpretation of textual responses about challenges and changes to extrapolate the intended variable - instructional changes.

The coding process was repeated following a multi-reader protocol with the remaining dataset, including the responses from the China group. Three coders were involved in close reading and qualitative analysis of the open-ended responses with an inter-rater reliability (IRR) of 93% using the instructional change category codebook.

### ***Underpinnings***

Although the qualitative themes are emergent, the underlying concepts are mapped onto the IMC conceptual model. Category descriptions draw upon the narrative and conversational interaction types underpinning our IMC Conceptual Model. The *Modality* dimension is used to associate emerging categories with course instruction across the three named modalities - In-person, Online and Hybrid. Themes showing up across multiple *Modality* boxes in the IMC Conceptual Model enable us to delineate lasting effects on instruction, as they are not restricted to any one modality or semester.

Table 4.5 presents the results of the thematic analysis of instructional changes named in faculty responses to open-ended questions - Synchronous Discussions, Synchronous Lectures, Pre-Recorded Lectures, Informal Asynchronous Discussions, Synchronous Assessment, Asynchronous Assignments, Asynchronous Materials and Synchronous Group Discussions.

Table 4.5. Thematic Analysis - Categories of Instructional Changes

<b>Category</b>	<b>Description</b>
<b>Synchronous Discussions</b>	Involving live video conferencing with students and instructors connected remotely using online technology for class discussions
<b>Synchronous Lectures</b>	Involving lecture instruction using video conferencing whereby students are connected with the instructor using online technology
<b>Pre-Recorded Lectures</b>	Involving lectures delivered using online technologies to students to watch at their own pace
<b>Informal Asynchronous Discussions</b>	Involving outside-of-class interactions among students or between students and instructors such as virtual office hours
<b>Synchronous Assessment</b>	Involving assessments in synchronous class sessions as indication of engagement such as of student virtual attendance or participation
<b>Asynchronous Assignments</b>	Involving assessment of coursework to work on outside of synchronous sessions including flipped classroom style work
<b>Asynchronous Materials</b>	Involving engaging students in instructional materials in asynchronous formats to work on outside of class sessions including flipped classroom style work
<b>Synchronous Group Discussions</b>	Involving engaging students in synchronous discussions in groups to promote student relationship building and interactions, and engage with instructional materials

These eight (8) instructional change categories are drawn by mapping embedded interactions elements to the Laurillard conversational framework (2002) interaction types - narrative or conversational (Table 4.6); and the embedded characterization as Asynchronous or Synchronous, used as the first descriptor word in the category theme, are derived from the



definitions of modes of communication laid out by Hrastinski (2008). Asynchronous is different from synchronous in terms of critical time-bound constraints on interaction and the need for online real-time communication using formats such as video-conferencing, audio-conferencing or chat.

Each of the instructional change themes is classified into one of two types of interaction: conversational and narrative. We define conversational and narrative interaction types by extending the *Conversational Framework* developed by Laurillard (2022). Narrative interactions involve storytelling or narrative-based activities, where teachers or students share stories, anecdotes, or examples to illustrate concepts, convey experiences, or engage in reflection. Conversational interactions refer to the back-and-forth exchanges, discussions, or dialogues between teachers and students, or among students themselves, and are characterized by active participation, questioning, elaboration, and negotiation of meaning.

Each of the categories are individually associated with either conversational or narrative interaction types. Let us take for example Synchronous Discussions; these refer to the video conferencing activity between instructors and students, involving bidirectional interactions meaning these are conversational.

On the other hand, Synchronous Lectures or Pre-Recorded Lectures are considered as unidirectional generally, even if they involve opportunities for latent feedback such as offline feedback forms or forums to ask questions; and therefore are classified as mediating narrative types of interactions. A total of 146 instructional changes were identified from instructors' responses across 199 courses taught at universities in the U.S. and China during the period encompassing the pandemic-onset, peak-pandemic and post-lockdowns. The larger proportion (62.3%) of changes were represented in the sub-set of responses from China.

Table 4.6. Mapping of Themes to Instructional Change Interaction Categories

<b>Category Mapping to Interaction Types</b>	<b>Instructional Change Category</b>
<b>Conversational</b>	Synchronous Discussions
<b>Conversational</b>	Informal Asynchronous Discussions
<b>Conversational</b>	Synchronous Assessment
<b>Conversational</b>	Synchronous Group Discussions
<b>Narrative</b>	Pre-Recorded Lectures
<b>Narrative</b>	Synchronous Lectures
<b>Narrative</b>	Asynchronous Assignments
<b>Narrative</b>	Asynchronous Materials

Table 4.7 illustrates the instructional changes reflected in a singular instructors' responses from the China sample about teaching courses of type 'undergraduate lecture class in one section' in online and hybrid modalities. *Modality* is ascribed using data elicited from the response about 'how the course was taught?'. Themes appearing across modalities can be interpreted as possibly persisting across semesters and therefore can be seen as lasting instructional changes.

Table 4.7. Example: Instructional Changes in analysis of an instructors' responses (China sample)

Dimension	Modality			
Interaction				Communication
	in-person <sup>1</sup>	online <sup>1</sup>	hybrid <sup>1</sup>	
Narrative <sup>3</sup>		pre-recorded lectures		Synchronous or Asynchronous <sup>2</sup>
Conversational <sup>3</sup>		asynchronous materials	asynchronous materials	Synchronous or Asynchronous <sup>2</sup>
	in-person <sup>1</sup>	online <sup>1</sup>	hybrid <sup>1</sup>	

<sup>1</sup> definitions of in-person, online and hybrid teaching modes from College of Literature, Science and the Arts (UofM) as modality

<sup>2</sup> definitions of synchronous and asynchronous communication in learning contexts drawn from Hrastinski (2008) modes of communication

<sup>3</sup> definitions of narrative and conversational interactions in a classroom context drawn from Laurillard Conversational framework (2002)

A total of 44 out of the 51 respondents in our sample reported teaching courses in the first semester during the pandemic-onset (referred to as the second semester of the academic year 2019-2020 in the questionnaire), 35 in the second semester in the peak-pandemic period (referred to as the first semester of academic year 2020-2021) and 30 in the third semester coinciding with the period of post-lockdowns (referred to as the second semester of academic year 2020-2021).

In courses reported in the U.S. sample, Synchronous Discussions were chief among the named instructional changes. Asynchronous Materials and Asynchronous Assignments feature as the next two in rank order. In courses in China, Synchronous Lectures, Asynchronous Materials and Synchronous Group Discussions were reported as the top three categories of instructional changes. Pre-Recorded Lectures, Synchronous Participants Assessment and Informal Asynchronous Discussions featured at lower rates in both the U.S. and China sample of courses.

Figure 4.1. U.S.: Instructional Changes - Category Distribution

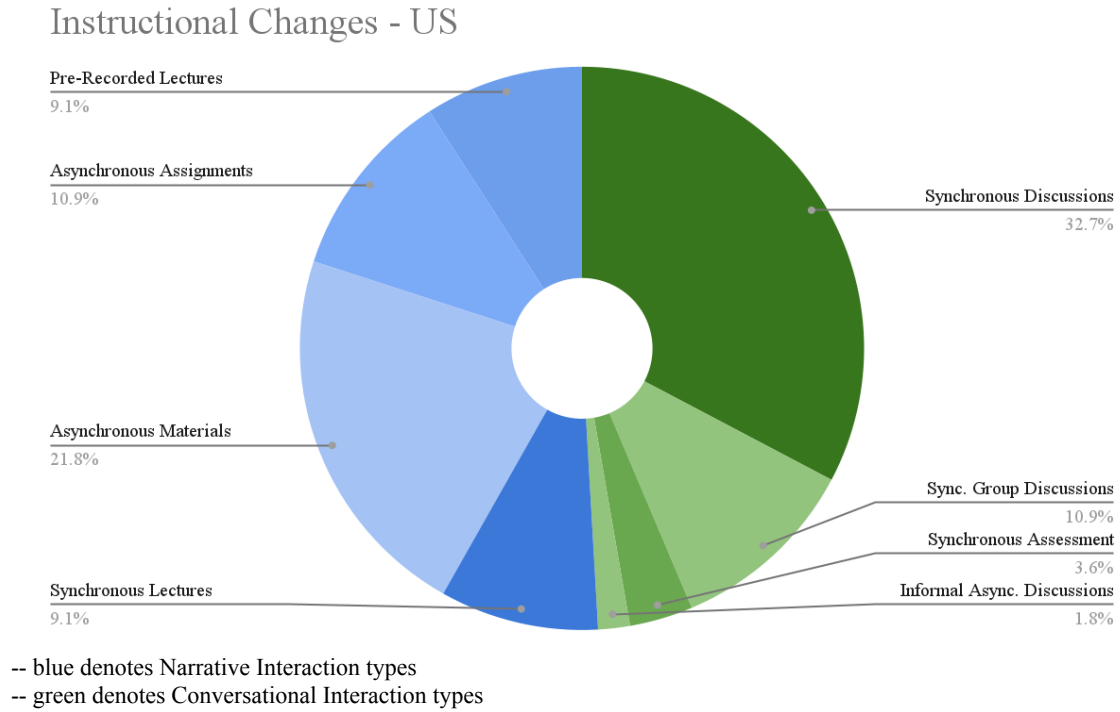
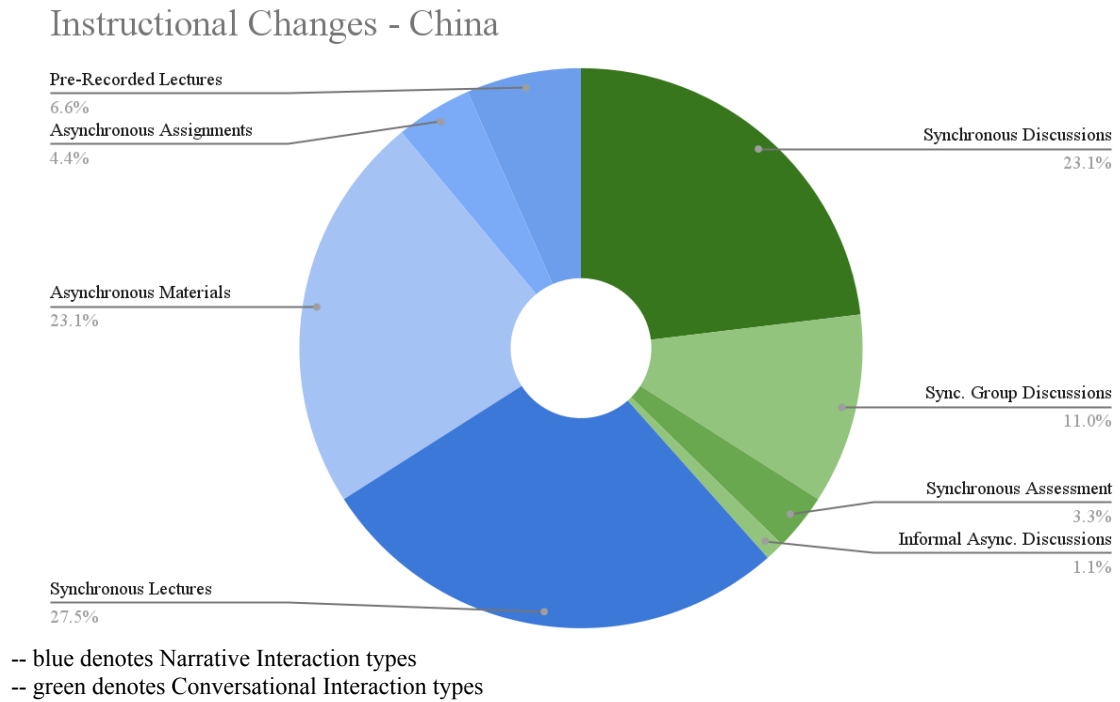


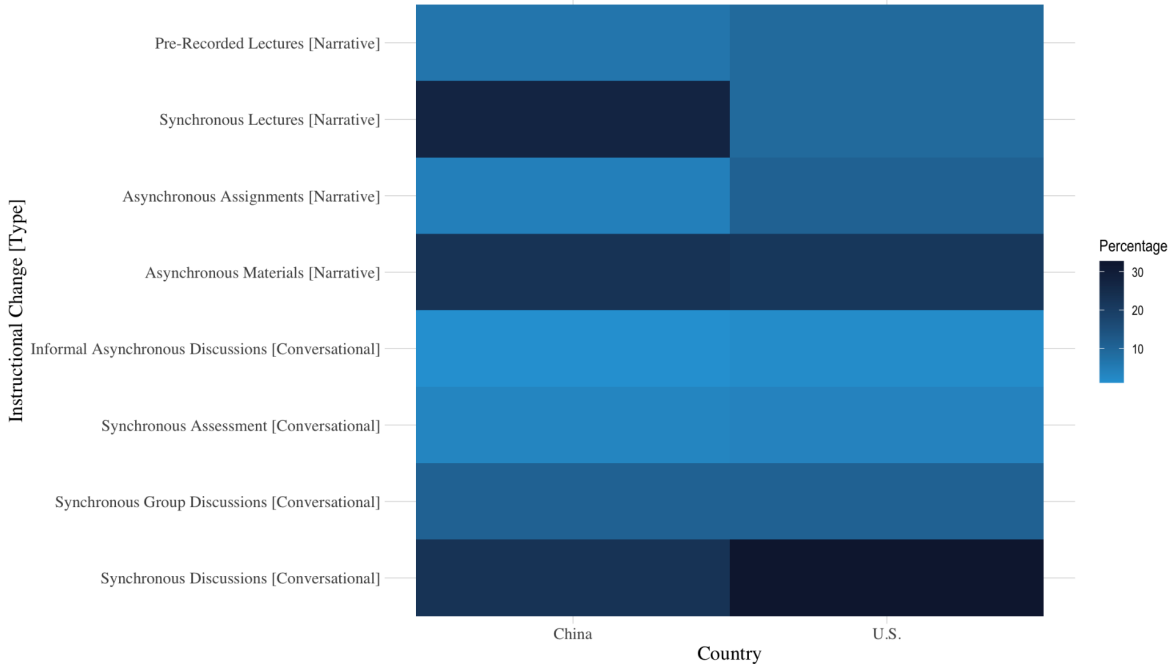
Figure 4.2. China: Instructional Changes - Category Distribution



Figures 4.1 and 4.2 represent the category distribution of instructional changes in courses in the U.S. and China respectively. Figure 3.3 uses a heat map to provide a comparative representation of change categories in courses in the U.S. and China.

The heat map (Figure 4.3) represents the intergroup comparison of instructional changes and indicates a more dominant presence of *narrative interactions* relative to *conversational interactions* overall among the 146 instructional changes reported in our dataset (55 in the U.S. sample and 91 in the China sample).

Figure 4.3. U.S. and China Instructional Changes - Categories Heat Map



Overall the majority of reported changes are narrative interaction oriented changes (57.53%), but the distribution of narrative and conversational interactions differed between the two countries. As presented in Table 4.8.1, a larger proportion of narrative interactions (61.5%) relative to conversational interactions (39.5%) showed up in the instructional changes made by instructors in China. But the proportions of narrative interactions (50.91%) and conversational interactions (49.09%) were more balanced in responses from faculty in the U.S.

Table 4.8.1. U.S. and China Ingroup Interaction types and Instructional Changes

Interaction Type	Instructional Change	% China (ingroup)	% U.S. (ingroup)
Conversational	Synchronous Discussions	23.08%	32.73%
	Synchronous Group Discussions	10.99%	10.91%
	Synchronous Assessment	3.30%	3.64%
	Informal Asynchronous Discussions	1.10%	1.82%
Narrative	Asynchronous Materials	23.08%	21.82%
	Asynchronous Assignments	4.40%	10.91%
	Synchronous Lectures	27.47%	9.09%
	Pre-Recorded Lectures	6.59%	9.09%

Table 4.8.2 represents the distribution of the instructional changes by category and in relation with the number of instructors at each institution in the U.S. and China. In terms of coverage of instructional changes relative to the number of instructors in each sample we found Synchronous Discussions topped the list in the U.S. (81.82%) whereas Synchronous Lectures topped in China (86.21%).

The results of intergroup analysis show narrative interactions occurred twice as many times in the sample of instruction in China (66.67%) as compared to instruction in the U.S (33.33%). These were in the form of 63.64% Asynchronous Materials, 83.33% Synchronous Lectures and 54.55% Pre-Recorded Lectures, with the exception of Asynchronous Assignments. The difference between U.S. and China in terms of narrative interaction type preferences was found to be significant (*Fisher's exact test of count data*,  $p < .05$ ) (Appendix 2).

Table 4.8.2. U.S. and China Ratio of Instructional Change by Type to Instructors

Instructional Change	China	U.S.	BNU Ratio (out of 29)	UofM Ratio (out of 22)
<b>Synchronous Discussions</b>	21	18	<b>72.41%</b>	<b>81.82%</b>
<b>Synchronous Group Discussions</b>	10	6	34.48%	27.27%
<b>Synchronous Assessment</b>	3	2	10.34%	9.09%
<b>Informal Asynchronous Discussions</b>	1	1	3.45%	4.55%
<b>Synchronous Lectures</b>	25	5	<b>86.21%</b>	22.73%
<b>Asynchronous Materials</b>	21	12	<b>72.41%</b>	<b>54.55%</b>
<b>Asynchronous Assignments</b>	4	6	13.79%	27.27%
<b>Pre-Recorded Lectures</b>	6	5	20.69%	22.73%

Majority of instructors in China (76%) taught multiple semesters, and 63% of those taught courses in the first semester taught in succession across the three semesters. In the U.S. sample also the majority (52%) taught multiple semesters with about 47% of those who taught the first semester taught in succession into the pandemic post-lockdowns period. Asynchronous Materials, Synchronous Discussions, Pre-recorded Lectures, Synchronous Group Discussions and Asynchronous Discussions showed up in courses across multiple semesters in succession. In China Synchronous Group Discussions came up six times in three distinct courses taught in succession in different modalities - online and in-person.

Instructors named several software technologies in the courses reported on in their responses. These included Zoom, Canvas, Tencent (WeChat, QQ), Kaltura, Google docs, Microsoft Powerpoint, Qualtrics, Blackboard, Camtasia, Youtube, unspecified “Recording

software”, Piazza, Padlet, Jamboard, Trello, Miro and Arduino. The top three software applications featured in the responses were Zoom (33.33%), Canvas (22.42%), Tencent (15.15%) across courses taught in the U.S. and China, combined. A majority of the courses in the reported sample were lecture courses (107). Some instructors identified recording software (14) used in their courses. The use of WeChat features only in courses in the sample from China and Google Docs features only in the sample from the U.S. Although technology access and software are both important aspects of instruction, because the focus is on examining the instructional changes and approaches we examine instructors’ perceptions about instructional aspects in different conditions.

### **Operationalizing Instructional Perspectives**

We collected data on 32 variables (Appendix 3). Using 11 variables we filtered our findings in order to (1) examine the connection between effort and continued use of change, (2) contrast the perceptions of student engagement and student learning and (3) measure the weight of effort on instructors’ perceptions.

Instructor ratings are collected using a likert scale of Very High to Very Low (in numbers from 5 to 1, with 5 being Very High and 1 being Very Low) on the following aspects of in each cycle of teaching (per course, per wave):

- (1) Effort Teaching
- (2) Effort Monitoring
- (3) Understanding Student Learning
- (4) Student Engagement
- (5) Student Workload
- (6) Peer to peer



(7) Student Motivation

(8) Student Attendance

(9) Quality of student learning

Ratings, across nine variables, juxtaposed with modality of the course can be helpful measures to explain some of the reasons instructors made and kept some of their ERT instructional changes because these can be related to their underlying beliefs and attitudes around technology and change. Technology acceptance relates to the degree and quality of adoption. Davis (1989) operationalized the technology acceptance model (TAM) in terms of (a) perceived usefulness and (b) perceived ease of use. Instructors' ratings about aspects of instructional approaches can indicate their perceptions of usefulness and ease of use of such approaches. In the context of instruction we can map perceived usefulness (PU) to the combination of perceptions of Student Engagement, Peer to peer, Student Motivation, Student Attendance, Quality of student learning; and perceived ease of use (PEU) to instructors' perception of efforts involved, such as Effort Teaching, Effort Monitoring, and Understanding Student Learning.

Instructor ratings are associated with each course across three semesters - waves, categorized by course modality (Online, In-person and Hybrid). Results from the U.S. are depicted in Figures 5 to 9 and results from instructors in China are presented in figures 10 to 18. Because of the small number we chose not to separate instructor ratings across course-levels, and we combined graduate and undergraduate course ratings to assess the range of perceptions. The nine ratings variables are grouped into two categories of course measures - measures of instructional effort and (perceptions of) student learning measures. These are represented along the y-axis and the distribution of ratings, in terms of ratio, is presented along the x-axis. Each figure is differentiated in terms of the wave of teaching and modality of instruction. Measures of

effort - Effort Teaching, Effort Monitoring and Effort Understanding Student Learning are grouped as indicators of Perceived Ease of Use. Measures of student learning are grouped as indicators of Perceived Usefulness.

Figure 4.4. U.S. Semester 1 Hybrid Course Measures

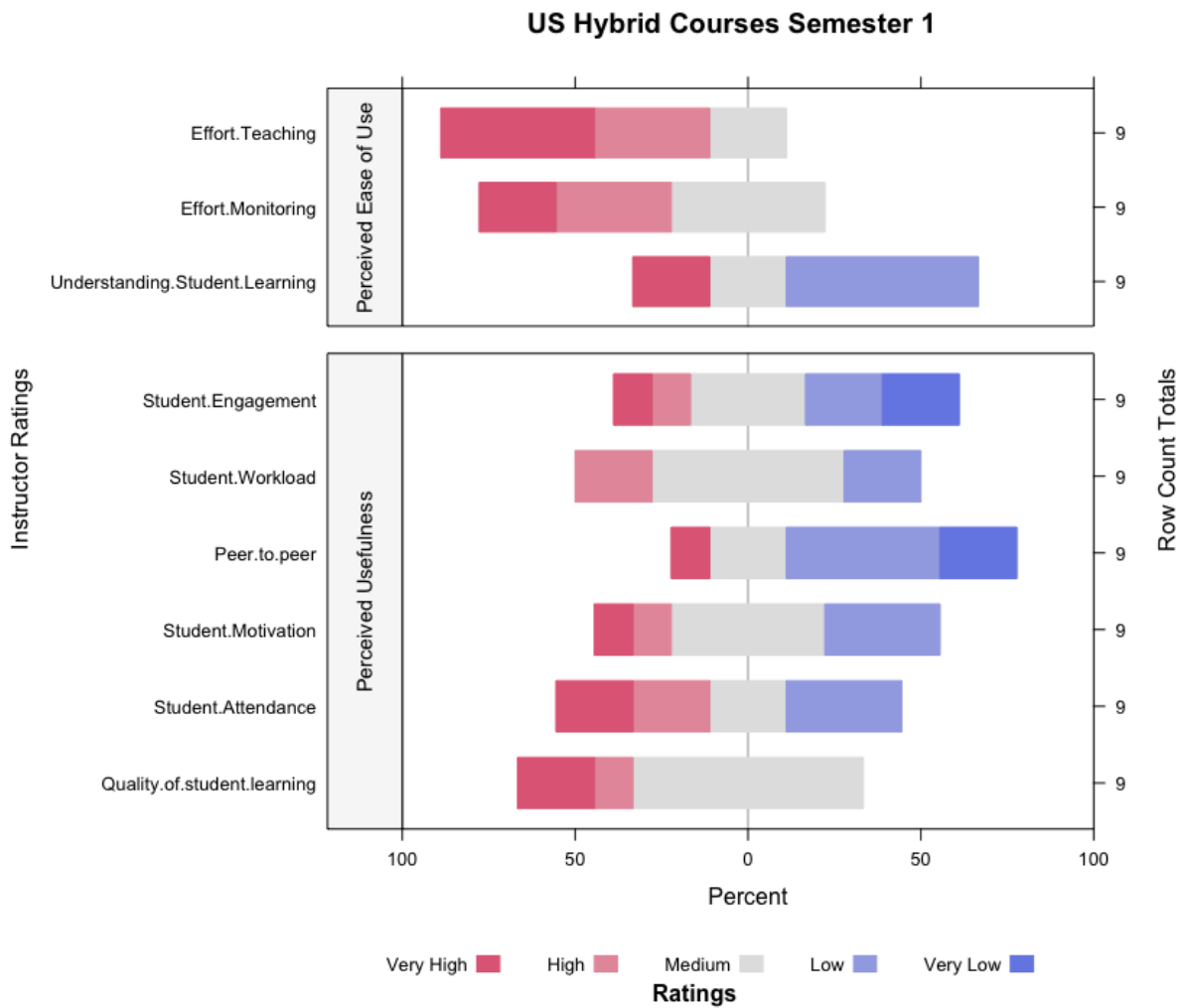
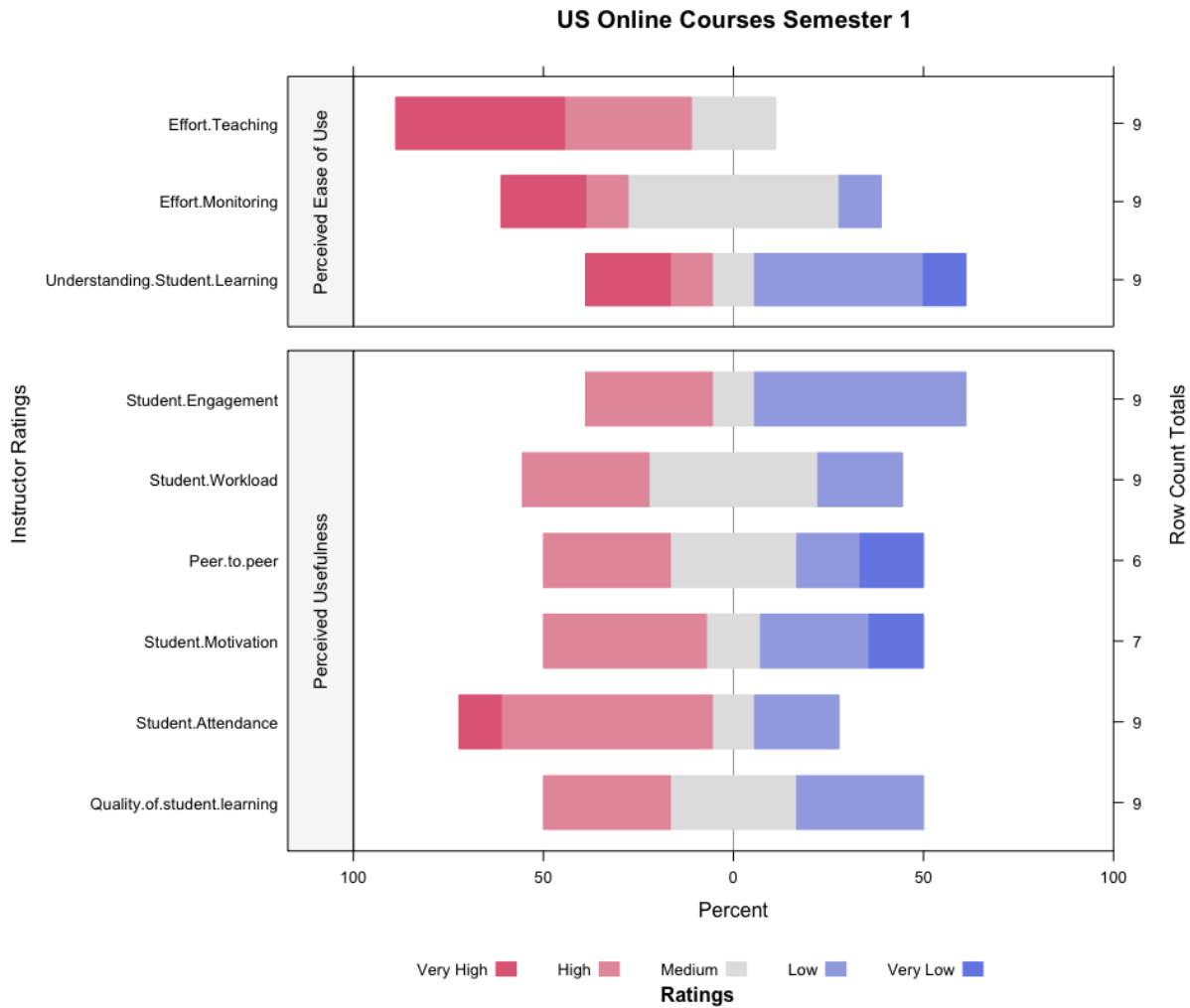


Figure 4.5. U.S. Semester 1 Online Course Measures

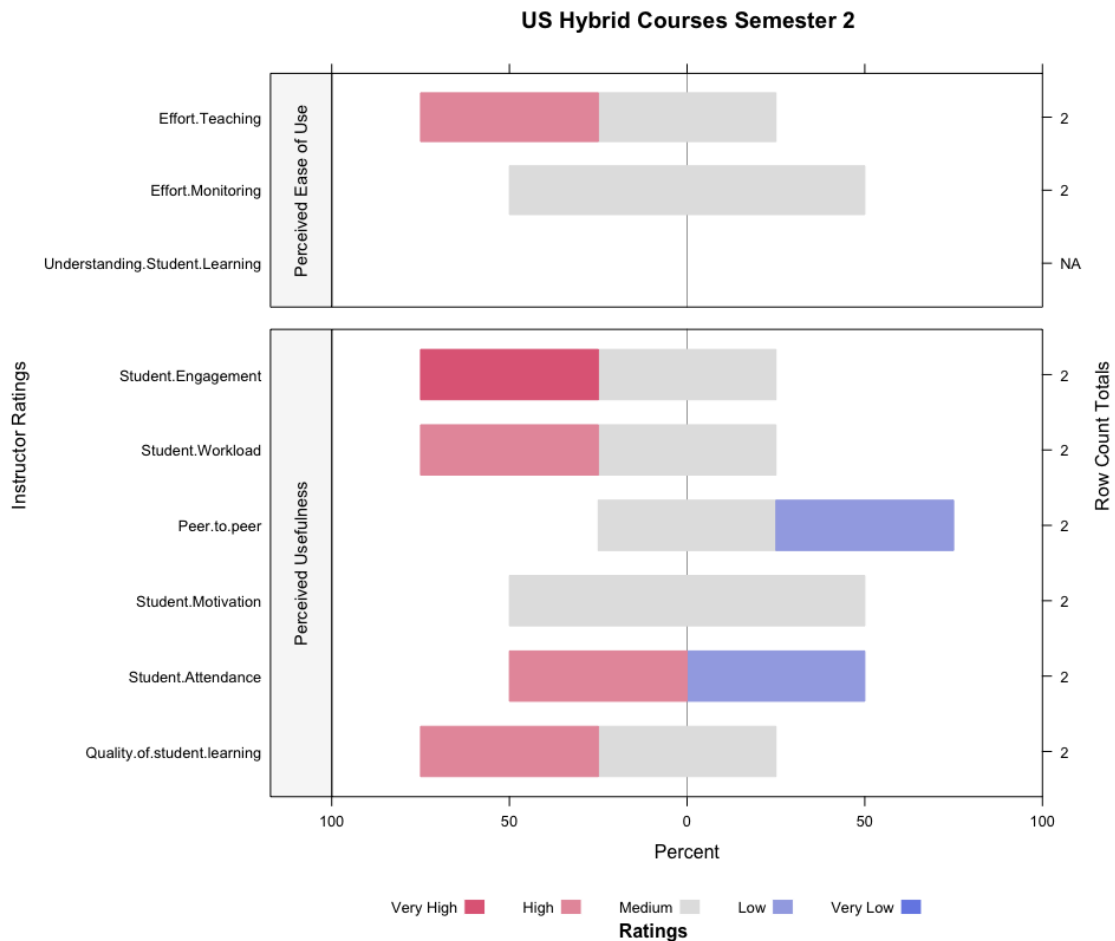


Figures 4.4 and 4.5 represent the U.S. faculty ratings on course measures from their first semester of experiencing ERT in the middle of the semester of teaching (January 2020 to April 2020). In the pandemic-onset semester of ERT and teaching hybrid modality, the majority of faculty reported they felt they spent higher amounts of effort (a) teaching (78%) and (b) monitoring students (56%); But a majority (56%) reported relatively low effort spent in understanding student learning.

Majority instructors in the U.S. share (66%) reported low peer-to-peer interactions and 44% low student engagement in hybrid formats. A larger proportion (56%) reported feeling

student engagement was low in online courses. Instructors' ratings were more in the middle for perceptions of student workload and quality of student learning in teaching online; 33% of faculty perceived quality of student learning as medium, 33% perceived it as high while another 33% perceived the quality of student learning as low.

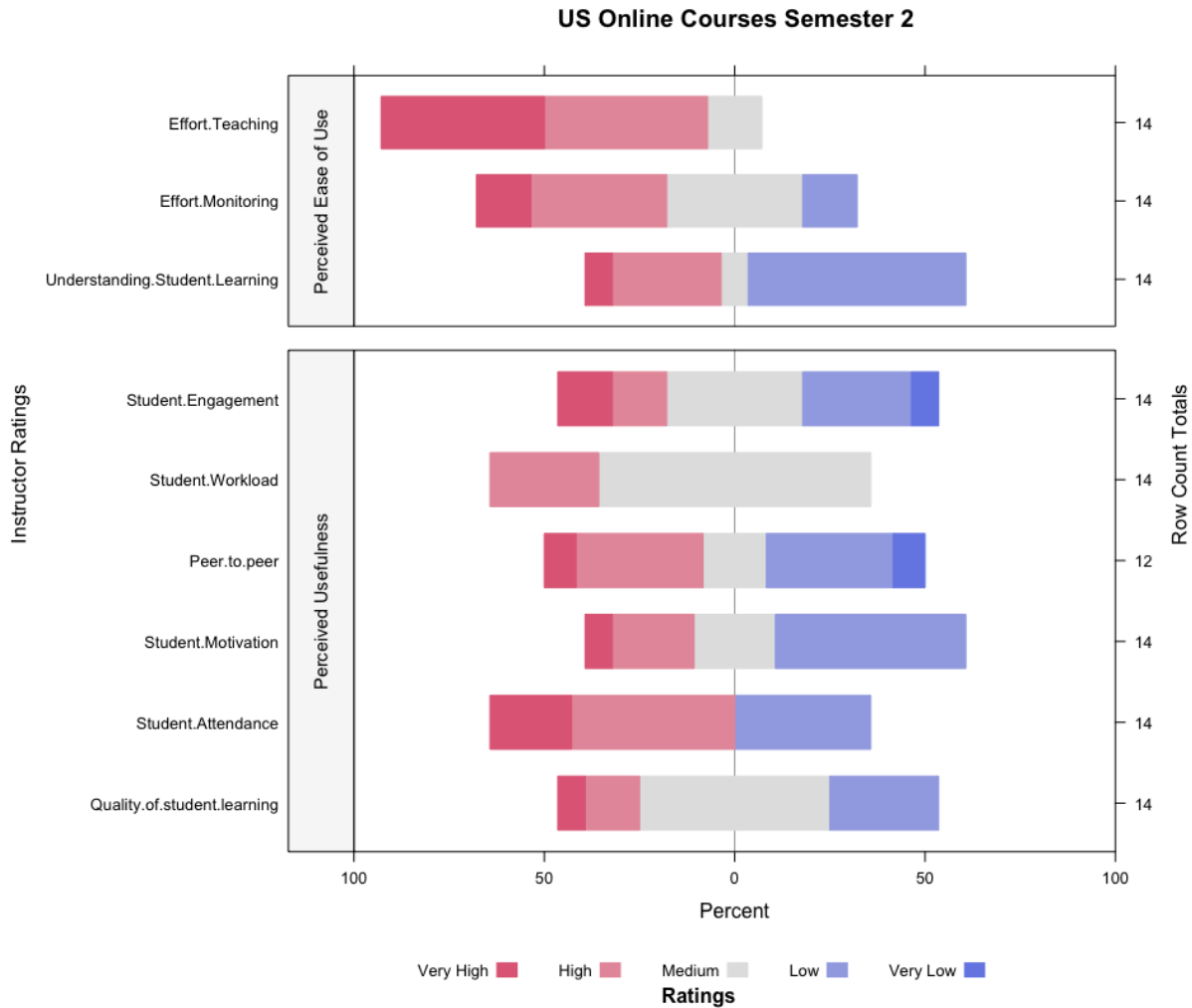
Figure 4.6. U.S. Semester 2 Hybrid Course Measures



Teaching effort was perceived as high or very high by many instructors in the U.S. in the first semester of teaching across both online (78%) and hybrid (78%) teaching modalities. A majority (56%) of instructors reported student engagement as low or very low in online courses in the pandemic-onset period. Measures of student learning such as attendance, quality of student learning, and student motivation were rated considerably higher in hybrid courses as compared to

online courses' instruction by instructors in the U.S. with the exception of peer-to-peer interactions rated low by a majority (67%) of instructors.

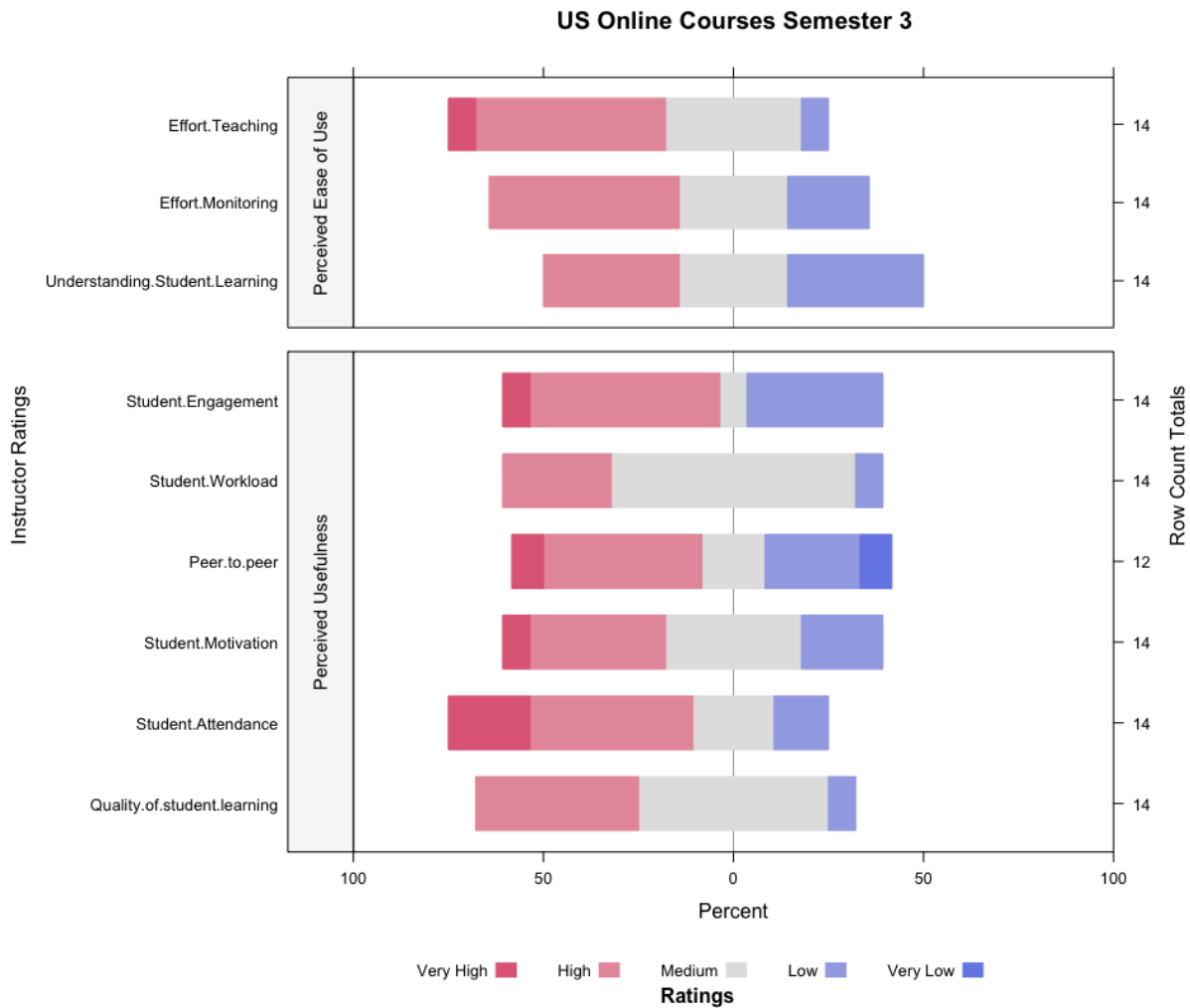
Figure 4.7. U.S. Semester 2 Online Course Measures



In the second semester, not many (2) hybrid courses in the U.S. were reported on and none in the third semester. Figures 4.6 and 4.7 represent the second semester of instruction in the U.S. and Figure 4.8 is the third semester of teaching online in the U.S. Overall, we saw a consistent decrease in measures of teaching effort and increment in average student engagement measures (27% to 50%) in the U.S. across the three semesters independent of the modality of

instruction. In the U.S. the trend for measures of student learning were incrementally positive between the three semesters, independent of the modality of instruction.

Figure 4.8. U.S. Semester 3 Online Course Measures



Figures 4.9, 4.10 and 4.11 represent the courses reported in China during the first semester of ERT. A majority (56%) of faculty reported high effort measures (associated with perceived ease of use) in hybrid ERT during the pandemic-onset semester. In China a large share of faculty who taught hybrid courses (75%) reported higher *Teaching Effort* as did 53% who taught courses in online modality (Figure 11).

Figure 4.9. China Semester 1 Online Course Measures

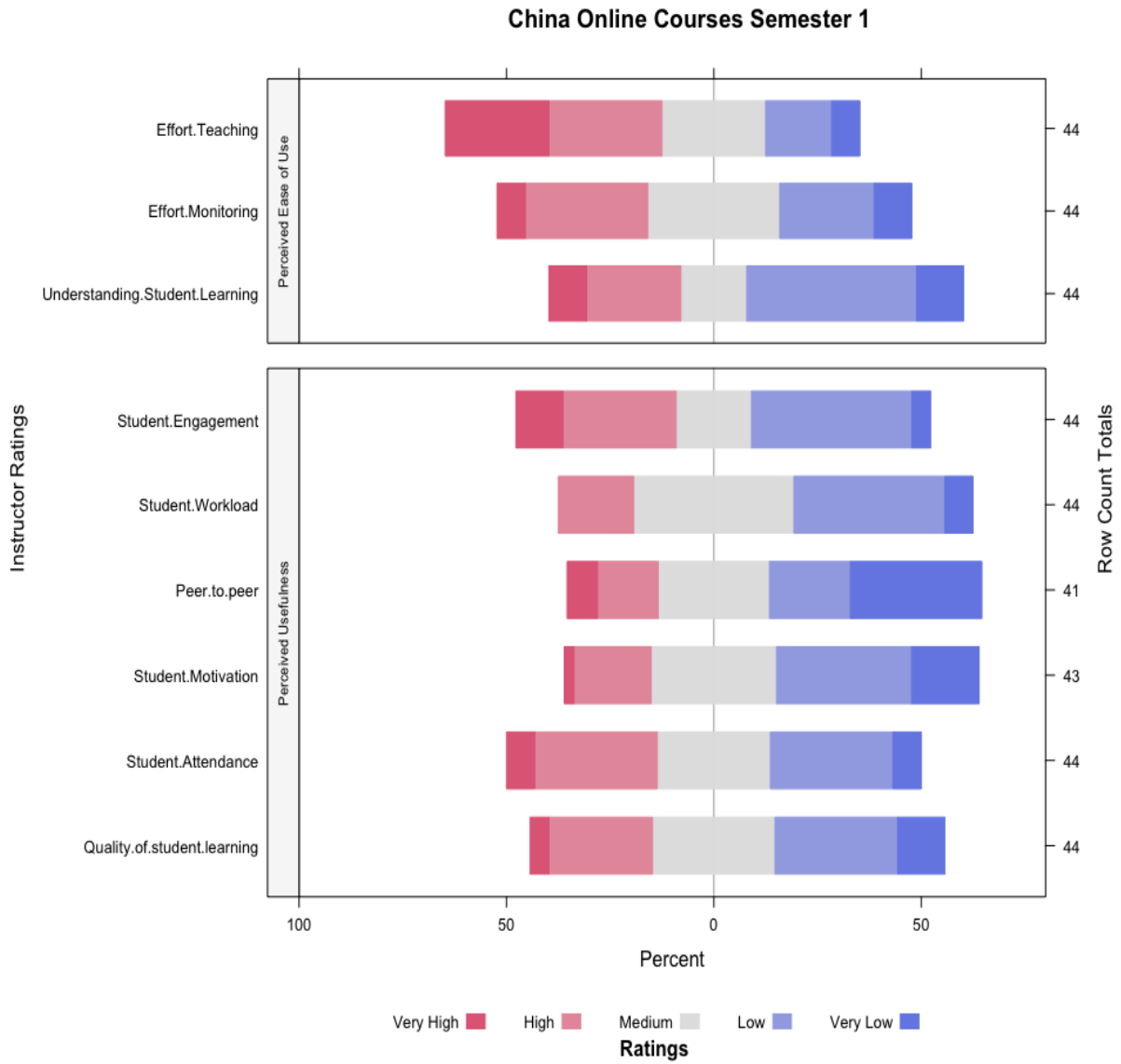


Figure 4.10. China Semester 1 Hybrid Course Measures

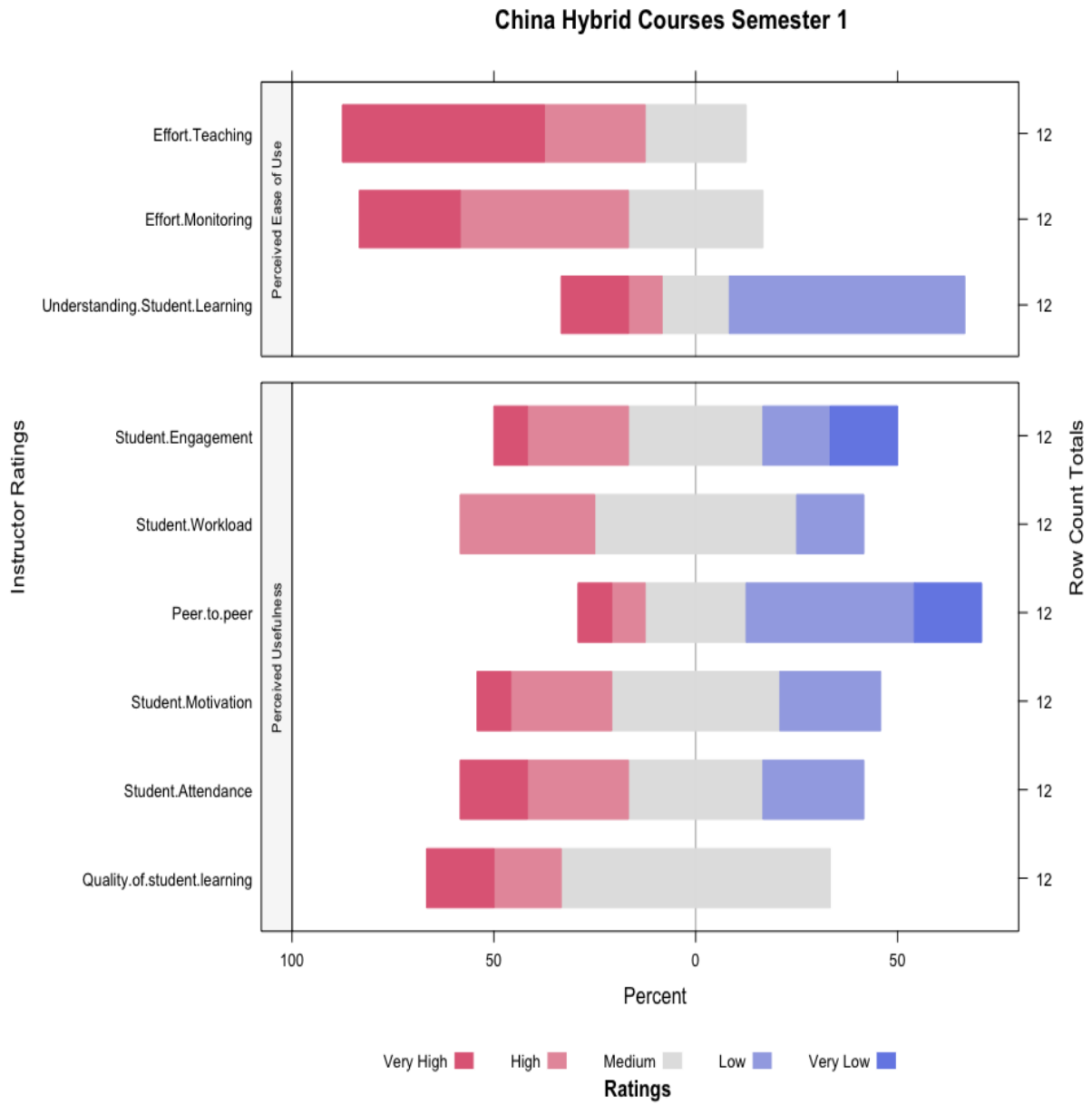
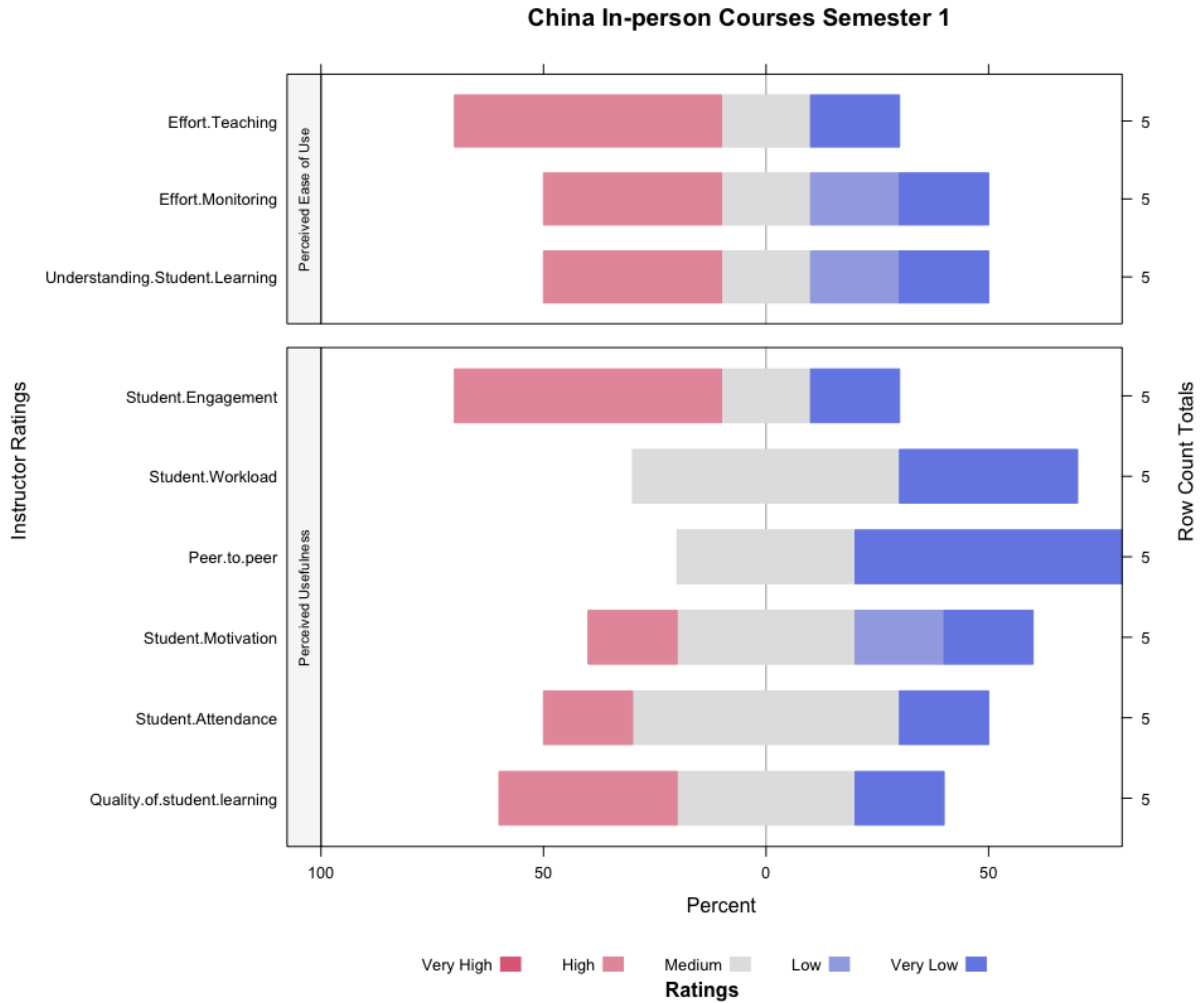




Figure 4.11 China Semester 1 In-person Course Measures



In China, measures of teaching effort were marked high in the second semester of ERT - effort teaching (87.6%) and effort monitoring students online (56.3%). Student Motivation was perceived as low to very low by instructors teaching online (43.8%) and in-person (40%).

In the third semester, faculty in China reported on a few (3) hybrid courses. Figures 4.12, 4.13, and 4.14 in China for the second semester, overlapping with August 2020 to December 2020 during the peak-pandemic period.

Figure 4.12. China Semester 2 Online Course Measures

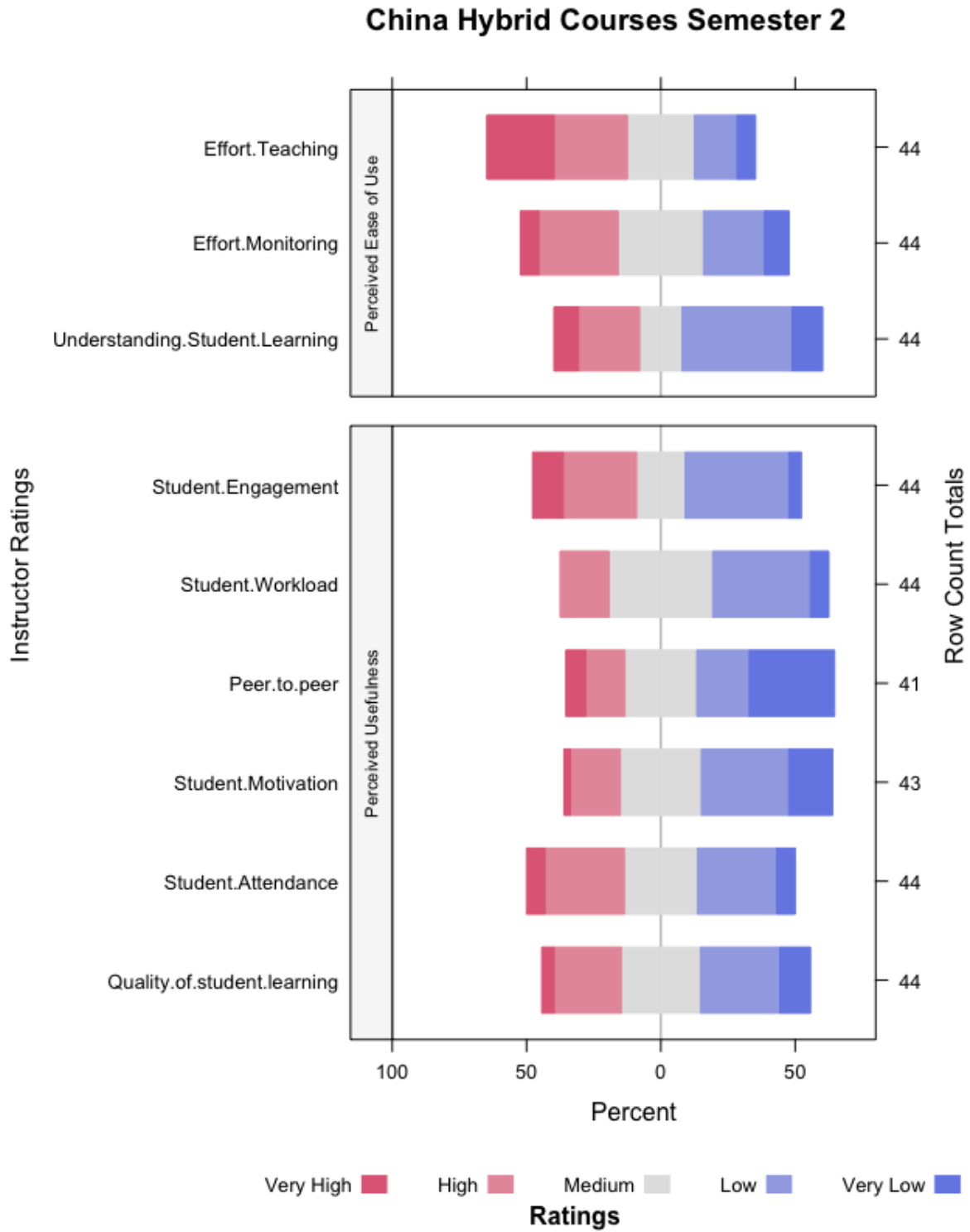


Figure 4.13. China Semester 2 Hybrid Course Measures

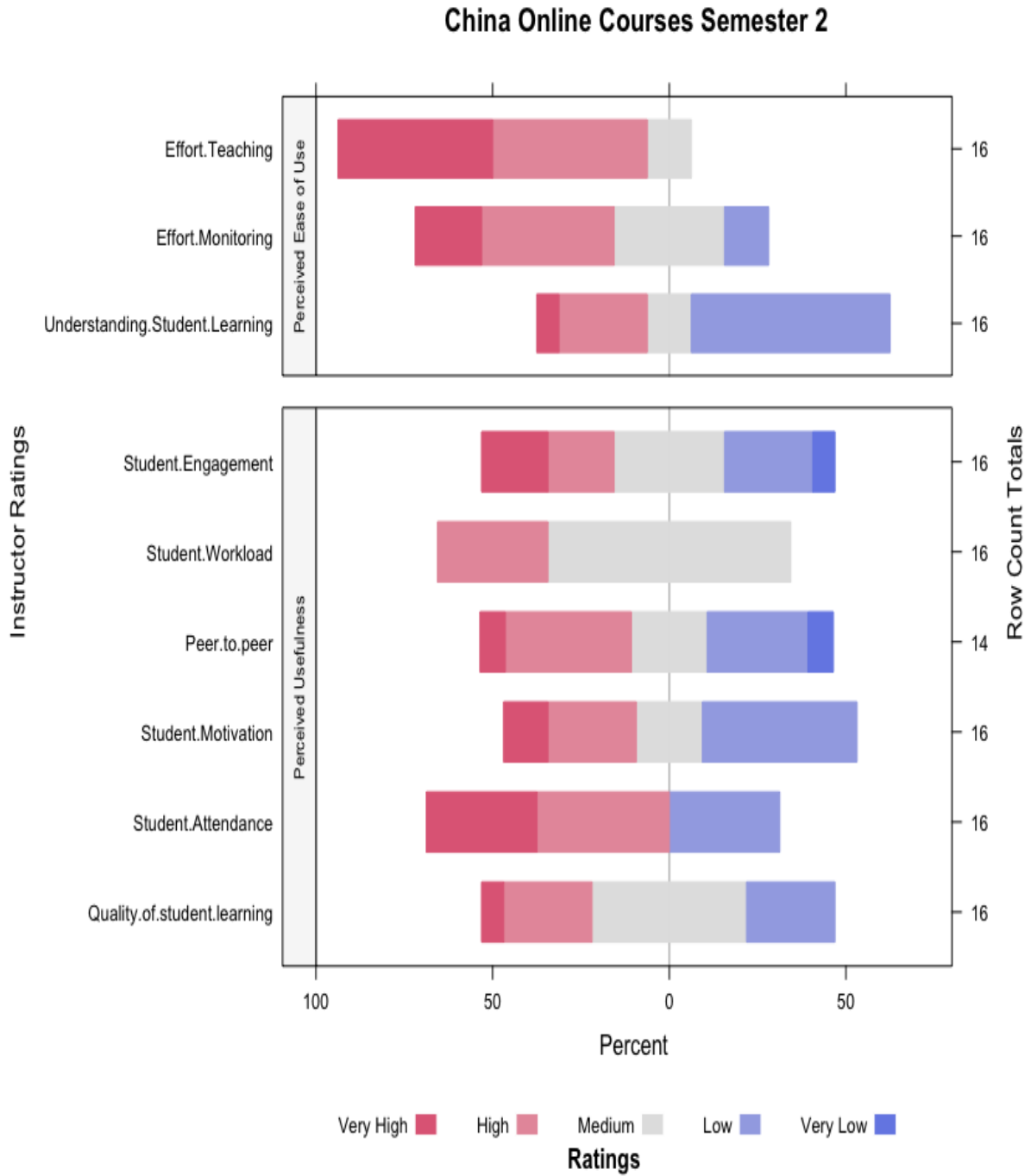


Figure 4.14. China Semester 2 In-person Course Measures

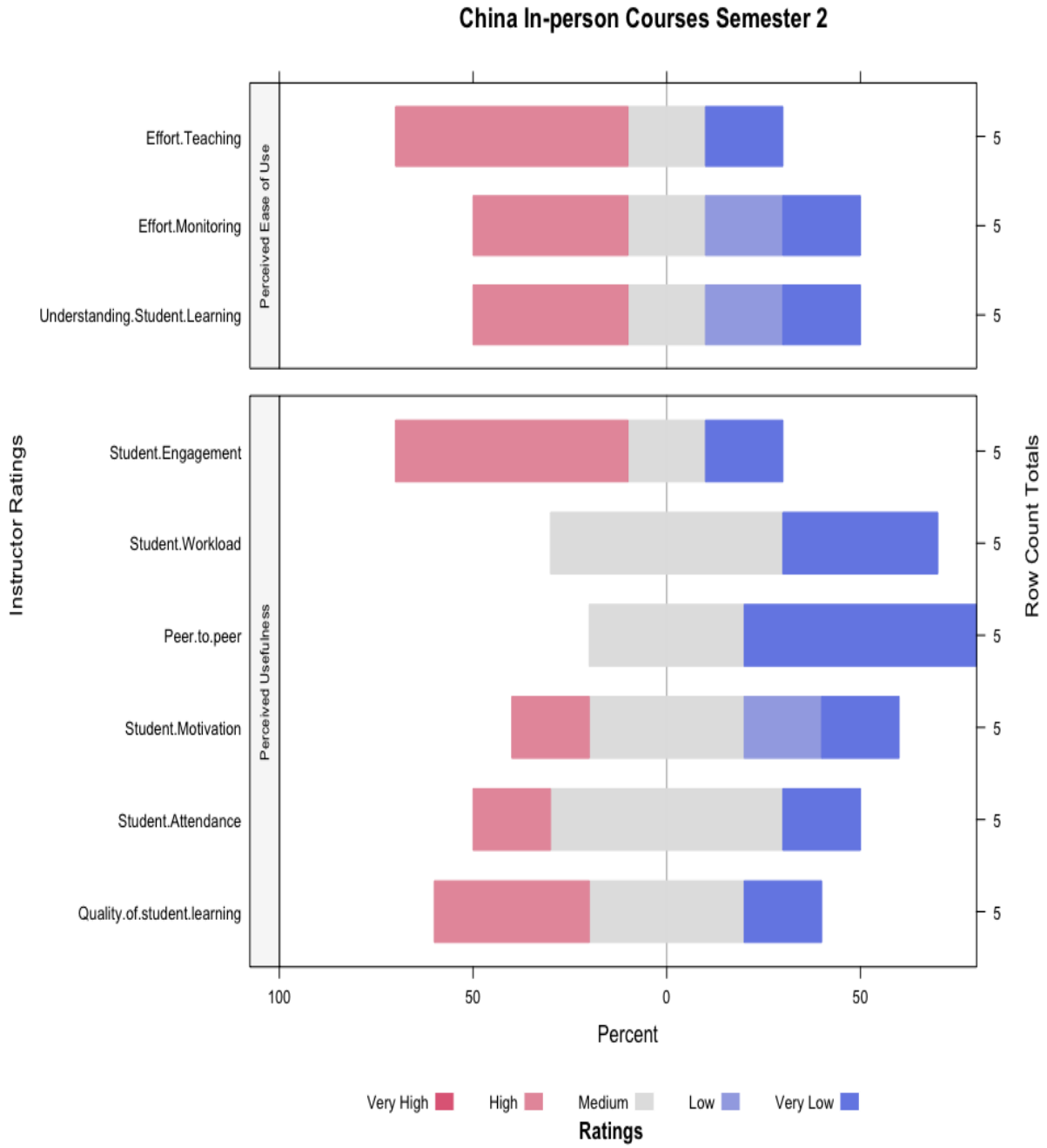


Figure 4.15. China Semester 3 Online Course Measures

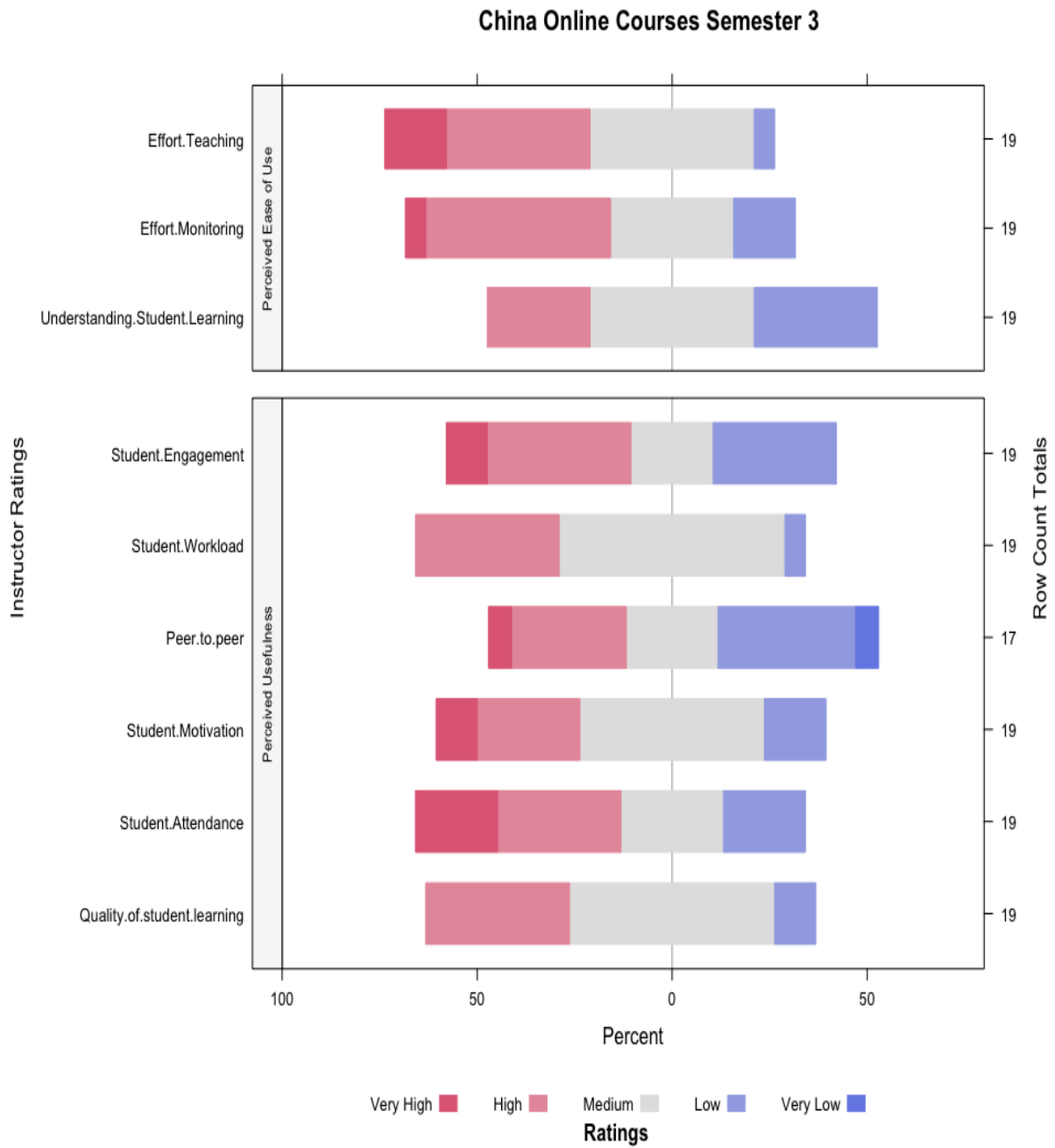


Figure 4.16. China Semester 3 Hybrid Course Measures

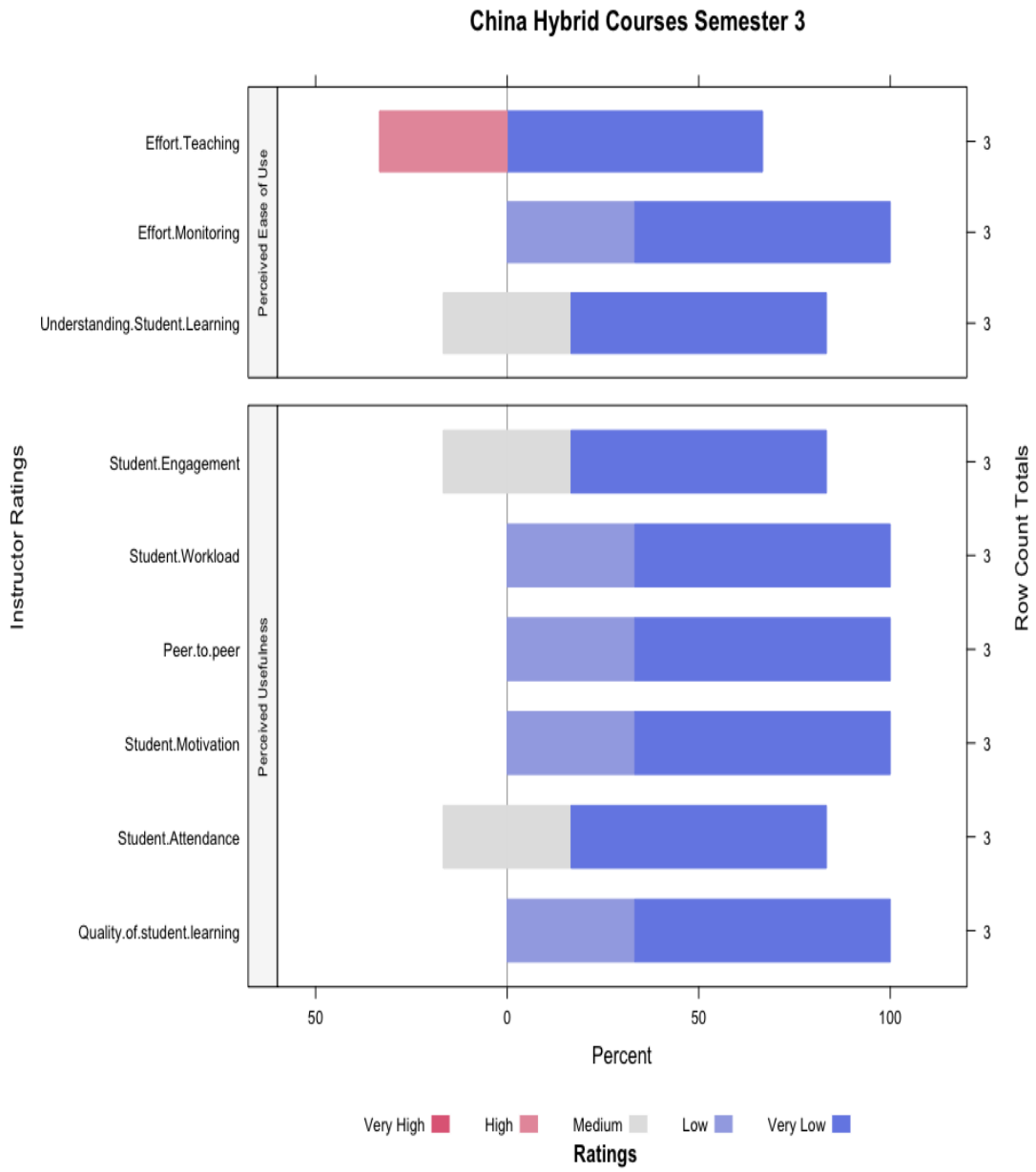
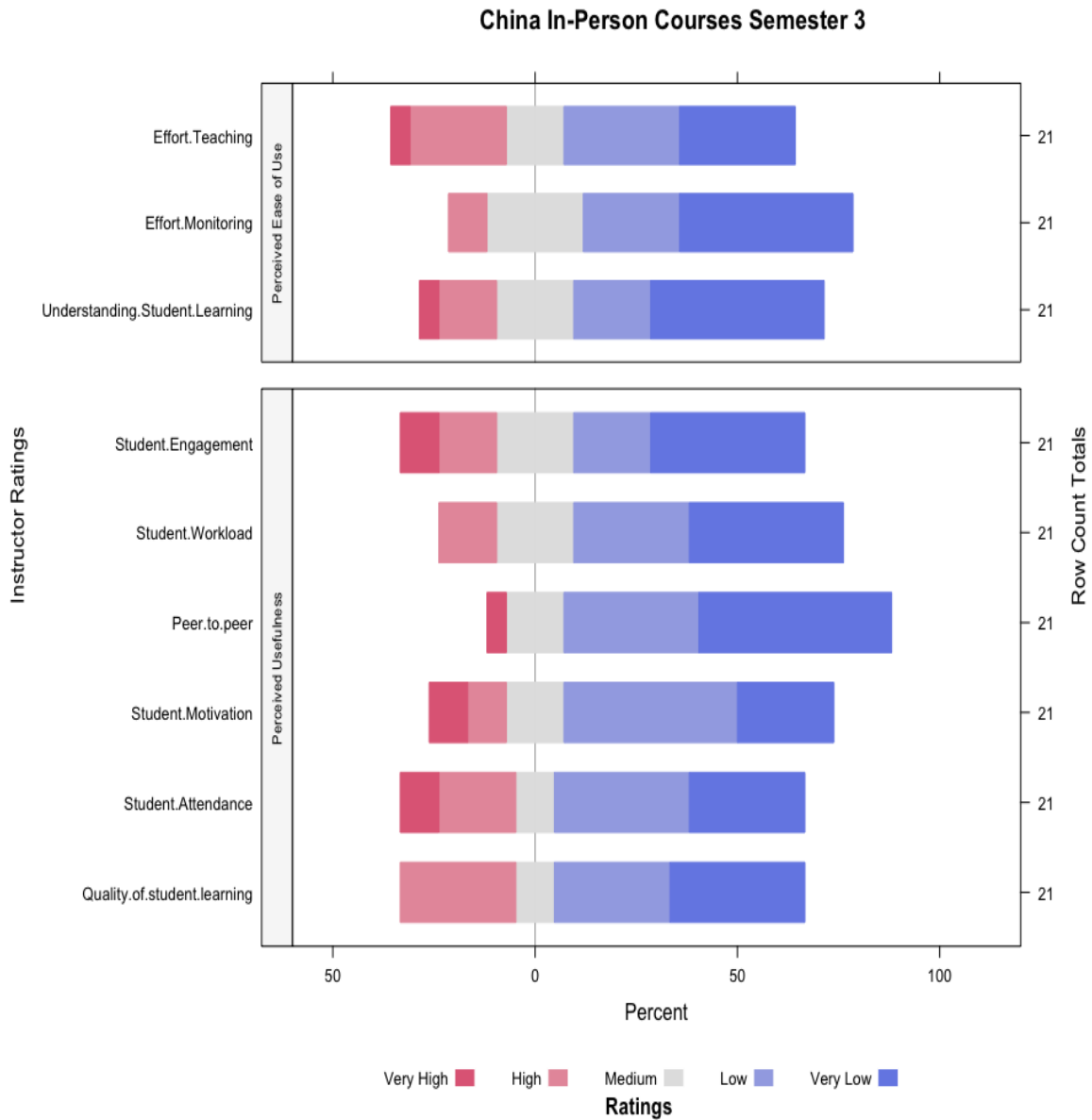


Figure 4.17. China Semester 3 In-person Course Measures



To test the significance of differences across semesters and modalities, we used the Wilcoxon rank-sum test with continuity correction. In courses reported in China, we found a significant effect of teaching modality on perceptions of teaching effort, with higher effort attributed to teaching in online formats ( $W = 23$ ,  $p < 0.05$ ) (Figure 19). Measures of student learning were significantly lower in online formats as compared to in hybrid modality of instruction ( $W = 22.5$ ,  $p < 0.5$ ) (Figure 20).

Figure 4.18. China: Effort Measures between Modalities

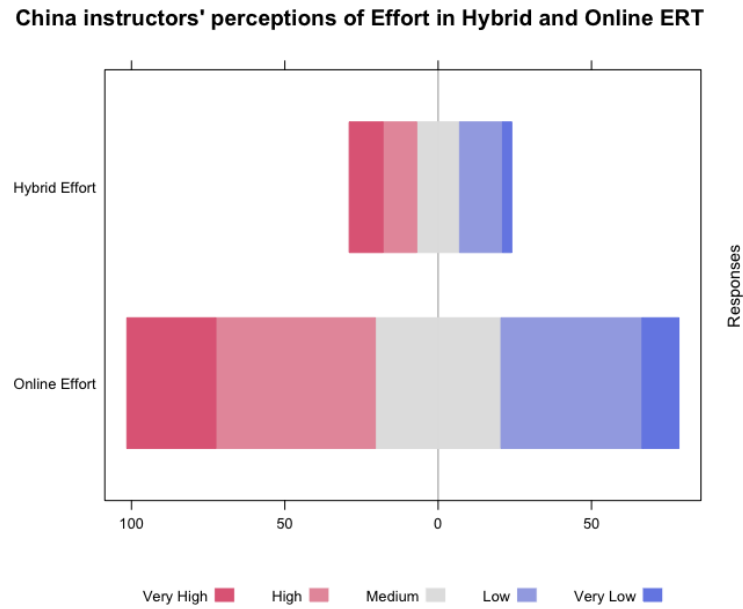
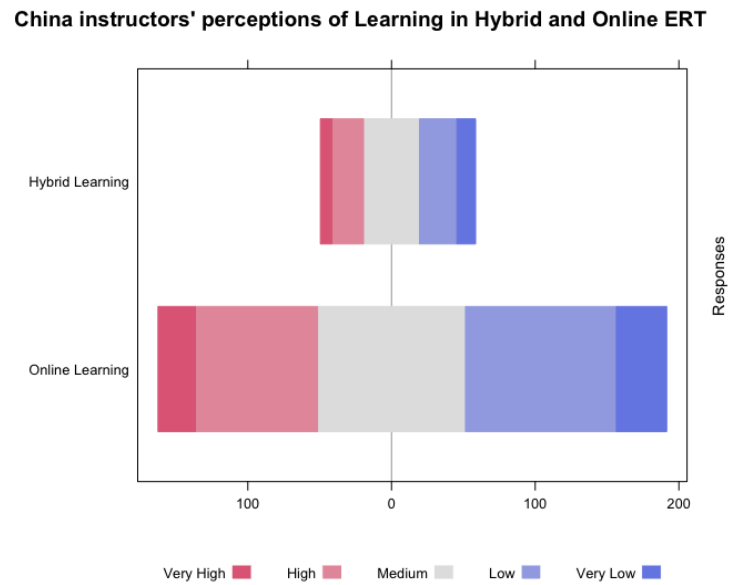


Figure 4.19. China: Learning Measures between Modalities



In between semesters one and two in the U.S. and China we found a strong effect ( $W = 9$ ,  $p < 0.05$ ) of the teaching period (wave) on measures of student learning, with lower perceived learning during the second semester.



## Individual Instructor's Change Perspectives

Next, we compared the differences across cultural contexts and gender identity about individual instructors' perceptions associated with the change (Compared to in-person instruction, how effective are the following aspects of online instruction?) and looked at the following aspects from the perspective of individual instructors:

- Live Instruction
- Recorded Lectures
- Course Assessments
- Student Questions and Discussion

The Figures 4.20 and 4.21 present the distribution of ratings (on a scale from Much Better to Much Worse) by instructors who identified as female and male across our sample. Because of the sample size (13 male-identifying and 9 female-identifying instructors in the U.S., and 14 male-identifying and 13 female-identifying in China), we broke the data down by gender and country but did not report the intersectional results.

A majority of male instructors also found *Live Instruction* worse online (73%), whereas a majority (66%) of the male instructors reported they found *Recorded Lectures* worse online. Although we can see some differences between male and female groups we found a non-significant effect of gender on rating of instructional aspects in online contexts ( $W = 10$ , n.s.). A majority of female instructors (57%) and male instructors (65%) reported they felt *Course Assessments* were the same in the context of online teaching.

Figure 4.20. Female Instructors' Change Perspectives

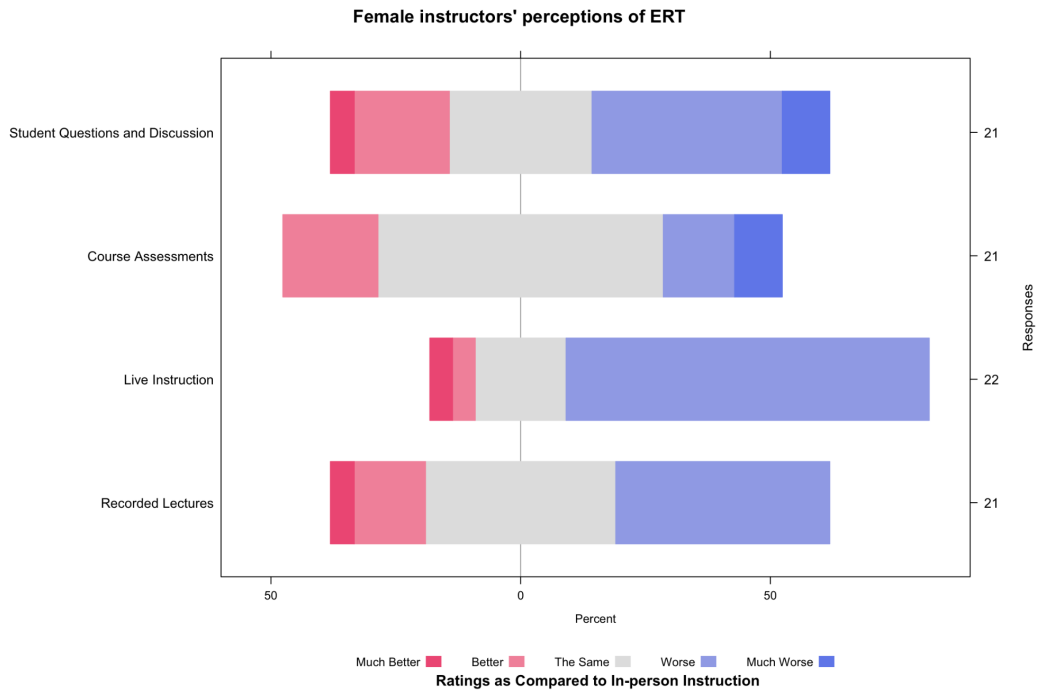
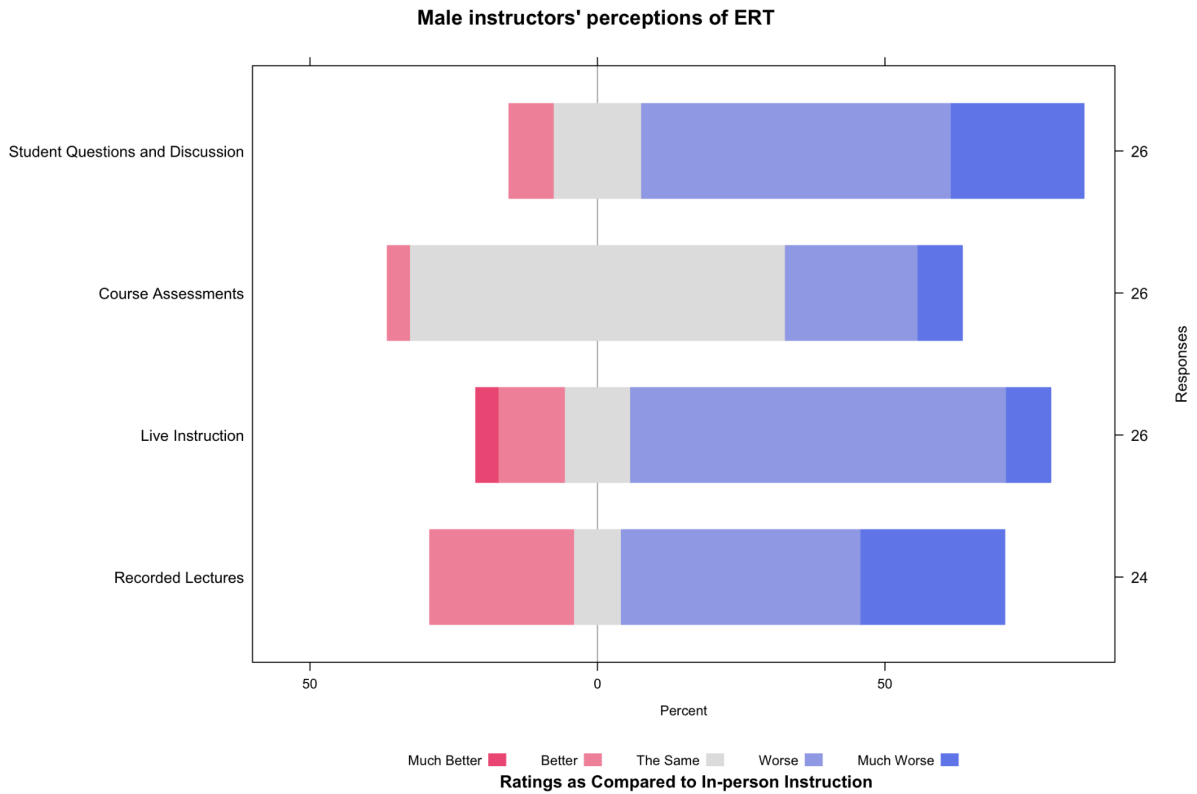


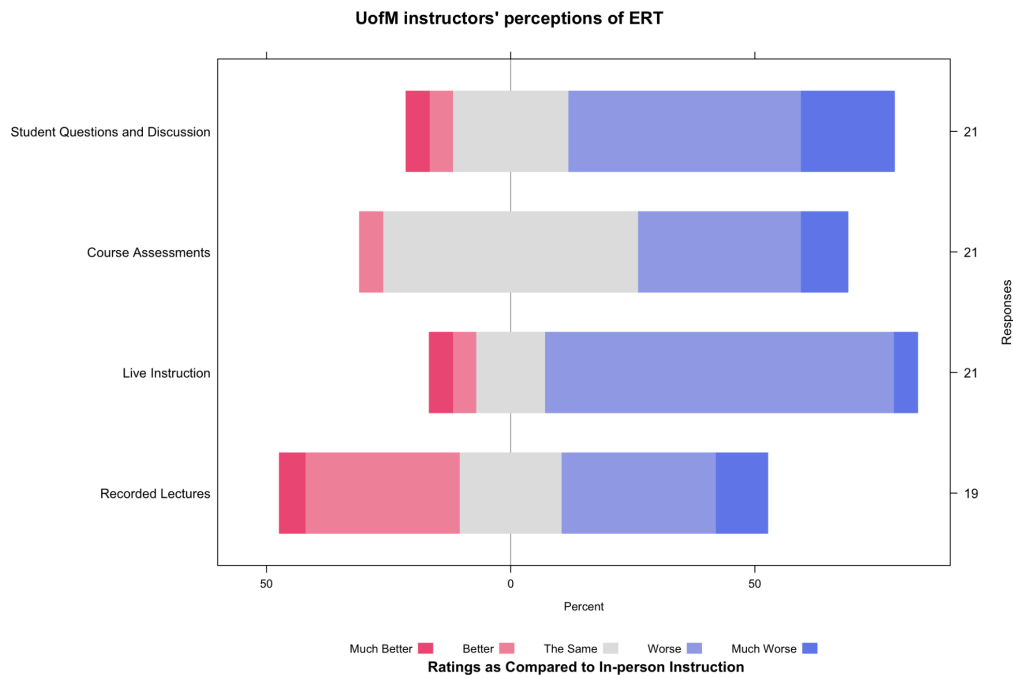
Figure 4.21. Male Instructors' Change Perspectives



Figures 4.22 and 4.23 present the same ratings on aspects of instruction as compared to in-person instruction, distributed within the two cultural contexts of this study - U.S. and China. The y-axis represents the category or aspect of instruction rated by instructors' (as compared to in-person instruction) and corresponding response rate, and x-axis is the distribution of ratings within the group. It is also important to note overall 96% of the instructors reported they taught courses during the pandemic-onset or peak-pandemic periods and many of the instructors (50%) taught in succession across the three semesters.

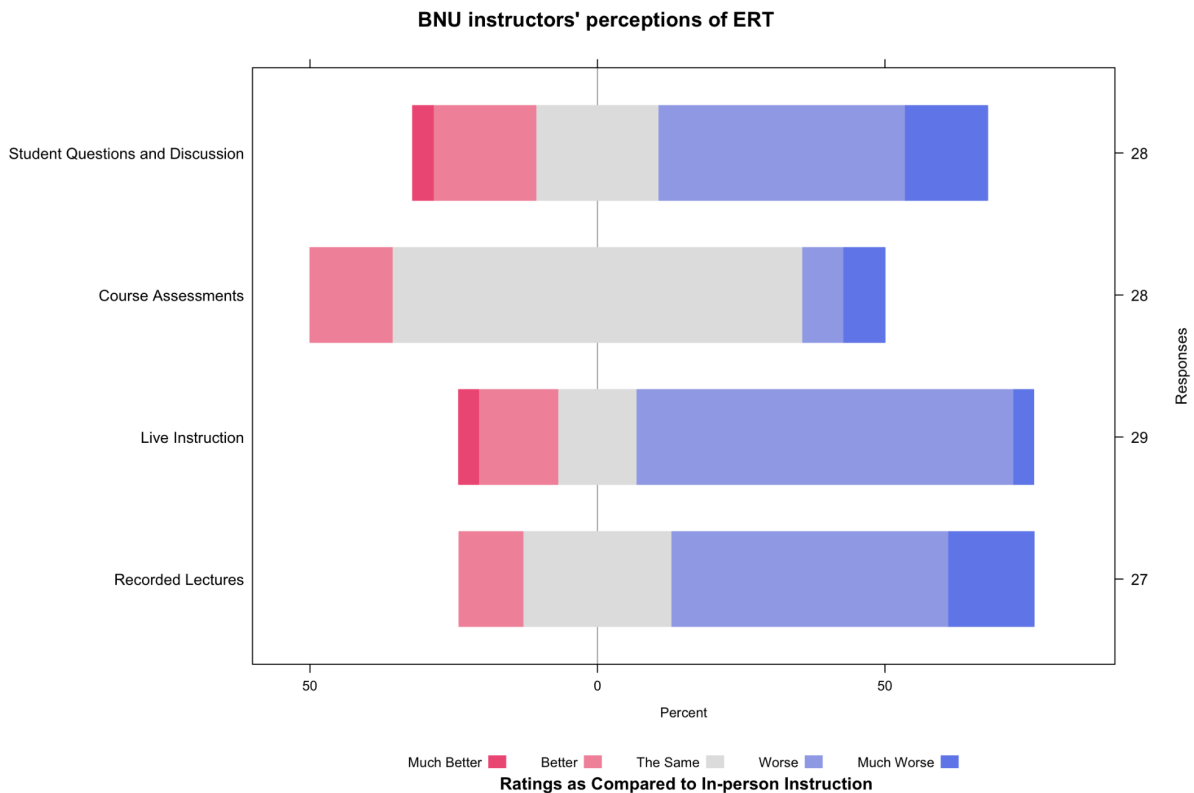
Overall a majority in both the U.S. (76%) and China (69%) reported feeling *Live Instruction* was worse online. In China more instructors (62%) found *Recorded Lectures* worse online as compared to in the U.S. (42%). A majority of instructors in China felt *Course Assessments* were the same in teaching online (71%); but a significant share of instructors in the U.S. (43%) reported feeling *Course Assessments* were worse in online contexts.

Figure 4.22. Change Perspectives in the U.S.



Overall, we saw more positive ratings in China towards ERT as compared to the U.S. with the exception of ratings on *Recorded Lectures*. The difference in ratings about instructional aspects of ERT between the U.S. and China was found to be significant ( $W = 16$ ,  $p < 0.05$ ).

Figure 4.23. Change Perspectives in China



There are multiple ways to interpret responses to change. Instructor ratings about instructional aspects during ERT can be seen as reflections of perceived usefulness, perceived ease of use. Additionally, we can associate the construct of *continued use* with instructors' outlook towards ERT and changes because of technology adoption in instruction. To do so, we analyzed instructors' responses to three open-ended questions designed to prompt respondents to reflect on their remote instruction experience and self-report their outlook on teaching online in the future; 1) If any positive changes came from your experiences with teaching courses online,

what are they?, 2) How will this experience change your teaching going forward? And 3) Is there anything else you'd like to tell us about your experience teaching online?.

We coded a total of 85 records from a set of 105 textual responses to the above questions, containing instructors' self-reports and reflections after a process of (a) data cleaning, (b) translation of Chinese to English and back-translation from English to Chinese, and (c) close reading of the English text. We eliminated responses such as 'no', 'none', and blanks from the response set. After thematic mapping of individual instructors' combined responses to the three questions we identified a total of four mutually exclusively *Instructional Response Style* themes including: (1) Exploratory, showing interest and willingness to try differentiated instructional approaches, (2) Compensatory, primarily concerned with addressing gaps because of changes in the modality of instruction, (3) Minimalistic, primarily concerned with doing (only) what is necessary for instruction to operate in different conditions, to (4) Averse, opposite of exploratory.

Table 4.9. Definitions for Response Style Categories

<b>Response Style</b>	<b>Definition</b>
<b>Exploratory</b>	Using words primarily showing interest or willingness in exploring options, technologies, approaches and experimenting with them in instruction.
<b>Compensatory</b>	Using words primarily exhibiting concern for gaps in instruction in different formats and approaches to compensate for gaps relative to in-person instruction.
<b>Minimalistic</b>	Using words primarily minimizing the extent of changes or prioritizing the necessary aspects of in-person instruction.
<b>Averse</b>	Using words primarily exhibiting aversion towards modified instructional formats or technology use for instruction.

Table 4.9 depicts the thematic codes and relevant definitions. Overall, the four Response Styles categories included: Exploratory (35%), Compensatory (27%), Minimalistic (24%) and Averse (14%). In the U.S. and China the *Exploratory* response style was chief among the coded response categories. The themes denote individual instructors' (a) response mechanism and (b) attitude towards change reflected in their outlook towards future instruction. The frameworks underpinning these categories are discussed in Chapter 5 in more depth, grounded in theories of demand characteristics, psychology of change and bounded rationality. Table 4.10 presents the ingroup comparison results of the categories of response styles identified from the samples in the U.S. and China. A third of the instructors' responses in both the U.S. (35.29%) and China (35%) exhibited the Exploratory style. In China another third (30%) were Compensatory while Minimalistic (20%) and Averse (15%) was lower in proportion. Relative to the U.S. (11.76%) more styles appeared as Averse in China (15%). In the U.S. almost a third (29.41%) styles appeared as Minimalistic while Compensatory were about a quarter of the response styles (23.53%).

Table 4.10. U.S. and China Instructional Change Response Styles

<b>Response style</b>	<b>China (%ingroup)</b>	<b>U.S. (%ingroup)</b>
Exploratory	35.00%	35.29%
Compensatory	30.00%	23.53%
Minimalistic	20.00%	29.41%
Averse	15.00%	11.76%

### *Life Aspects*

It is crucial to compare the instructional context at instructors' institutions with the time of their questionnaire responses. The questionnaire asked about instructors' perceptions about the degree of the pandemic's effect around aspects of their life (How much has the COVID-19 Pandemic affected the following areas of your life?); these included:

- scholarly work
- social relationships
- physical health
- plans for the year
- future plans

Figure 4.24. Instructors' perspectives in China and the U.S.

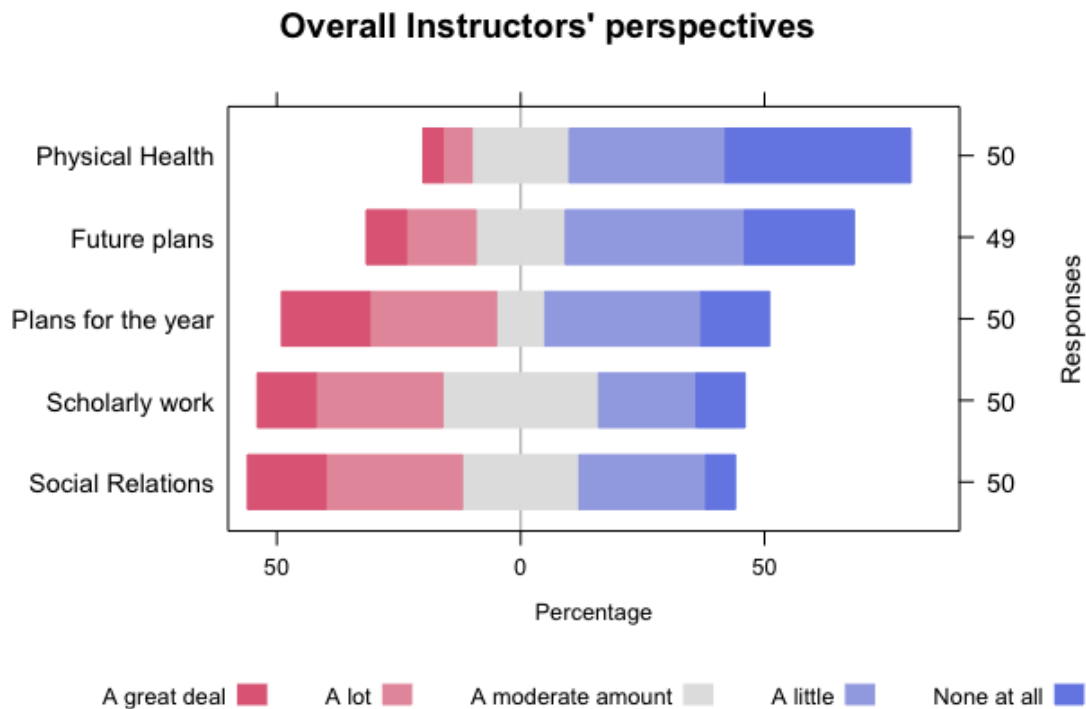


Figure 4.24 presents instructors' overall perspectives towards the degree the pandemic affected aspects of life and planning. Table 4.11 reflects instructors' perspectives in the U.S. and

China about the degree the pandemic affected different aspects of their life. Some of the instructors in the U.S. perceived the pandemic having a strong effect (from *a lot* to *a great deal*) on areas of scholarly work (40%), social relationships (63%) and physical health (18%), plans for the year (72%) and future plans (36%). The proportion of instructors in China (36%) who felt their scholarly work was affected a lot or a great deal by the pandemic was comparable to those in the U.S. (40%). A lower number of instructors in China reported a strong effect (from *a lot* to *a great deal*) of the pandemic on social relationships (29%), physical health(4%), plans for the year (21%) and future plans (11%), relative to the instructors in the U.S. Overall, in our sample we did not find any significant effect between life aspect ratings and perceptions of ERT in our sample ( $W = 54.5$  ,  $p > 0.05$ ).

Table 4.11. Instructors Ratings about areas of life affected by pandemic

Country	Degree	Scholarly work	Social relationships	Physical health	Plans for this year	Future plans
China	A lot	16.00%	12.00%	2.00%	8.00%	6.12%
	A great deal	4.00%	4.00%	0.00%	4.00%	0.00%
	A moderate amount	18.00%	12.00%	8.00%	4.00%	6.12%
	A little	10.00%	22.00%	16.00%	26.00%	24.49%
	None at all	8.00%	6.00%	30.00%	14.00%	20.41%
U.S.	A lot	10.00%	16.00%	4.00%	18.00%	8.16%
	A great deal	8.00%	12.00%	4.00%	14.00%	8.16%
	A moderate amount	14.00%	12.00%	12.00%	6.00%	12.24%
	A little	10.00%	4.00%	16.00%	6.00%	12.24%
	None at all	2.00%	0.00%	8.00%	0.00%	2.04%



## Overall Results

This chapter presented basic results from ratings and open-ended responses of our instructors. The next chapter will attempt to integrate and interpret the results of our thematic analysis of instructors' responses to open-ended questions and their ratings of different aspects of instruction, life and planning. The objective of our cross-cultural study was to capture the multifaceted nature of instructors' experiences, encompassing both the challenges they encountered and successes they achieved in navigating the uncharted territory of remote instruction. Instructors' testimonials and ratings from diverse academic and cultural contexts offer valuable insights into challenges, successes, and recommendations for future remote teaching practices. Table 4.12 summarizes some of the key findings.

Table 4.12. Key Findings on Instructional Experiences

Number	Key Finding
1.	Eight categories of instructional changes emerged from our sample of courses namely: Synchronous Discussions, Synchronous Lectures, Pre-Recorded Lectures, Informal Asynchronous Discussions, Synchronous Assessment, Asynchronous Assignments, Asynchronous Materials, Synchronous Group Discussions.
2.	Instructional changes can be categorized as promoting Narrative or Conversational types of interactions, with the former being focused on uni-directional delivery of instruction and the latter being more focused on multi-directional interaction.
3.	Instruction changed to promote narrative interactions in China, but conversational and narrative interactions were equally prevalent in the U.S.
4.	A substantial proportion of instructors in the U.S. and China reported decreasing levels of student learning in the second semester in both hybrid and online formats, but it increased in the U.S. by the third semester in online formats of instruction.
5.	A majority of instructors in the U.S. reported decreasing levels of effort in teaching in online and hybrid environments across semesters.
6.	A third of the instructors in both the U.S. and China responded to the ERT with an exploratory approach and only a minority reported as being averse.

By gathering their firsthand accounts, we stand to (1) gain a deeper understanding of the immediate impact of the pandemic on teaching, (2) identify predictors of long term instructional changes and (3) inform pedagogical strategies in technology mediated college education.

## **Chapter 5**

### **Coping and Adapting: Lessons from Teaching amid a Pandemic**

The landscape of higher education has been undergoing rapid changes in recent years, driven mainly by advancements in technology, economic shifts and societal demands, and also changing student expectations. According to a recent McKinsey report (Child et al., 2023) surveying 7000 college students from 17 countries, a significant share of university students are dissatisfied with the online learning offered by their institutions. At the same time, 65% of their participants want several aspects of their learning experience to remain virtual.

One of the key concepts that has gained prominence recently in discussions, globally, about the future of higher education is disruption (Bozkurt and Sharma, 2020; Gallagher and Palmer, 2020; Moore and Hill, 2020; Narwani and Miller, 2023; Quintana et al., 2021), with ideas imported from the business literature (Christensen, 1997). Here, disruption refers to the process whereby traditional educational models are challenged and potentially replaced by new and innovative approaches that leverage technology, pedagogy, and business models to provide more accessible, affordable, and relevant educational experiences for students. Many global reports unequivocally emphasized challenges of individual variation in connectivity and access to technological resources, as well as students' needs for empathetic and collaborative learning spaces.

What does the experience of responding to COVID-19 tell us about the nature of rapid instructional adaptation to shock and how can this inform responses to future unexpected events?

According to a report by UNESCO (2021), a major impact of COVID-19 on teaching and learning is the increase in online education and the hybrid mode of teaching has become the most popular form. If it means universities need to reevaluate and reimagine their online instructional offerings, this can't be done successfully without understanding the perspectives of those who will provide this instruction - college instructors. We designed our cross-cultural study to seek out the perspectives of instructors in the United States (U.S.) and China on their responses in coping with the disruptions brought about by the COVID-19 pandemic. We administered an online survey to college instructors in the U.S. and China to elicit their perceptions and reflections about teaching amid the period between the pandemic-onset and post-lockdowns. Our goal is to develop an understanding of how instructors responded to the disruptions that can contribute to (a) a general understanding of technology adoption and use, (b) an insight into instructional approaches in response to disruptions in teaching conditions, as well as (c) lessons learned that might be useful in future emergencies.

The terms “instructor”, “educator” and “faculty” are used interchangeably to refer to those members of higher education academia who conduct education. We use the terms “student” and “learner” synonymously. The terms “online/distance education” and “online/distance learning” are used to refer to the teaching and learning experiences when instructors and students are in separate physical locations. The terms “educational technology” and “instructional technology” are used interchangeably.

### **Cross-Cultural Analysis - Outlook Towards Instructional Change**

Universities have been exploring ways to leverage technology to enhance traditional classroom instruction since before the pandemic. Blended learning models that combine face-to-face instruction with online components have gained popularity, allowing for

personalized learning experiences and increased student engagement. Adaptive learning platforms that use data and analytics to personalize learning pathways for individual students have also gained attention.

### ***Tendencies Across Cultures***

Many American universities have embraced online learning as a means of expanding access to education, reaching wider audiences, and offering more flexible learning options. Massive Open Online Courses (MOOCs), for example, gained traction in the U.S., offering free or low-cost courses on a wide range of subjects. Universities such as the University of Michigan partnered with Coursera, a platform offering online courses from prestigious institutions around the world. Harvard created edX to launch HarvardX, their online university program. Additionally, some universities developed their own online degree programs, catering to non-traditional students who seek the convenience and flexibility of online learning.

China has witnessed a proliferation of online education platforms and a rapid growth in the number of online learners. The Chinese government has actively promoted online education as a means of increasing access to education and addressing challenges related to limited resources and an immense student population. Many universities in China have established partnerships with online education companies, offering online courses and degrees to students.

Universities have responded to past disruptions in higher education in diverse ways, ranging from embracing technological innovations and online learning, to redefining their value proposition and reimagining the role of faculty in the learning process. However, the unprecedented global lockdowns because of the COVID-19 pandemic did not give people, let alone universities, the leisure to plan, rethink, reimagine and redesign instruction in a considered way.

Hodges et. al (2020) labeled the alternative delivery of education under crisis as Emergency Remote Instruction (ERT). Although, in both contexts - U.S. and China, online learning was not new, the responses to the demands of ERT varied greatly. The abrupt changes experienced by higher education to cope with demands of the pandemic-induced ERT was akin to a large-scale global experiment.

### **The Remote Instruction Experiment**

Our study bore witness to ERT as it unfolded, albeit in slow-motion. ERT put premiums on the malleability of course instruction and resilience of learning. Situating ERT as a global quasi-experiment, we observed the movement of course instruction online as a behavioral intervention enabling us to see both immediate and longer term effects on instruction.

### ***Contextualized Conditions of Teaching and Living***

Narratives used words including ‘abrupt’, ‘sudden’, ‘swift’, ‘rapid’, ‘unprecedented’, ‘unpredictable’ to characterize the shift to ERT in education. We recognize pandemic-induced remote instruction as a *shock*, not only because of the immediate need to shift to online teaching and learning, but also because of the pandemic’s effects associated with lockdowns and risks to health, on all aspects of life.

In our sample, both in the U.S. and China, a majority of instructors were less concerned over their physical health. We interpret these findings in the context of the universities we surveyed. Both institutions represented in our sample are top-ranked in the world and it can be assumed instructors felt less insecure in terms of healthcare mainly because of the support systems in place at their universities.

Interestingly, our findings reveal a large effect on the quality of social relationships and plans for instructors’ in the U.S, whereas half of the instructors in China felt the pandemic had

only a little effect on their social relationships and plans for the year. Several studies in the U.S., including by Antonucci and colleagues (2011) from the University of Michigan (UofM) stress the connection between social ties and general well-being. These differences may reflect different beliefs and expectations about social relationships for instructors in the U.S. and in China, and open up questions around their concepts of well-being. Three things are important to consider. The first is the level of awareness in society in general around the connection between social relations and well-being. The second is the degree of self-awareness and ability to recognize and name emotions and their effect on physical health. The third is the nested effects of individualist or collectivist mindsets.

Instructors in the U.S. had some leeway over the formats of their courses, while in China state lockdowns and institutional policies were main factors in determining the format of courses. Our findings clearly indicate a majority of courses were taught online in the U.S. What is more interesting is the trends were the opposite between the U.S. and China. In our sample none of the courses in the U.S. were taught in-person in any semester, while in China a third of courses reported on were taught in-person across the three semesters from the pandemic-onset and into the post-lockdowns. The number of courses taught online decreased in China by over half (from 44 in the first semester to 19 in the third semester). In the U.S. online instruction doubled by the third semester (from 7 in the first semester to 15 in the third semester).

While some instructors felt negatively about the effect of the pandemic on scholarly work, we did not find any overall extreme negative effects on aspects of life in our sample. The relative lack of effects on health and scholarly work makes it easier to focus on one area where significant changes were reported - the instructional experiences of remote instruction and decision-making around college level instructional changes and choices.

### ***Changed Instruction in Differentiated Conditions***

Eight categories of instructional changes emerged from our sample of courses taught in the U.S. and China between the pandemic-onset and post-lockdowns, namely: Synchronous Discussions, Synchronous Lectures, Pre-Recorded Lectures, Informal Asynchronous Discussions, Synchronous Assessment, Asynchronous Assignments, Asynchronous Materials, Synchronous Group Discussions.

The eight instructional changes were grouped by two types of interactions (by extension of the Laurillard, 2002 Conversational Framework): Narrative interactions and Conversational interactions. The two types of interactions are different in terms of their directionality. Narrative interactions are characterized by instructional materials and communication meant to deliver information to students mostly didactically. Conversational interactions on the other hand feature opportunities for in-the-moment feedback or real-time bi-directional communication between instructors and learners.

Figure 5.1. Characterizing Course Instructional Changes: Cognitive Aspects of Course Instruction

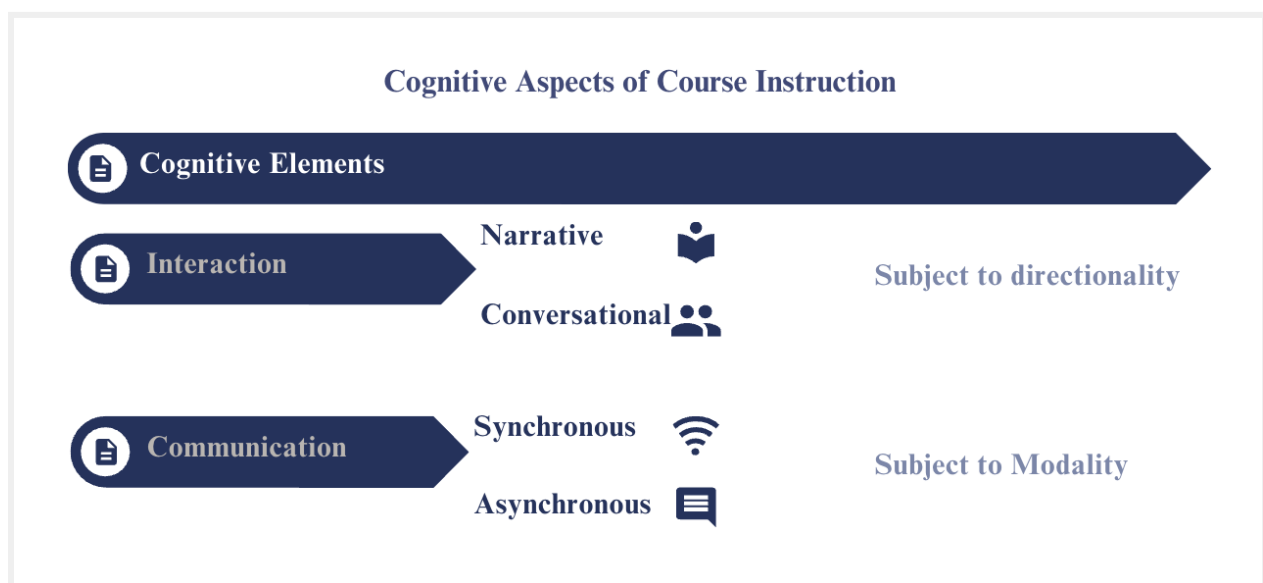




Figure 5.1 depicts the underpinnings of our Interaction Modality Communication (IMC) model used to support the identification of instructional change features in our analysis of course instruction during ERT.

### ***Cultural Differences - Learning Centric and Teaching Centric***

The intergroup comparison of instructional changes between the U.S. and China revealed a more dominant presence of *narrative interactions* relative to *conversational interactions* overall among the 146 instructional changes reported across 199 courses taught by 51 instructors in three semesters. This reflected a difference between the U.S. and China. There was higher prominence for instructional changes featuring narrative interactions in instruction in China, whereas in the U.S. conversational and narrative interactions showed up as quite balanced across the courses, with Synchronous Discussions ranking on top.

We hold two interpretations for the prominence of narrative interactions in instruction in China. The first is that narrative interaction choices in instruction are a reflection of the cultural context. In Chinese culture significant value is ascribed to didactic instruction, rooted in the concept of the teacher as the source of knowledge and the student as the recipient of it. As Chomsky (2000) stressed, social constructs are manifest in language use. The simplified Chinese word for teacher/Lǎoshī 老师 has two components - the first 老/Lǎo can mean old, aged, tough; the second is used as a noun for expert, master, example, model. The word for student is 学生 /Xuéshēng and also has two components - 生/Xué is used as a verb for study, learn, imitate; the second 生/Shēng is to describe being born, raw, unripe, uncooked. The traditional version of the character xué - 學 - depicts hands bringing knowledge into the head of a child. This derivation is more explicit in the ancient small seal form of this character, shown in Figure 5.2. The

instructional approach can be aptly mapped to the Freire banking model of education, in terms of the association of the teacher as the giver and student as consumer of information to be learned.

Figure 5.2. Ancient Chinese Character Representing Learning

## Ancient small seal form



(Dong, n.d.)

The second interpretation is related to responses to a crisis. In the face of disruptions or crises - unmanaged and uncertain changes, people can have diverse responses. According to a report by the U.S. Centers for Disease Control and Prevention (CDC) psychologically people may revert to more basic or instinctive fight-or-flight reasoning in a crisis (Credible, 2019). It is important to remember people facing disruptions process information and can respond very differently from when they are in normal circumstances. One of the response mechanisms to a crisis can be to 'lock all doors' or in other words to minimize possibilities of increasing chaos by maximizing control. We can map it to a classroom context, wherein the instructor can increase their control of the situation by reducing the amount of bi-directional communication requiring management. We interpret it as a reflection of an autocratic approach to managing situations - where the instructor assumes the singular responsibility to command and direct the discourse of a class by more uni-directional instruction.

In sharp contrast, in the U.S. the balanced distribution of narrative and conversational interactions can be seen as a reflection of the underlying need to balance power by establishing a democratic setting where each participant feels involved. Although instructors are primarily responsible for the outcomes of a course, they are not necessarily the ones assuming the power

over the group. The value ascribed to ‘choice’ and ‘agency’ clearly reflect some of the core elements of the American culture and political system. According to Herrenkohl et al. (2018) agency does not reside in individuals, but exists only as a dynamic interaction and involves strategies inextricably linked to culture and context from a critical socio-constructivist perspective. These are examples of normative constructs stemming from cultural context and underpin many of the instructional choices we observed in our sample from the U.S.

Pedagogically, making conversational choices are healthy approaches to (1) offset some of the loss in quality of interactions because of the absence of in-classroom interactions and (2) enable students to develop a sense of agency and responsibility as individual participants. Narwani et al. (2021) reported finding improved learning community development and graduate students’ intellectual outcomes by the implementation of educator strategies, such as translation of lesson activities to online formats such as (a) reading reflections, (b) collective reading analysis in groups and (c) whole group synthesis. Moreover, the underlying benefit of conversational interactions is enabling individualized instruction, adjusted as far as possible towards the needs of learners.

In a descriptive sense, the instructional changes made by faculty in the U.S. were clearly motivated by priorities around support for student engagement, motivation and collaboration. These concerns are closely related to those reflected in the reports across some U.S. Universities (Cutri, Mena and Whiting, 2020; Gal and Israel-Fishelson, 2020; Narwani, Herrenkohl, Brass, 2020) around making learner centered course design fit in online learning environments.

The antecedent models for instructional design have significant import as is seen in the instructional changes reported by instructors in our sample. By mapping the Conversational framework (Laurillard, 2002) to the changes we observed, in terms of communication and

interaction, we attributed characteristics to instructional changes made for ERT. Evidence we found reinforces the importance given to instructional design features meeting criteria stressed by Laurillard (1999), such as (a) operating as an iterative dialogue and (b) being discursive, adaptive, interactive and reflective; and (c) operating at the level of topics and (d) level of actions within related tasks.

Prior research has established the constructivist benefits of enabling discussions in classrooms - between teachers and learners and among the learners, in both synchronous and in asynchronous settings. Littleton and Whitelock (2005) mapped the Mercer framework - developed to understand face-to-face educational dialogues, to the context of asynchronous electronic conferencing. Their study confirmed students engaged in discussions online were building knowledge by accumulation and accretion, and while there was evidence of them engaging in an exploratory mode of interaction it was not predominant. Wang (2018) in a study of a college course taught online to students in China found the role of teaching assistants and the timely application of teaching strategies to support students' needs as key factors in students constructing high-level knowledge. Wang's study is particularly interesting because it suggests that finding ways to support student autonomy may be effective even in settings that do not stress this as a feature of instruction.

### ***Demands on Instruction in Differentiated Conditions***

There are significant demands on instructors engaged in synchronous and asynchronous instruction, involving managing communication, managing outcomes and managing expectations in order to maintain continuity of education. In synchronous conversational instruction, such as online Zoom classes, demands are higher, for example in facilitating videoconferencing,

monitoring student engagement and managing communication (Lowenthal et al., 2020; Lowenthal et al., 2021).

A majority of the instructors who taught during the pandemic-onset, peak-pandemic and post-lockdowns in succession in the U.S. reported decreasing levels of effort in teaching in online and hybrid environments across semesters. In the third semester in general across both countries, the U.S. and China, about half of the faculty reported a moderate measure for effort teaching in Online and Hybrid Course Modalities.

Some of what we observed might be explained by Lewin's three step psychological model of change - a simple and practical model for understanding the change process - in three phases called *unfreezing*, *changing* and *refreezing*. The substantial number of faculty who reported a somewhat high effort can be explained if the majority of the U.S. faculty in our sample taught online for the first time in the first or second semester. By the third semester, when people were more acclimated to new-normal working conditions, it might have been less stressful to teach online or monitor student learning, compared to the first semester. Teaching multiple semesters could have alleviated some of the issues faced by faculty in the first semester of online ERT. However, a substantial number of faculty teaching online in the third semester were doing so for the first time, and so had to deal with many of the issues the faculty who taught in the first semester had to face, in terms of re-thinking about their course design to fit online modality.

### ***Higher Demands on Learners Post-Adjustment***

The general trend was that reported effort associated with teaching decreased from the first to the third semester in the U.S., and we saw a consistent increment in measures of engagement and other aspects of learning, reflecting higher *perceived usefulness* (Davis, 1989)

of changes in instructional approaches. However there was a deviation in China where instructors rated lower levels of effort but also lower student engagement in teaching face-to-face classes on campus. The deviation can be interpreted in two ways. The first is that because of the interruptions and unpredictability of state lockdowns in China, students and instructors might have led to a lower sense of continuity and hence to lower motivation. The second is that it might be possible as instructors grew more accustomed to monitoring student engagement in the prior two semesters, they were paying more attention and hence held higher standards for in-person student engagement.

Among the instructional changes observed, increased use of Asynchronous Materials, Asynchronous Assignments, Pre-Recorded Lectures and Synchronous Discussions appeared across multiple semesters of instruction. How can we explain instructional changes persisting after the peak-pandemic periods, even if those called for higher effort in teaching and monitoring learning outcomes?

### ***Lasting Change in Instruction - Incremental Improvement Was Common***

In theory the Hawthorne effect might help construe sources of lasting instructional design changes. Complementarily the attribution theory might suggest instructional changes arise from a process of self-reflection faculty underwent, as a result of inadvertent constraints arising from changes made to their working conditions. Multiple interpretations might hold when looking into our experimental phenomenon of ERT. One is that people change their ways of doing something as a result of psychological factors when placing their work in unfamiliar settings. A second is that people inherently draw improvement strategies out of self-reflective work, indirectly brought upon by interventions not designed with the intention for self-reflection. The third is that people alter their behaviors when attention is paid towards them or as a result of other social factors.

According to Adair (1984) the occasion and direction of the Hawthorne effect might operate in, can be based on the subjects' perception of the experiment and their role in it. The context of the experiment gives adult subjects (instructors) the necessity to develop a purpose or meaning for the situation they use to guide their behavior (Adair, 1984, p 339).

Some of the testimonials from instructors demonstrated self-reflection and re-orientation in changed conditions.

Testimonial 1 - China course instruction

“I will be glad when it's done” China sample instructor

Testimonial 2 - China course instruction

“The additional needed scaffolding for student work will be useful in the future. I plan to continue to record small orientation lectures for discussion classes, and then class meetings can be more focused (and perhaps shorter)”

Testimonial 3 - U.S. course instruction

“Midstream switch, no planning time. Teaching the same course 2021 Winter, much smoother, fully remote.”

Testimonial 4 - U.S. course instruction

“I'm not sure I'd change anything - things feel so much easier now that we've had more experience with online teaching”

The following testimonials illustrate some lessons learned from the pandemic-induced remote instruction:

Testimonial 1 - U.S. course instruction

“I probably will do away with exams. I will use more digital tools for in-class activities, assignment submission and marking, etc.”

Testimonial 2 - U.S. course instruction

“We all (the students and myself) recognize the difficulty of the pandemic situation. This yielded a sense of comradery (sic) among us all.”

Testimonial 3 - China course instruction

“I plan to use more video than in the past and have students watch online before class”

Testimonial 4 - U.S. course instruction

“Coming up with meaningful weekly discussions designed to keep students engaged with the material, build community, as well as deepen their knowledge. I spent many, many hours doing so. (I've come to love many of these assignments, especially the 100% participation, although it's not nearly as gratifying for me.) I also found it a challenge to plan for synchronous discussions, since the discussion portion of my class has always been interwoven with my lectures.”

The sample of testimonials depict the reflective component of instructors' perspectives towards the changes they were making to their instruction. In other words, when considering the instructor as a participant in the larger quasi-experiment of ERT, their change in instruction can be attributed to their perception of improvement, a secondary dimension of the Hawthorne theory. The Hawthorne theory effect in ERT is affected by conditions of stress and uncertainty, associated with the pandemic outbreak, global travel restrictions and nation wide lockdowns. Analyzing the ERT observations as a behavioral intervention allowed us close-up on the responses of instructors to a certain degree. According to Kurt Lewin's behavior equation an individual's behavior (B) is a function (f) of the person (P) and their environment (E). Placing it in the context of ERT and demand characteristics we can explain some of our observations.

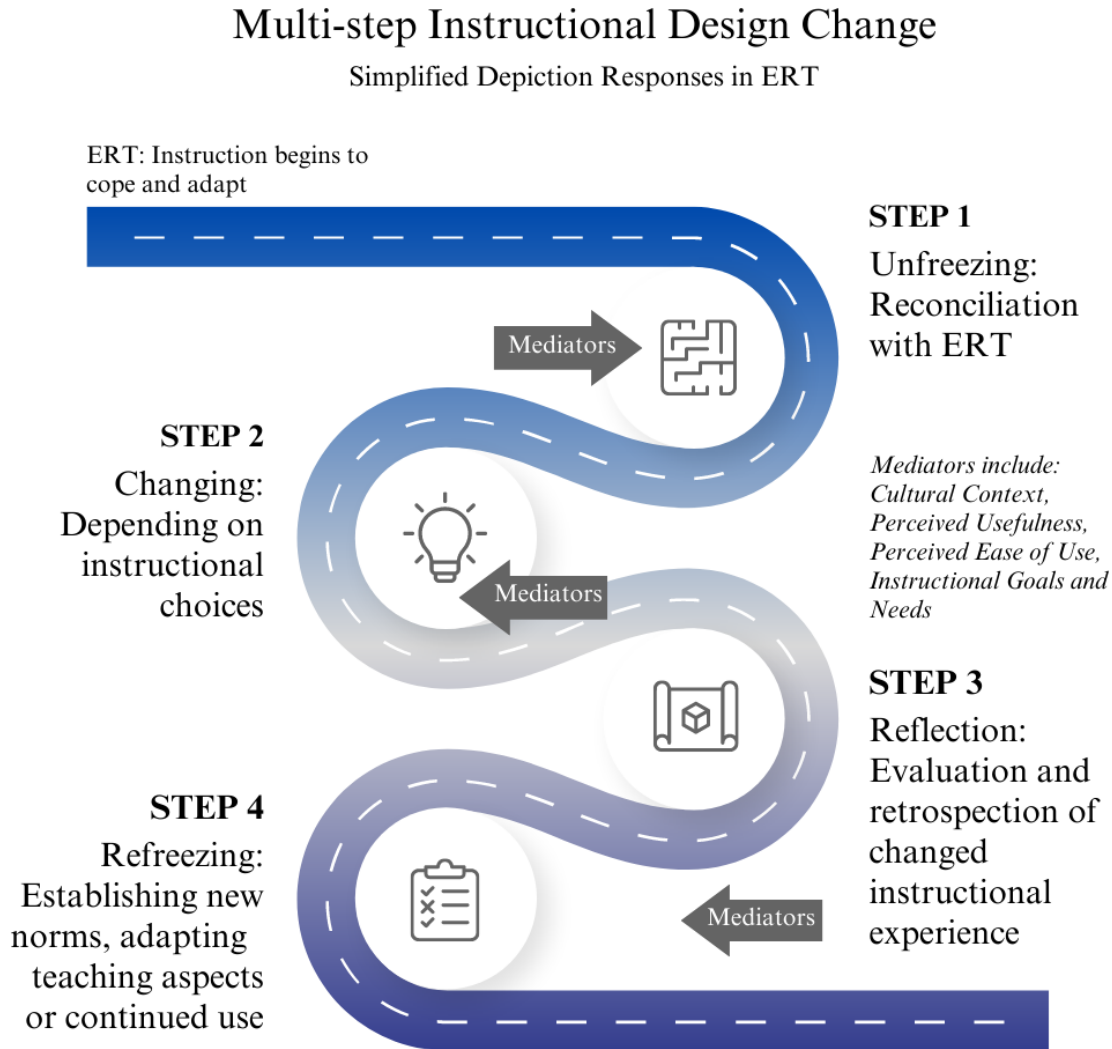


During the pandemic-onset period instructors experienced a remote instruction shock and it resulted in the step of ‘unfreezing’, in terms of Lewin’s change theory - breaking the status quo. The second phase in Lewin’s three step model is ‘changing’ and the third is ‘refreezing’ involving setting up new norms. If every instructor in our sample experienced ERT in the pandemic-onset period, we could demarcate the three steps clearly across between the pandemic-onset and peak-pandemic periods as refreezing, and from between the peak-pandemic to the of post-lockdowns period. However, because instructors in our sample experienced teaching in differentiated modalities at different points, some in the pandemic-onset and others during the peak-pandemic, unfreezing of instruction took place at different times. Moreover, contrary to the U.S. where in the post-lockdowns we saw only online courses reported in our sample, in China, instruction varied between online, hybrid and in-person and sometimes instructors juggled moving between different modalities within the same semester. It means instructors experienced unfreezing, changing and refreezing instruction at different times across different courses. Figure 5.3 attempts to depict the complex instructional design change and incorporate the multiple steps and mediating factors involved in the experiences of coping and adapting to demands of ERT.

Instructors were faced with several challenges in the unfreezing step because of the demands of ERT as well as the need to cope with dynamic, uncertain and unpredictable conditions. Bounded rationality theory would assume most instructors made decisions in an attempt to satisfice, and not optimize or augment. Because the circumstances for ERT made optimal solutions hard to find, bounded rationality acknowledges instructors strived to make rational decisions within constraints of time, incomplete information, limited resources and cognitive limits. Response

styles can be explained using the theory of bounded rationality as those to satisfy *goals or needs* pertaining to coping and adapting in the face of ERT.

Figure 5.3. Simplified Depiction of Instructional Responses in ERT



Depiction combines ideas from Lewin's 3 step model for change and Davis (1989) Technology Acceptance Framework

Our observations of instructors' outlook towards teaching in the future and their response to our questions about whether there were any positive effects of ERT led us to find a mix of different response styles (Appendix 4) including: (1) Exploratory, showing interest and

willingness to try differentiated instructional approaches, (2) Compensatory, primarily concerned with addressing gaps because of changes in modality of instruction, (3) Minimalistic, primarily concerned with doing (only) what is necessary for instruction to operate in different conditions, to (4) Averse, the opposite of exploratory.

Each of the response styles seemed to be driven towards disparate goals. The Exploratory response style was distinguished by using words primarily showing interest or willingness to explore options, technologies, approaches and experiment with them in instruction. A third of instructors' reflections in both the U.S. and China exhibited Exploratory response styles. Our finding is a positive indicator about the outlook towards change or refreezing of instruction using technology and nuanced instructional approaches tried and tested during the ERT. Compensatory and Minimalistic response styles were oriented towards addressing gaps or needs. Styles were seen as Compensatory by the use of words primarily indicating a concern for gaps in instruction in the new instructional format or approaches to compensate for gaps relative to in-person instruction. Minimalistic styles were identified by the use of words primarily minimizing the extent of changes or prioritizing any necessary aspects of in-person instruction. In China a third of the styles appeared as Compensatory whereas in the U.S. a third were Minimalistic. The Averse response styles can be seen as the opposite of Exploratory because of the use of words primarily exhibiting the aversion towards modified instructional formats or technology use for instruction altogether. In both the U.S. and China Averse styles were the lowest, however there were more in China as compared to the U.S.

It is clear that instructional choices are not binary - take it or leave it – situations, and what we learned from instructors' perspectives reinforces the complexity of making instructional changes. It also reminds us we cannot simply categorize instructional choices and changes to

instruction as good or bad. The ways instructors adapted their instructional approaches depended on several factors. In our attempt to draw on lessons from ERT we identified some of the predictors of instructional change, including (a) effect on student engagement, (b) value ascribed to the role of student agency, (c) effect on quality of learning, (d) coping mechanisms or response styles and (d) agency of course instructional design.

### **Significance**

The process of moving courses from face-to-face to online formats relies heavily on the instructor and (where available) an instructional design team. Reflections from faculty members inform much of the discussions around what constitutes the work involved in migrating from conventional teaching to online courses.

We corroborated meaningful and salient themes from data collected as ratings and reflections from faculty teaching in the U.S. and China. Combining elements of both quantitative and qualitative research approaches helped us overcome the limitations of a small sample size in empirically drawing conclusions. We needed a theoretically grounded framework in order to explicate categories for our emerging themes and identify lasting effects in terms of instructional changes from faculty perspectives. Because of the lack of an existing model to conceptualize our observations, our study lays out the framework for cross-modality instructional changes.

In our study we present the Interaction Modality Communication (IMC) as a conceptual model by extending Laurillard (2002) Conversational framework and Hrastinski's (2008) modes of communication into new modalities. The IMC enables observing the features of instructional changes along dimensions of interaction, modality and communication from open-ended textual responses of changes and challenges instructors reported. By means of abstraction the characteristics used to conceptualize features of instructional design change in the model allow

us to see these from constructivist and cognitivist perspectives. Our model is flexible and can accommodate additional dimensions to represent other aspects of instructions, for example using characterizations such as supervised and unsupervised learning (Shafto and Seifert, 2015) in future or extended studies. More importantly, the conceptual model is technology agnostic and thereby can be recruited to study features of instructional change in any instructional modality and learning environment.

As a tool to support course design or redesign the IMC enables designers and instructors to identify instructional changes. It can also be recruited to enable visibility, reflection, assessment and improvement of features of a course design. The conceptual model helps us across multiple units of analysis, including a lesson activity, lesson or session, course or program, thereby offering educators and instructional designers the ability to zoom in or zoom out as needed. Overall, the IMC can address the gap of a much-needed flexible technology-agnostic feature mapping tool to represent the cognitivist-constructivist aspects of instructional design.

We conducted our study across different contexts and conditions as an attempt to make explicit some of the tacit knowledge represented in instructors' choices and strategies. In doing so we unpacked some of the factors to predict instructional design changes and instructional responses to change. Crises do not only prompt negative emotions and behaviors. Positive responses might include coping, altruism, relief, and elation at surviving the disaster. Feelings of excitement, greater self-worth, strength, and growth may come from the experience (Credible, 2019). Our findings demonstrated instructional creativity stemming from the need to adapt to conditions instructors found themselves thrust into.

Prior to the pandemic, decades of reports in higher education cited resistance towards using online education as a mainstream format for college instruction. We looked at snapshots of the ERT during the pandemic-onset, peak-pandemic and post-lockdowns periods. Like a photograph, although we could not capture and observe all the moving parts a video in its place might allow, our snapshot encompassed three semesters of teaching in differentiated conditions and allowed us to draw key insights from instructors' perspectives.

Our findings exhibit the emergence of differentiated instructional strategies in the ways instruction was expressed - permutations and combinations of narrative and conversational communication integrated into instruction, in asynchronous and synchronous formats. In the U.S. the general ratings of faculty trend positively from pandemic-onset to post-lockdowns towards online formats of instruction. The trends in the U.S. were more positive as compared to China. Instruction in the U.S. categorically prioritized students' needs and engagement even under suboptimal teaching conditions; whereas in China instruction took on a more controlling approach to cope with the demands of ERT.

We attributed distinctive persisting changes in instruction to the Hawthorne theory effect, whereby once instructors shifted their instruction online and tested uncharted pedagogical strategies, it brought about lasting changes to their instructional approaches. Some of the instructional changes demanded higher effort in differentiated modalities and we would have suspected these would have been the first to be discarded after the need for ERT receded. However, many instructors kept some of the changes made during ERT even if those demanded higher effort in teaching or monitoring student quality of learning. We observed how the Hawthorne theory effect showed up, in terms of an ability to test new methods and reflect on the ERT experiment, and unintentionally the opt-out choice, meaning to revert to pre-pandemic

instructional design, indirectly supported *continued use* - as Davis (1989) might call it, of instructional changes made during ERT.

We identified four types of instructional response styles stemming from ERT experiences - Exploratory, Compensatory, Minimalistic and Averse. These findings were otherwise imperceptible without access to longitudinal studies of integrations of technology mediated instruction in mainstream college education.

Our cross-cultural study brings to the foreground voices of instructors who experienced teaching under unique and dynamic circumstances. Although we could not witness the process of individual courses moving online, by means of our questionnaire we shed light on the less visible aspects of instruction. We knew ERT was not the same as online teaching under usual conditions. Our data told the story of instructors coping with, responding to and managing the disruptions to their college teaching. Some lessons we learned from instructors' ERT experiences tells us the most useful changes to instruction were those centered around (1) making learning experiences, (2) recognizing the gaps to address because of the limitations of technology, and (2) engaging students in ways to enable their agency.

The testimonials from some of the instructors in our sample reflect their outlook towards the future of education, as being one where making peace with technology in your classrooms can be an opportunity for creativity and reevaluation of instructional choices. Our findings are helpful to inform educators, particularly teacher educators, instructional designers, learning experience designers and educational technologists who are chief among those invested in improvement of higher education learning experiences.

### *Assumptions, Limitations and Future Directions*

We recognize three important limitations because we studied the ERT experiment retrospectively. First, we are limited in terms of what we can observe using a questionnaire eliciting ratings and reflections. For example, we did not have access to the decision making processes as they occurred in responding to disruptions. However, we can observe the subtleties across changes made in course instruction and learn about the dynamic decisions to delineate factors influencing some of the lasting effects on instruction.

Second, we did not directly prompt instructors to tell us about the experience, for example in management of the crises. Retrospective reflections can be susceptible to a cognitive bias called ‘rosy retrospection’ or ‘positive hindsight effect’ because of biased recollection of past difficulties or struggles as being less challenging or significant as compared to how they were perceived initially. As a result the responses in our sample may be on the positive outcomes and the opportunities emerging from overcoming the pandemic-induced teaching shock.

The third is attributed to underlying assumptions about (a) university policies during lockdowns and (b) diverging norms in individualist and collectivist societies. For example, we did not directly prompt respondents in China to share whether it was a mandate to return to campus during the post-lockdowns period, once the absolute global travel restrictions of the pandemic-onset period had been lifted. We did not ask instructors questions about whether they could opt-in or opt-out, how they felt about what others were doing or what kinds of information sources they relied on for making decisions about instructional changes. Asking such questions could have helped us gather information useful for debiasing studies or unintentional choice architecture studies. Examining dynamic conditions at institutions, and in some ways inherently at state levels would require approaching instructors with caution towards different cultural and



political climates. For instance, we would need to better understand the sensitive nature of sharing their ‘opinions’ and ‘experiences’ in China, because these could lead to findings with controversial interpretations. It was not a part of the scope of our study to form a detailed analysis about the teaching conditions surrounding ERT, resulting from a mix of social, political, and economic nested effects. Not because it was not important, but mainly because it would warrant a different methodology with a different focus.

In our study we focused on the layer of instruction, its aspects, choices and changes from the perspective of instructors. Our findings are limited by the range of our data. We designed our questionnaire to learn from instructors about their experiences and develop an understanding about their responses to the ERT demands. In doing so we prompted instructors to self-report, rate and reflect on several aspects of instruction across three semesters. An additional level of subjectivity seeps into the self-reported inference around what instructors attribute learning to and depending on how negatively or positively predisposed a student might be while self-reporting accomplishment. It would enrich our study to extend or juxtapose it with the perceptions of students who experienced teaching and learning at different periods.

We acknowledged some of the factors affecting instructor choices, but we did not ask instructors about perceptions of their quality. Let us take for instance instructor readiness, as a function of prior experiences, training and resources (Narwani, 2008) and related biases; while in our questions we did not prompt them directly to tell us about the quality of their institutional supports such as training, technical support and instructor readiness programs. We recognize the institution-level support and resources, such as training to adapt instruction using technology can be a strong predictor of effective online instruction (Chiasson et al., 2015; Narwani and Arif, 2008; Smith and Sivo, 2012; Teo, 2011).

Understanding the use and effectiveness of educational technology was not the primary focus of our design. The design of our questions around the use of technology only allowed us to see high-level information. The responses we garnered were ratings - ‘Compared to in-person instruction, how effective are the following aspects of online instruction? - Live Instruction Online, Recorded Lectures, Course Assessments, Student Questions and Discussion’ as perceptions of usefulness because these aspects are related to the perceptions of effectiveness We asked about general perceptions of their experiences without asking specific questions about technology access and support. According to Zappavigna (2013) one of the reasons for the impenetrability of ‘tech talk’ (what non IT professionals refer to when they find it hard to understand the helpdesk or IT resident guru), is technologists hold extensive tacit knowledge about working with technology. Because we lacked more information from instructors about their perceptions of technology, its use and the technological knowledge we cannot draw conclusions around the technical aspects of using educational technology, instructional design or training. Questions about effectiveness of technology resources and the resulting technology mediated teaching and learning merit a future study by possibly extending our IMC Model, by adding dimensions related to measures of quality and learning theories.

We looked at instructional design in terms of changes made to course features, but we did not delve into instructional design as a process. When we developed our study to seek out instructors’ perspectives on experiencing the pandemic-induced remote teaching shock, we acknowledged there was not much room to plan or redesign courses during the first semester of teaching in the pandemic-onset period; however, there might have been some opportunity for redesign in later teaching semesters. We recognize there is much to be studied about design strategies in terms of the underpinning design principles and learning experience design journey.

Drawing upon testimonials shared by instructors about their instructional choices, challenges and changes in for ERT, we identified four instructional response styles at a high level. These results are crucial cross-culturally but limited to our sample and can be part of future studies on instructional design and pedagogical approaches in online education to test the generalizability of our findings.

Additionally, our analysis might be constrained by some of the limitations of our methodology. Primarily, in using an online questionnaire we acknowledge the following possible limitations and assumptions:

1. Surveys rely on the participant to self-report, providing insights into their subjective experiences, perceptions, and beliefs. The limitations of self-report data have been well-described (Nisbett & Wilson, 1977), but surveys remain a vital and widely used tool for soliciting reports on behavior and for elucidating attitudes.
2. Although open-ended questions allow instructors to provide detailed and nuanced responses - offering insights into their thoughts, attitudes, and beliefs, the respondents can be prone to fatigue in having to repeatedly answer questions requiring lengthy responses.
3. Although close-ended questions can provide structured response options, a cognitive load and enable easy data analysis and comparison across respondents, we are limited in what we can elucidate using ratings alone.
4. The length of the questionnaire may have contributed to a potential for halo effect, a cognitive bias that can affect our data. In lengthy questionnaires respondents might be prone to fatigue in responding to multiple questions; thus the later questions in a questionnaire might not always get as much attention as prior ones. In our questionnaire

we prompted respondents to reflect on their overall experience early in the survey, before the cycle of questions about individual courses, enabling them to respond early. However, while our strategy might help overcome the loss of opportunity to gather rich information later in the questionnaire, it also might not be rich in all the information a respondent might think of later because of the time they had to reflect on their experiences teaching each course.

Additionally, we recognize that there are some inherent limitations of the analytical methods. For example, in using the Wilcoxon rank-sum test we acknowledge the following may be possible:

1. Because the Wilcoxon rank-sum test is based on the ranks of the data and not on the raw data values, it can lead to a loss of information, potentially reducing the test's sensitivity.
2. In smaller sample sizes, the test may have limited power to detect significant differences between groups, making it more challenging to identify true effects. As sample sizes increase, the test becomes more powerful.

In terms of the quality of the sample data, the number of courses reported in our sample was substantial (200), but the number of instructors was small (51) spread between two countries. We could only look at the individual differences in approaches across countries, course modalities and periods of teaching without diminishing the effect size. The limited dataset did not permit us to (1) conduct a thorough cross-sectional analysis by gender, race and other individual identity information we collected, nor (2) make generalizations easily. An interesting characteristic was the collective number of years of teaching experience of instructors in our sample. A large number of the instructors had over 20 years of experience teaching at a college or university; meaning their past experiences and history of teaching could be a factor in their

responses to the disruption. As a study of a behavioral intervention we are interested in raising questions about the effects of individual differences. Is there any relationship between years of teaching experience and instructional approaches or outlook towards instructional changes? Is there any continued influence on instructors' outlook towards technology adoption in instruction?

Our survey has enabled us to develop a general understanding and a reasonably strong set of conclusions around cross-cultural instructional responses and changes in the U.S. and China emerging from the pandemic-induced remote instruction in the format of a descriptive analysis. We can extend our study further in order to analyze our observations in the light of additional frameworks in the fields of behavioral psychology, positive psychology and management of change. Opportunistic planning might be a lens to observe response styles and perhaps an interesting direction for future research. A future direction can also include developing and testing a framework to guide teacher-education and instructional design informed by our findings.

### **Conclusion**

The lives of students and faculty in both China and the U.S. were disrupted by the COVID-19 pandemic, leading to an abrupt transition to online teaching and learning. But there were important differences in how this disruption played out in the two settings, as well in how instructors and institutions responded. Resilience was a top theme named by experts in instructional design (Hamlen, 2020; Moore and Hill, 2020; Quintana et al., 2021).

Resilience in teaching and learning is associated with agility, adaptability and inherently malleability of course instruction. The abrupt transition to online teaching and learning put to the test years of scholarship in online education. A report by the World Bank group (Muñoz-Najar et

al., 2022) illuminated the lessons from the global experiment in the delivery of remote learning in K12 education. In some ways, our report is an attempt to do the same for higher education, providing a close-up on lessons on individual instructional responses.

Our inquiry served multiple overarching goals. A primary goal was to develop an understanding of how college instructors responded to the pandemic that can contribute (a) to a general understanding of technology adoption and use, (b) as well as insights that might be useful in future emergencies. The secondary, but foundational, goal was focused on how existing models of online course instruction and constrained decision-making might account for instructors' experiences.

In the natural order of research, old models lead the way for innovative models oriented to emergent contexts. During the pandemic-induced disruptions to higher education we witnessed nuanced approaches to online teaching and learning. We presented a model for characterizing features of instructional design and instructional response mechanisms - the Interaction Communication Modality model, by extending existing frameworks and knowledge. Our work has attempted to overcome a gap in instructional design research for categorizing and identifying multi-modality and cross-modality changes in instruction. In many courses reported on instructors said they wanted to see some of the instructional changes made during ERT persist even after conditions returning to in-person instruction, such as pre-recorded lectures and asynchronous materials in the U.S. and China. Many instructors in the U.S. expressed the desire to improve ways to promote student engagement, motivation and collaboration.

Using IMC our study enabled us to see a significant difference in the choice for narrative and conversational interactions in instruction between the U.S. and China. Narrative interactions featured twice as many times in courses reported on in the sample from China, reflecting the

value ascription to didactical instruction and the response to crisis as maximizing control.

However, minimizing choice was not the approach taken by most of the instructors in our sample from the U.S. There is a clear distinction between the paradigms of instruction across cultures. The theory of learning underpinning the instructional changes we observed in the U.S. strongly reflects technology mediated socio-constructivist approaches. Because of our small sample size and limited context of analysis we cannot gloss over the need for further work to replicate and test across multiple contexts.

### ***Cross-Cultural Story of Instructional Change***

The responses of universities to disruption in higher education have varied greatly, with different approaches observed in the U.S. and China. Bounded rationality recognizes instructors made decisions within a complex and dynamic environment, facing time constraints, limited resources, and incomplete information. As a result, decision-making processes are influenced by cognitive biases, heuristics, and simplified decision rules. Those who study heuristics and motivation are better positioned to understand the intricacies around how our minds ascribe worth to 'expend' the needed amount of cognitive effort for a goal, but more or less, our brain tries to minimize effort, even for decision making. When we contrasted approaches for coping and adapting instruction during ERT, we found similarities in the U.S. and China in terms of (a) profound exploratory response styles and (b) generally positive trends with lowered teaching effort ratings after teaching for multiple semesters in hybrid and online formats. The divergences were interesting because of the import of cultural differences in terms of biases towards the role of teachers and students.

Overall, across both cultures instruction presents a story of resilience. Under the suboptimal conditions of ERT, where instructors did not have the space, time or resources at their

disposal as needed for adapting to online instruction, instructional changes reflect approaches to structure courses in ways to minimize the effects of external disruption on student learning. Instructors in the U.S. and China made modifications necessary to preserve continuity, albeit using differentiated approaches. In the U.S. instructors tapped into the agency of their students, as a resource and as a tool to mediate their learning process in unprecedented conditions. Instructors' commitment to maintain continuity of learning in the face of disruptions put additional demands on them. The greater room for instructor initiative in the U.S. both made it more difficult to respond but also led to a greater incidence of changes that will carry through post-pandemic. In China, the instruction reflected a lack of learner autonomy driven changes, and thereby a more teacher-centered approach.

Disruption in higher education is a complex and dynamic phenomenon shaping the future of education. The lessons learned from remote instruction in the U.S. and China in response to the pandemic-induced disruptions were diverse, reflecting the unique challenges and opportunities for creativity in the two different cultural contexts. These lessons from instructional perspectives are even more pertinent as the field of higher education continues to evolve. It will be crucial for institutions to carefully navigate the changing landscape and find innovative ways to adapt to the disruptions while ensuring the quality and relevance of the future of education.



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## Appendix 1

### Instructor Questionnaire

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English ▾

Please use the "dropdown box" above to select your preferred language

欢迎！请从右上方的选项里选择问卷首选语言。

歡迎！請從右上方的選項裏選擇問卷首選語言。





English ▼

We invite you to be part of an international research study that looks at the experience of faculty members in the U.S. and China in response to the COVID-19 Pandemic.

If you choose to participate, you will be asked to fill out a survey and think about how your life and professional experiences may have changed in response to the COVID-19 Pandemic.

All the information we collect is anonymous. This study has been judged by the University of Michigan Health Sciences and Behavioral Sciences Institutional Review Board and the Beijing Normal University Institutional Review Board to be exempt from IRB oversight.

For additional information or answers to questions, please email Kevin Miller ([kevinmil@umich.edu](mailto:kevinmil@umich.edu)) or Zhang Xuemin ([xmzhang@bnu.edu.cn](mailto:xmzhang@bnu.edu.cn)).

By clicking on the forward button below, you are consenting to participate in this research survey. If you do not wish to participate, click the "X" in the top corner of your browser to exit.

We will start off with some demographic and open ended questions in the first section. In the second section we will ask some specific questions about the courses you taught this term.

We estimate that it will take 10 to 20 minutes to complete this survey.

我们诚邀您参与此项调查。此项调查旨在于研究新型冠状病毒肺炎（COVID-19）对美国与中国教职工的影响。

如果您选择参与，我们要求您填写一份问卷调查表，并回顾您的生活和教学经历是如何因新型冠状病毒肺炎而改变的。

我们收集的所有信息均是匿名的。此项研究已经由密歇根大学健康科学与行为科学机构审查委员会（IRB）和北京师范大学人体保护与伦理审查委员会判断决定，其实施不受IRB监督。

若需进一步的信息或有任何疑问，请电邮联系  
美国: Kevin Miller ([kevinmil@umich.edu](mailto:kevinmil@umich.edu)).  
中国: 张学民 ([xmzhang@bnu.edu.cn](mailto:xmzhang@bnu.edu.cn)).

单击下面的前进按钮，即表示您同意参加此次研究问卷。如果您不想参加，请单击浏览器上方的“x”退出。

在第一部分中，我们将从一些个人背景资料和开放式问题开始。在第二部分中，我们将询问您关于本学期课程的具体问题。

此问卷调查预计需要10-20分钟完成。

What is your gender

Male

Female

Other or don't want to answer

Please select your University

The University of Michigan

Beijing Normal University

Shaanxi Normal University

Other

What is your primary academic department?

What is your Academic Rank or Title?

Professor

Associate Professor

Assistant Professor

Lecturer


Other (please specify)

Please answer the following:

How many years  
experience do you  
have teaching  
college students?

How many years  
have you been  
teaching at your  
current University?



English 

Choose one or more races that you consider yourself to be:

Black or African American

Asian

American Indian or Alaska Native

Native Hawaiian or Pacific Islander

White

Other or don't want to answer

Are you Spanish, Hispanic, or Latinx?


Yes

No

Prefer not to answer





English 

We would like to learn about your experiences since the transition to online instruction in response to the COVID19 crisis.

What are the major changes you made in your courses and teaching in response to the COVID-19 Pandemic?

What were the biggest challenges you faced?

Compared to in-person instruction, how effective are the following aspects of online instruction?

	Much Worse	Worse	The Same	Better	Much Better
Live Instruction Online	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recorded Lectures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Course Assessments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student Questions and Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How are courses currently taught at your institution?

- Online for all courses
- In-person for all courses
- Some courses are in-person and some are online



English


First we will ask about the second semester (Winter/Spring) of 2019-2020. Did you teach any courses during this period?

Yes

No





English 


Next we will ask you a few questions in turn about each undergraduate course taught during Winter/Spring 2019-2020

How many \*undergraduate\* courses did you teach that semester (Winter/Spring of 2019-2020)? (Please enter a numeral)







English 

How would you describe this course?

- Undergraduate lecture class in one section
- Undergraduate lecture class with multiple sections
- Seminar with discussion
- Laboratory or methods course
- Field experiences or other practical instruction
- This course was always an online course (MOOC, or other online format)

How many students were enrolled in this class?

How was this course taught?

What software and online technology tools helped you in instruction? Please specify any technologies you used for the first time or in a new way? What technologies do you intend to reuse?


Please rate the following compared to teaching this course in a different format (online vs. in-person)

	Very low	Low	Medium	High	Very high
Your effort involved in teaching this course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your effort needed to monitor student learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your understanding of students' learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student engagement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student workload	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Course-related peer-to-peer interaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student motivation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student attendance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality of student learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What are the main challenges you face teaching this course?

What would you do differently in teaching this course online again?



English 

Next we will ask you a few questions about each graduate class, in turn.

How many \*graduate\* courses did you teach that semester (Winter/Spring or 2019/2020)? (Please enter a numeral)



## Qualitative Data Analysis - Instructional Design: Analyzing Changes

Table A. Dimensions for Categories for Instructional Changes

Primary and Secondary Dimensions	
Dimension level	Dimension
<b>Primary</b>	<b>Modality</b>
<i>Secondary</i>	Online
<i>Secondary</i>	In-person
<i>Secondary</i>	Hybrid
<b>Primary</b>	<b>Communication</b>
Secondary	Synchronous
Secondary	Asynchronous
<b>Primary</b>	<b>Interaction</b>
Secondary	Narrative
Secondary	Conversational
<b>Primary</b>	<b>Extant</b>
Secondary	In-Course Modality
Secondary	Across-Course Modalities

Table B. Coding Scheme with Examples

<b>Instructor questionnaire qualitative analysis</b>		
<b>Coding Scheme for Instructional Change</b>		
<b>Category</b>	<b>Description</b>	<b>Anchor Example</b>
<b>Synchronous Discussions</b>	Involving live video conferencing with students and instructors connected remotely using online technology for class discussions	I would semi-flip the course. I would only lecture for part of the class time and encourage discussion and interaction for the remaining time.
<b>Synchronous Lectures</b>	Involving lecture instruction using video conferencing whereby students are connected with the instructor using online technology	I taught in person on a Wednesday and remotely on the following Monday, with no time to do anything than duplicate remotely what I'd been doing in person.
<b>Pre-Recorded Lectures</b>	Involving lectures delivered using online technologies to students to watch at their own pace	Prerecord lectures, and use lecture time for learning-supportive activities. Reduce the amount of time that students spend on Zoom.
<b>Informal Asynchronous Discussions</b>	Involving outside-of-class interactions among students or between students and instructors such as virtual office hours	Add some additional opportunities for social networking and relationship-building.
<b>Synchronous Assessment</b>	Involving assessments in synchronous class sessions as indication of engagement such as of student virtual attendance or participation	I would have changed the grading system to have some kind of accountability measure for virtual attendance in some way to encourage more student participation and attendance.
<b>Asynchronous Assignments</b>	Involving assessment of coursework to work on outside of synchronous sessions including flipped classroom style work	Add asynchronous activity for 1 hour
<b>Asynchronous Materials</b>	Involving engaging students in instructional materials in asynchronous formats to work on outside of class sessions including flipped classroom style work	Convert it to a designed-for-remote-learning course.
<b>Synchronous Group Discussions</b>	Involving engaging students in synchronous discussions in groups to promote student relationship building and interactions, and engage with instructional materials	more breakout sessions

## Appendix 2

### Fisher's Exact Test Results

Instructional Change Interactions Types between Cultures Comparison

Interaction Type	Instructional Change Category	China	U.S.	Fisher's Exact test for Count data
<b>Conversational</b>	Synchronous Discussions	21	18	Fisher's Exact Test for Count Data data: intergroup p-value = 0.9583 alternative hypothesis: two.sided
	Synchronous Group Discussions	10	6	
	Synchronous Assessment	3	2	
	Informal Asynchronous Discussions	1	1	
<b>Narrative</b>	Asynchronous Materials	21	12	Fisher's Exact Test for Count Data data: intergroup p-value = 0.04387 alternative hypothesis: two.sided
	Asynchronous Assignments	4	6	
	Synchronous Lectures	25	5	
	Pre-Recorded Lectures	6	5	

## **Appendix 3**

### **Comprehensive List of Variables in Dataset**

Variables recorded in the cross-cultural study's dataset are grouped into 3 high level categories: Instructor, Course Instruction and Mediating factors. The total of 32 variables recorded are the following:

- Instructor
  - Experience level
  - Demographic/Identity
  - Discipline
  - Region
  - Cultural Context
  - Life Aspects
  - Institutional policy (Change)
  
- Course Instruction
  - Teaching Period
  - Course Level
  - Course Type
  - Class size
  - Software Tech Choices

- Technology effectiveness (perception)
- Instructional Choices
- Aspect of Instruction
- Multiple Teaching formats
- Challenges
- Student engagement (perception)
- Changes in Course
- Change in Teaching
- Other Qualitative Comments
- Mediating factors
  - Motivation
  - Interaction type and modality
  - Instructional style
  - Multiple periods (waves of teaching cycles/semesters)
  - Language
  - Acceptance of Technology
  - Institutional support
  - Course load
  - Underlying pedagogy
  - Teaching Expertise level
  - Instructional effectiveness (perception)



## Appendix 4

### Instructor Questionnaire Qualitative Data Analysis - Response Styles

Table C. Coding Scheme with Examples

Instructor questionnaire qualitative analysis		
Coding Scheme for Response Styles		
Category	Description	Anchor Example
<b>Exploratory</b>	Using words primarily showing interest or willingness in exploring options, technologies, approaches and experimenting with them in instruction.	Increasing the application of technology in teaching, diversified teaching
<b>Compensatory</b>	Using words primarily exhibiting concern for gaps in instruction in different formats and approaches to compensate for gaps relative to in-person instruction.	Establish empathy with students
<b>Minimalistic</b>	Using words primarily minimizing the extent of changes or prioritizing the necessary aspects of in-person instruction.	Use online platforms to perform courseware and performance management, and use instant communication to ensure students' participation
<b>Averse</b>	Using words primarily exhibiting the aversion towards modified instructional formats or technology use for instruction.	I have always loved in person teaching--now I will feel even more grateful for it