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Mid-Atlantic State Virtual Program Teachers' Instructional Planning Beliefs And Practices

Yanping Mo

College of William and Mary - School of Education, yymo@wm.edu

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MID-ATLANTIC STATE VIRTUAL PROGRAM TEACHERS' INSTRUCTIONAL
PLANNING BELIEFS AND PRACTICES

A Dissertation

Presented to

The Faculty of the School of Education

The College of William and Mary in Virginia

In Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

By

Yanping Mo

March 2023

MID-ATLANTIC STATE VIRTUAL PROGRAM TEACHERS' INSTRUCTIONAL
PLANNING BELIEFS AND PRACTICES

By

Yanping Mo

Approved March 2023 by

Tom J. Ward, Ph.D.

Committee Member

Peggie M. Constantino, Ph.D.

Committee Member

Leslie W. Grant, Ph.D.

Co-Chairperson of the Doctoral Committee

James H. Stronge, Ph.D.

Co-chairperson of the Doctoral Committee

Dedication

This dissertation is dedicated to my husband and my son for your forever love and support; and to my mother, my parents-in-law, and my siblings for all your love, understanding, and support. Your love, compassion, and support make my pursuit of this degree possible.

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Abstract

Technology development is shifting teaching modality and online education has become a normal teaching mode. This shift informed teachers of changes in instructional planning. To help teachers better understand planning for online instruction, this study investigates Mid-Atlantic State Virtual Program K-12 teachers' online instructional planning beliefs and practices through a sequential explanatory mixed method. A total of 73 teachers participated in the survey, and 15 were interviewed. Through descriptive statistical analysis and thematic analysis, this study reveals that (1) eight elements are identified as key elements to online instructional planning. Among them, six align with the framework used in this study. Engagement and time are two newly found elements (2) Most teachers prioritize content design, learning activities and/or teaching strategies, and communication and/or interaction over learning tools and media, learner analysis, and assessment and/or evaluation. However, they use all six elements regularly in their planning. (3) There are no statistically significant differences among teachers with different online teaching experiences in prioritizing or the frequency of using the six identified elements. (4) High school teachers place less importance on content design than middle and elementary teachers. High school teachers also attach less importance to learner analysis than elementary school teachers. (5) Online instructional planning differs from face-to-face planning in many aspects. This study discusses many challenges to teaching online. Teachers who participated in this study suggest that new online teachers be prepared for online instruction with appropriate dispositions, knowledge, and skills. In addition, administrators should play an essential role in supporting teachers.

MID-ATLANTIC STATE VIRTUAL PROGRAM TEACHERS' INSTRUCTIONAL
PLANNING BELIEFS AND PRACTICES

CHAPTER 1

INTRODUCTION

Online education has become an integral part of contemporary higher and K-12 education (Kubo, 2009) since its incipient occurrence decades ago. During the Coronavirus Disease (COVID-19) pandemic, institutions of learning worldwide overwhelmingly shifted their instruction to an online modality, effectively making it a new normal (Andarwulan et al., 2021; Shah et al., 2021; Siswati et al., 2020). This dramatic shift in instructional delivery has informed and transformed educators' thinking about instructional planning (McElrath, 2020), engendering momentous challenges that have yet to be fully met.

As online instruction was not an option for most school systems prior to the COVID-19 pandemic, teachers at large had not been adequately prepared for virtual instruction (Babincakova & Bernard, 2020; Barbour & Harrison, 2016; Graham et al., 2019; Gurley, 2018; Pace et al., 2020). Not surprisingly, quite a number of challenges cropped up in the course of teaching online. The most frequently reported difficulties teachers reported include the following: digital divide, technology, and internet disparities (Van Dijk, 2006); lack of face-to-face relationships and of a sense of community (Barbour & Harrison, 2016; Toppin & Toppin, 2016; Wu, 2016); teacher preparation and training (Barbour & Harrison, 2016; Carpenter et al., 2015; Graham et al., 2019; Gurley, 2018; Pourreau, 2015); online teaching skills (Trust & Whalen, 2020); technology integration and connectivity; student participation and engagement; communication and interaction; student well-being and work-life balance (An et al.,

2021). Many of these challenges are closely related to instructional planning, including teaching skills, technology use, student well-being, and communication and interaction.

Responding to these challenges and enhancing effectiveness in online instruction calls for an in-depth study of online instructional planning. Although a plethora of studies have made various explorations in online instruction, few focused directly on online instructional planning and the elements involved in that planning, raising a need for focused research in this area. This study is designed to fill this practical gap and call forth further thinking and research.

The Rise and Development of Online Instruction

K-12 online teaching evolved from distance education, which underwent three significant phases: (1) print-based correspondence courses, (2) electronic technology-based distance education, and (3) computer- and Internet-based learning (Clark, 2013). According to Clark (2013), in the phase of print-based correspondence-style learning, print media such as textbooks played a major role in K-12 distance education. Electronic technology-based distance education includes audio-based distance education in the 1920s and 1930s for supplemental instruction such as the Ohio School of the Air, which is the first educational radio system, and the Wisconsin School of the Air, which is the longest-running educational radio system. This also includes video-based distance education as supplemental in-school experiences, including the educational film in 1910 (e.g., Rochester, New York public schools), educational television programming in 1933 (e.g., Experimental Visual Broadcasting Station W9XK in the University of Iowa), out-of-school educational broadcasting (e.g., Sesame Street on PBS stations), and compressed or full-motion videoconferencing systems in the early 1990s. Computer- and Internet-based learning was popular in the 1980s and 1990s (e.g., elementary school experiments with Plato III). Today, the term “distance teaching” refers mainly to online teaching in which

educators deliver at least 80% of the course content online through computers and the Internet (Allen & Seaman, 2011; Shelton & Saltzman, 2005). Audio, video, computers, and the Internet are critical technologies in online education (Roffe, 2002).

Keeping pace with technology development, K-12 online education grew rapidly in the 21st century. Student enrollments increased from 507,000 in the academic year 2004-2005 to more than one million in the academic year 2010-2011. Since then, the online student population has continued to grow exponentially. In the U.S., about 30% of students take at least one online course (6,022,105 students), and enrollment in online learning is still increasing (Allen & Seaman, 2017). Recent *Keeping Pace Reports* show that online schools' enrollment is growing by about 6% annually (Digital Learning Collaborative, 2020). More and more schools have adopted online instruction as a significant or supplementary teaching format. Prado et al.'s (2020) questionnaire in the *American Instructional Resources Survey* gathered information from thousands of teachers. The results show that 43% of math teachers, 38% of ELA teachers, and 25% of science teachers reported having been required or recommended to include online software in the curriculum. This is echoed by Schwartz et al. (2020), who claimed that in the United States, many schools either increased face-to-face instruction with online content or lessons or provided a hybrid of face-to-face and online instruction; additionally, they enrolled students in credit-bearing fully online courses.

In 2020, the COVID-19 pandemic accelerated this trend in the United States and worldwide. According to a United Nations' (2020) report, the COVID-19 pandemic severely influenced nearly 1.6 billion learners in more than 190 countries. School closures affected up to 94% of the world's students. Globally, most schools adopted online instruction to replace in-

person instruction to reduce education disruption. Online learning is becoming a new normal (Andarwulan et al., 2021; Shah et al., 2021; Siswati et al., 2020).

The Call for Effective Online Instruction

Remarkably different from face-to-face teaching, online instruction requires a disparate set of skills and competencies (An, 2021; Davis & Niederhauser, 2007). The prime competency is to design pedagogy, instructional content, instructional events, facilitation, and assessment (Martin et al., 2019). Online instruction presupposes careful planning in order to promote student learning (Kaden, 2020). However, many teacher-training programs ignore or short-shrift online pedagogy in their training programs, leaving trainees with limited knowledge of and experience with online learning and teaching (McAllister & Graham, 2016).

Even though online teaching has a lot in common with face-to-face teaching, a growing body of research affirms that the skills appropriate to online learning are unique (Barbour et al., 2013; Davis & Niederhauser, 2007; Pulham & Graham, 2018). Issues such as the usage of technology tools and learning management systems (De Gagne & Walters, 2009), implementation of appropriate pedagogical strategies (Brinthaupt et al., 2011), adapting to the role of facilitator (Johnson, 2014), and time commitment (Lewis & Abdul-Hamid, 2006) are identified as significant differences. Teachers cannot simply repackage existing traditional course content (Gallien & Oomen-Early, 2008) and embed presentation slides and lecture notes into a learning management system. Rather, they need to consider the type and sequence of learning content and student learning ability (Cornelius & Glasgow, 2007), communication, and relationship with students (Dykman & Davis, 2008). Carefully planned instruction can help students focus more on learning (Dykman & Davis, 2008) and minimize student misunderstanding and confusion (Almala, 2007; Li & Irby, 2008). Correspondingly, teachers

who teach online need to familiarize themselves with the practicalities of instructional planning so as to be better prepared to adapt to student learning and deal with potential concerns (Albrahim, 2020).

Online instructional planning needs to focus on many aspects, including learning content, directions, learning activities, communication and interaction, and assessment. Research shows that clarifying learning objectives and expectations in upfront planning can provide students with clear guidance (Dykman & Davis, 2008). Well-written directions can assist students in maintaining a required pace and keeping track of assignment due dates (Fish & Wickersham, 2009). In addition, online courses should offer a variety of activities and assignments that involve both lower-and higher-level cognitive processing (Dunlap et al., 2007) and provide both a sense of connectivity for achieving learning objectives (Zsohar & Smith, 2008). Effective teacher-student interaction contributes to positive student performance, grades, and course satisfaction (Appana, 2008; Gallien & Oomen-Early, 2008).

The Importance of Instructional Planning

Lesson planning is the cognitive process of envisioning and thinking protectively about what will happen in the classroom during a lesson (Jalongo et al., 2007) and devising accordingly a coherent system of activities designed to promote cognitive-structural development on the part of students (Panasuk et al., 2002). The goal of planning is to enhance effectiveness and efficiency in student learning. Through creating, arranging, and organizing instructional events, teachers can engage students in learning (Burden & Byrd, 2003). Effective teachers make solid, practicable instructional plans grounded in an in-depth understanding of the students, content, technology, and instructional strategies. The depth of instructional planning is developed

from inquiry into why children act and respond the way they do and how to support each child's learning (Marshall, 2012).

Instructional planning significantly affects the quality, quantity, and nature of classroom instruction (Smith, 1977). It entails teachers using different teaching techniques to carefully plan and fine-tune lessons (Orlich et al., 2004) to meet students' learning needs and provide them with compelling learning experiences (Thompson & Stryker, 2010). Understanding the lesson planning procedures and theoretical elements is critical to teachers (Straessle, 2014).

Instructional planning is therefore an essential, indispensable necessity in effective teaching frameworks and standards. For instance, Danielson (2007), Marzano (2006), Stronge (2007), and Stronge and Hindman (2016) all listed instructional planning as a basic domain in their effective teaching frameworks. Similarly, teaching standards such as InTASC (Council of Chief State School Officers, 2013) and International Society for Technology in Education (ISTE) (Crompton, 2017) include benchmarks and guidelines for instructional planning. Additionally, many researchers have developed instructional planning models (such as the ADDIE model, Kemp model, Gagne's Nine Events model), specifying planning elements, such as preparing learners, teaching content, teaching strategies, and assessment approaches.

The role of instructional planning in these frameworks, standards, and planning models indicates that instructional planning is critical for effective instruction. Being the logical first step in and the underlying foundation of the teaching process, planning prescribes what to prepare and include in instruction (Stronge & Xu, 2016). Planning for curriculum, instruction, and assessment must be thoughtful, well-prepared, and organized (Stronge, 2018); this will lead to satisfying and productive student impact (Stronge & Xu, 2016). To conclude, instructional

planning requires a systematic mindset in teaching and holds primary importance in both face-to-face and online instruction.

Despite researchers' claim that instructional planning frameworks are critical for successful educational lesson plans (Cruickshank, 2018; Erickson, 2008; Hunter, 2004; Stronge, 2018), the existing planning frameworks, standards, and models are mainly designed for face-to-face instruction; there is little or no research focusing specifically on online instructional planning.

Online Instructional Planning Elements Identified Through Systematic Review

As there is no online instructional planning framework identified in existing literature, Mo et al. (2021) conducted a systematic review of 21 publications retrieved from five databases. The study then summarized and synthesized six key elements for online instructional planning: content design, learner analysis, learning activities and/or teaching strategies, learning tools and media, communication and/or interaction, and assessment and/or evaluation. The current study builds on these six elements, the main points of which are as follows:

- *Content design* includes setting the instructional objectives, selecting learning materials and resources, chunking, and sequencing the learning content based on a good understanding of the subject matter and the learner; specific online materials distributed to students through electronic channels and website content accessible to the learners via the website platform.
- *Learner analysis* includes the analysis of students' cognitive level, personalities, learning preferences, students' technology accessibility, and digital literacy.
- *Learning activities and/or teaching strategies* include tutorials (self-paced learning); web conferences (synchronous meetings in a virtual environment); online forums (bulletin

boards, discussion groups, or news groups); virtual collaborative workspaces; simulations; goal-based scenarios, and active learning through lecture video presentations; recent new articles and videos; guest speakers' synchronous chat, authentic projects, and problem-solving situations.

- *Learning tools and media* include multimedia, software/Apps, cloud computing, and LMS, such as Moodle, Blackboard, Google Docs, VoiceThread, TED Videos, YouTube Videos, PowerPoint, Camtasia, Snagit, Tellagami, Pow Toon, Adobe Presenter, etc.
- *Communication and/or interaction* identify communication in an online setting that can be asynchronous written communication (such as independent study or online learning) and synchronous audiovisual communication (such as videoconferencing). Interactions can be learner-instructor interaction, learner-content interaction, learner-learner interaction, and learner-interface interaction.
- *Assessment and/or evaluation* can be individual work, group work, tests, papers, oral or written tests conducted in the instructor's presence through videoconferencing. It can also be done by integrating cognitive assessment, performance assessment, and portfolio assessment into online learning settings.

The Rationale for This Study

To date, online instruction has become a new normal. However, many teachers still feel challenged to provide effective online instruction (Ferri et al., 2020; Arcueno et al., 2021). During the COVID-19 Pandemic, teachers had to redesign courses and teaching to support their students in a fully online environment. However, many of them felt ill-prepared to lead effective online instruction. Howard et al. (2021) sounded out 222 teachers from 20 countries about their readiness for online teaching. Participants reported negative perceptions of their readiness for online teaching. Early research also reveals some challenges regarding online instruction. For instance, Archambault and Crippen (2009) canvassed 600 U. S. K-12 online teachers and found that their primary concerns about online teaching included the amount of time involved, control over the content, and issues related to students. The teachers reported that the amount of time spent on online teaching workload exceeded what was spent on face-to-face teaching. Again, the teachers claimed to have little control over the content, which as a rule had been created by content designers or curriculum specialists. Thus, they could hardly control the source of the content, the organizing or sequencing of the content, and the evaluation of the content. As for student issues, online teachers also expressed their frustration in dealing with various student-related issues, such as student unfitness for online learning and the disparity in learning outcomes among students. To prime teachers optimally for effective online instruction, this study focuses on instruction planning, the first logical step to actual instruction, and aims to provide teachers with a better understanding of beliefs and practices in online instructional planning.

Statement of the Problem

Although some online teaching standards, such as the National Standards for Quality Online Courses (International Association for K-12 Online Learning [iNACOL], 2011), and the

National Standards for Quality Online Teaching (Virtual Learning Leadership Alliance, 2019), have prescribed guidelines for online instructional planning, the guidelines are overarching for the entire instructional teaching process rather than specifically focusing on instructional planning. A plethora of relatively recent studies have also probed online instructional planning. However, the foci of these studies are on creating online instructional planning models (Almekhalafi, 2020; Wang, 2021), the implementation of instructional models (Carnahan & Mensch, 2014), the validity and reliability of the online instructional design model or standards (Adelstein & Barbour, 2016; Adelstein & Barbour, 2017), the use of technology tools (Brunvand & Byrd, 2011; Di Paola et al., 2017), and teachers' and students' perceptions about the instructional design (Barbour, 2005; Barbour, 2007; Barbour, 2008; Barbour & Adelstein, 2013). No research sheds light directly on how teachers plan for online instruction. Therefore, studying online instructional planning would make for a better understanding of teachers' online instructional planning practice. This study will focus specifically on key elements teachers from Mid-Atlantic State Virtual Program (MASVP) include in their planning, their priorities, their beliefs and practices in online instructional planning, and the frequency with which they use these elements to plan instruction. MASVP is a supplemental virtual program of the Mid-Atlantic State Department of Education serving students in Mid-Atlantic schools by providing flexible options for the diverse educational needs of students and their families. By focusing on MASVP teachers, this study offers a unique opportunity to examine the planning process for fully online instruction. Teachers from this organization are all professionals in online instruction and received online instructional training prior to teaching. Thus, this study will investigate MASVP teachers' online instructional planning, precisely the key elements, priorities, frequency of using them in online instructional planning, and teachers' beliefs and practices.

Research Questions

RQ1: How do elementary, middle, and high school teachers from MASVP prioritize the importance of the six identified elements in planning for online instruction?

RQ2: Is there any significant difference in elementary, middle, and high school teachers' prioritization of the six identified elements in planning for online instruction based on teacher's years of online teaching experience?

RQ3: How frequently do elementary, middle, and high school teachers from MASVP use the six identified elements in planning for online instruction?

RQ4: Is there any significant difference in the frequencies with which elementary, middle, and high school teachers use the six identified elements in planning for online instruction based on teacher's years of online teaching experience?

RQ5: What are the beliefs and practices of teachers from MASVP in planning for instruction online?

Significance of This Study

Studying MASVP teachers' priorities and frequency they use the six elements is beneficial to teachers in planning for effective online instruction. Uncovering teachers' online instructional planning beliefs and practice helps teachers and school administrators better understand teachers' needs and provide directions for designing appropriate professional development programs to help teachers improve their planning and instruction. In addition, it also provides guidelines for teachers who intend to teach in an online environment.

Definitions of Key Terms

Online Instruction

Online instruction in this study is defined as instruction and content that is delivered primarily (80%-100%) through the Internet (Watson et al., 2005). It encompasses a wide range of educational activities, tools, and resources that are delivered via the Internet. In online instruction, most of the curriculum is delivered online and interactions occur mostly or entirely at a distance (Allen & Seaman, 2008). It is interchangeably used with distance learning, virtual learning, cyber learning, and e-learning (Barbour et al., 2011, p. 8). Other terms such as online teaching, online learning, and online course, are frequently used roughly synonymously in the published literature and practice. Due to the evolving status of the terminology, this study focuses primarily on online instruction. Nevertheless, other terms mentioned above will be used as dictated by the extant literature. More detailed definitions of this term are given in Chapter Two.

Instructional Planning

Instructional planning is the process of preparing a framework to guide teacher actions (Clark & Yinger, 1979), in which teachers design and structure learning activities, instructional strategies, and resources to meet student needs based on the state's standards, the school's curriculum, and student data (Stronge, 2018). Instructional planning is also a systematic specification of instruction, including objectives, presentation, activities, materials, guidance, feedback, and evaluation (Chaudry & Rahman, 2010), and a systematic process involving the necessary tools and techniques to address current problems, the goal of the instruction, and approaches to reach the goal (Stronge & Xu, 2016).

Instructional planning in this study refers to a systematic process of planning, including planning for learning content, learners, learning activities and/or teaching strategies, learning tools and media, communication and/or interaction, and evaluation and/or assessment.

Instructional Design

Instructional design is the process of improving the quality of teaching and learning (Braden, 1996), the theory and practice of design, development, utilization, management, the evaluation of processes and resources for learning (Seels & Richie, 1994), and the art and science that enables learners to accomplish specific tasks which they could not accomplish without learning (Broderick, 2001). This study uses instructional design interchangeably with instructional planning and teaching planning.

CHAPTER 2

REVIEW OF RELATED LITERATURE

The intensive use of the Internet has impacted and shifted traditional teaching in ways unimaginable only a few years ago. Few, if any could have predicted where alternative delivery platforms such as online instruction are today. With more and more schools adopting or coopting online instruction, its effectiveness has become a concern of practitioners, school leaders, and researchers. Effective teaching requires educators to plan instruction carefully because instructional planning is the first step and lays the foundation for effective delivery (Stronge, 2018). To gain a comprehensive understanding of online instructional planning, this chapter conducts a review of related literature.

This review explores selected topics associated with online teaching and, more specifically, instructional planning for online teaching. The chapter begins with a review of the background on the emergence of online education and then examines the definitions and characteristics of K-12 online teaching, instructional planning and teaching effectiveness, and instructional planning: traditional versus online instruction. These sections are intended to provide background information relevant to key instructional planning elements and how they are developed and implemented for online instructional planning.

Background on the Emergence of Online Education

K-12 online education is a relatively recent phenomenon, having started in the 1990s (Barbour, 2018). However, its origins can be dated back to early forms of distance education in 1910 (Saettler, 2004). The evolution of online education is closely associated with the development of technology. Following technology development, online instruction has experienced a significant change in learning modalities from early years' print-based learning to electronic-based learning to today's Internet-based learning. This evolution has led to the rapid growth of online programs and virtual schools. The following section provides a brief introduction to the background of online education.

Historical Timeframe for Development of K-12 Online Education

K-12 online education derives from distance education. The development of online education has run parallel with the development of technologies "from print to media and communication technologies to the Internet revolution" (Waters et al., 2014, p. 380). The development of K-12 distance education went through three phases: print-based correspondence learning, electronic technology-based distance education, and Internet technology-based distance education (Clark, 2013). In the print-based correspondence learning phase, students' learning was supervised by correspondence study centers. The local schools provided regular lessons on regular school days, supervised students' work, and returned the lessons to the study center. The study center prepared and graded the lessons (Broady et al., 1931). In this phase, print media such as textbooks played a major role in K-12 distance education.

With the development of information technology, print-based learning methods were largely replaced by electronic learning methods in the early 21st century (Clark, 2013). The first electronic technology-based learning method was audio distance education, with facilitation by

radio, telephone, and audio conferencing. It was used to meet certain students' special needs and supplement the curriculum by offering elective topics that were not available locally (Clark, 2013, p. 557). Video-based education began in 1933 with educational television programming used to provide 15-minute evening broadcasts to groups of children who sought to meet merit badge requirements. Later, due to the emergence of cable TV and direct-to-home satellite systems, out-of-school educational broadcasting programs on TV channels and educational stations became popular.

In the 1970s, with educational satellites used to provide high-quality video-based instruction, distance learning became a major focus as a supplement to in-school experiences. In the 1990s, closed-circuit educational telecommunication networks using compressed or full-motion videoconferencing systems for two-way video and two-way audio emerged, with about 80 percent of U. S. public television stations providing educational programming to elementary or secondary schools (Clark, 2013). "Later state networks used fiber optic technologies to deliver video, data, and voice services that supported video-based distance education, computer networking, and telephony. By 2006, this state-owned and financed network connected over 700 two-way full-motion video classrooms in K-12 schools" (Clark, 2013, p. 559). In the 1980s and 1990s, computer-assisted learning in computer labs was adopted by many schools to supervise students' individualized learning. Later, the development of computer conferencing made real-time interaction possible. Thus, multimedia tools were used to create interactive, engaging computer-based content and learning environments (Clark, 2013).

Overall, online learning evolved from early print-based correspondence learning to electronic technology-based distance learning to computer-and Internet-based online learning.

The development of technologies and instructional approaches set the foundation for the booming trend in virtual schools.

Online Programs and Schools

With the advancement of technology, online schools and programs have grown rapidly. The first known K-12 online learning program was offered by a private school, Laurel Springs School, in 1991 (Barbour, 2012). The first public online school was the Utah Electronic High School which was set up in 1994 (Clark, 2003), followed by the Hawaii E-School created in 1996, the Virtual High School Global Consortium, and the Florida Virtual School (FLVS) in 1997 (Clark, 2003; Friend & Johnston, 2005; Pape et al., 2005). Each of these schools and programs provided students with onsite supplemental online learning. Students were enrolled in normal brick-and-mortar schools but had one or more classes online to supplement their face-to-face courses (Barbour, 2017). Since then, virtual schools have been developing quickly. By the turn of the millennium, there were three existing statewide virtual schools (Florida, New Mexico, and Utah) and three more (Illinois, Kentucky, and Michigan) in the planning stages (Clark, 2000). By 2001, existing and prospective virtual schools had spread to 14 states (Clark, 2001).

In addition to virtual schools, cyber charter schools have developed as a significant supplemental form of K-12 virtual learning. Cyber charter schools are different from virtual schools in that they are publicly funded full-time schools (Water et al., 2014). It is “a public institution that is guided by a charter and offers a tuition-free educational option... Virtual charter schools are unique because they deliver educational programs over the Internet” (Baker et al., 2005, p. 133). Whereas virtual schools generally refer to online supplemental programs for students who attend brick and mortar schools but want to or need to supplement their course options. The first full-time cyber charter school was Choice 2000 in California, which was set

up in 1994 (Darrow, 2010). At that time, most of the full-time K-12 online learning programs were operated as charter schools (Molnar et al., 2015). K12, Inc., founded around 2000, was a for-profit corporation that operated cyber charter schools (Waters et a., 2014). From 1999 to 2004, there were an estimated 60 cyber charter schools in 15 states enrolling over 16,000 students (Huerta & Gonzales, 2004). Two years later, this number had grown to an estimated 147 cyber charter schools with 65,354 students in 18 states (Rotherham, 2006). As of 2021, the number of public charter schools and campuses had increased to more than 7,500 (White et al., 2021).

The Enrollment of K-12 Students in Online Education

Enrollment in K-12 distance education has increased dramatically since the 2000s. By 2001, around 40,000 to 50,000 students engaged in some form of K-12 distance education. In 2002-2003, 300,000 students enrolled in online courses via public and private schools (Newman et al., 2003). By 2007-2008, the number increased to 666,000, with over one million in fully online K-12 courses in 2010-2011 (Picciano & Seaman, 2009). The online student population has grown exponentially since then. In the middle of the 2010s, there were an estimated 4.6 million K-12 students engaged in online learning (Gemin et a., 2015), and about 30% of U.S. students took at least one distance education course, a total of 6,022,105 students (Allen & Seaman, 2017). A recent report shows that enrollment in online schools is growing by about 6% per year (Digital Learning Collaborative, 2020). According to a policy guide to virtual schools 2021, the full-time virtual school enrollment in 2019-2020 is more than 330,000 students, and full- and part-time virtual enrollment increased dramatically during the 2020-21 pandemic year with nearly 40% of enrollment declines in traditional public schools (Erwin, 2021). Erwin explains:

In the 2020-21 school year, Florida saw over a 100% increase in full-time enrollment at the Florida Virtual School and a student increase of nearly 19,000 in district-operated virtual programs. Similarly, Colorado districts with large online schools experienced large increases in enrollment, and virtual charter schools in Wisconsin experienced an 84% enrollment increase. (2021, p. 2)

Definitions and Characteristics of K-12 Online Instruction

K-12 online instruction is different from traditional face-to-face teaching in many ways. To ensure effectiveness of online instruction, teachers need to understand the definition and characteristics of online instruction. Different researchers and organizations have defined it from different perspectives. There also are various descriptions of the characteristics of online education; however, the key characteristics are technology, learning content, and communication methods.

Definitions of Online Instruction

Online instruction is defined differently, with several terms used interchangeably, as aforementioned in Chapter 1. Some definitions focus on the content, some on the delivery technologies, and some on the learning environment. Some examples are listed below:

- Online instruction refers to the instruction and content delivered primarily through the Internet (Watson et al., 2005).
- Online instruction is used interchangeably with Virtual learning, Cyber learning, e-learning (Barbour et al., 2011, p. 8).
- Online learning is teacher-led education that takes place over the Internet, with the teacher and student separated geographically, using a web-based educational delivery system that includes software to provide a structured learning environment. It may be

synchronous (communication in which participants interact in real-time, such as online video) or asynchronous (communication separated by time, such as email or online discussion forums). It may be accessed from multiple settings (in school and/or out of school buildings) (Watson et al., 2013, p. 8).

- Online learning can take many forms: asynchronous, synchronous, or both; supplemental or full-time; cohort-based or self-paced (Lawrence & Harris, 2021). Asynchronous online instruction refers to instruction facilitated by media such as e-mail and discussion boards and providing flexible time and place for learners to learn and do assignments (Hrastinski, 2007). Asynchronous instruction does not involve ongoing communication with teachers and other students. Instead, it is often completed through web-based resources offered in multiple formats (e.g., video, audio, imagery) and shared interactively via social media (Lawrence & Harris, 2021). Synchronous teaching involves media such as video conferencing and chat, teachers and learners can interact in real-time (Hrastinski, 2008).
- Online learning encompasses a wide range of educational activities, tools, and resources delivered via the Internet. These can be schools where most of the curriculum is offered online, and interaction between students and teachers is mostly or entirely at a distance (Allen & Seaman, 2008).

Based on the definitions listed above, online instruction in this study is defined as teacher-facilitated and cohort-based instruction, asynchronous or synchronous. It is used interchangeably with online teaching, virtual learning, cyber learning, e-learning (Barbour et al., 2011), and distance learning, in which more than 80% of all of the content is delivered online. It encompasses a wide range of educational activities, tools, and resources that are delivered via the

Internet. This can be accomplished through schools in which the greater part of the curriculum is delivered online, and interaction between students and teachers and between students is mostly or entirely at a distance (Allen & Seaman, 2008).

Characteristics of K-12 Online Instruction

Online instruction is different from face-to-face instruction in many aspects, such as (1) different learning experiences, (2) different communication ways, and (3) different learning environments (Ascough, 2002). Researchers find that the key factors for enhancing online learning are multimedia (Liaw, 2008; Liaw & Huang, 2013), learning content (Uppal et al., 2018), and interaction (Bolliger, 2004).

Multimedia. Technology integration into education is a key feature of online learning. Technology use in online education mainly focuses on the effects of computers, the Internet, and software (Bulman & Fairlie, 2016). Technological instructional media includes computers, interactive video, and multimedia systems. The technological tools or media that instructors commonly use include multimedia, software/Apps, and cloud computing and learning management systems (LMS), such as Moodle, Blackboard, etc., and technological tools, such as Google Docs, VoiceThread, TED Videos, YouTube Videos (Dikli, 2003). Software commonly used to record course materials include PowerPoint, Camtasia, Snagit, Tellagami, Pow Toon, and Adobe Presenter (Arslan, 2020).

Technology is an essential factor in online teaching, going beyond mere employment of hardware, add-on activities, or fancy worksheets (Hadley & Sheingold, 1993) to facilitate pedagogy. According to Earle (2002):

Technology must be pedagogically sound and go beyond information retrieval to problem-solving; allow new instructional and learning experiences not possible without

them; promote deep processing of ideas; increase student interaction with the subject matter; promote faculty and student enthusiasm for teaching and learning; and free up time for quality classroom interaction—in sum, improve the pedagogy. (p. 7)

Technology can promote online learning in every aspect, such as learning resources, communication and interaction, and learning activities. For instance, pre-and in-class videos, podcasts, narrated PowerPoints, or reading texts provide synchronous engagement and interaction for students with different learning styles (Arslan, 2020). LMS platforms can be used to create course content, such as pre-and in-class materials. Forums (including an online bulletin board, threaded discussion forum, web board), chats, instant messenger, email and voice mail, online boards groupware, and audio/video conferencing facilitate communication and collaboration. E-portfolios, concept maps, and online notebooks are useful tools for the personal construction of knowledge (Hamat & Embi, 2010).

Learning Content. Learning content is broadly defined as the topics, themes, beliefs, behaviors, concepts, and facts, often grouped within each subject, or learning area under the rubrics of knowledge, skills, values, and attitudes, that are expected to be gained and form the basis of teaching and learning (UNESCO-IBE, 2013). Online learning content is broader and richer than face-to-face learning material. Kumar et al. (2021) describes it as:

[A]ny document, presentation, audio, or video file that may be used to deliver e-learning. This includes PowerPoint presentations, guides, reports, whitepapers, charts, and graphs, illustrations, videos, case studies, infographics, problem-solution scenarios, simulations, screen captures, animated gifs, checklists, e-books, articles, blog posts, interviews, etc., as study material or lectures, assignments, projects, test questions, question-answer bank, practice exercises. (pp. 4-5)

Learning content is comprehensive and accurate study material distributed through electronic channels (Kumar et al., 2021), which should be well designed to ensure a successful student experience, offering compatible technology with a range of learning management systems (Gudanescu, 2010). In addition, materials online are often multilinear and arranged in a hypertext format. The nature of hypertexts may distract students' attention to endless links rather than focusing on what is learning (Kymes, 2005). Therefore, teachers need more guidance to navigate students learning the targeted content.

Interactions. Communication and interaction are among the most significant factors for successful online learning (Bolliger, 2004). Communication in an online setting can be asynchronous written communication, such as independent study or online learning, or synchronous audiovisual communication, such as videoconferencing (Garrison, 2000). Asynchronous resources enable students' work to be shared amongst a technologically networked learning community. The synchronous process enhances motivation by obliging students to be present and participate in the face-to-face cyber environment (Chen et al., 2005; Wang & Chen, 2007). Online interactions can be learner-instructor interaction, learner-content interaction, learner-learner interactions (Moore, 1989), or learner-interface interaction (Hillman et al., 1994). Opportunities for interactions could be provided through automated instruction, communication tools, and discussions tools built-in learning management systems.

To conclude, technology, learning content and communication are three salient features of online instruction. Learning content forms the bedrock of learning. Communication promotes learning effectiveness and technology can facilitate communication and help engage students in learning.

The Role of Instructional Planning and Teaching Effectiveness

Effective instruction involves effective planning, delivery, and assessment. Planning is the first logical step, laying a foundation for delivery and assessment (Stronge, 2018), and plays an enormous role in the complex teaching process, as the teacher attempts to weave what students should learn with how they should learn it. Effective instruction begins with careful, thorough, and organized planning (Misulis, 1997). Successful teaching needs careful preparation (Stronge, 2018). A solid planning process involves student analysis, content organization, selection of learning activities and teaching strategies, communication and interaction, methods for assessing student understanding, and ways to evaluate instructional effectiveness (Mo et al., 2021).

Effective teachers attend to student needs and value student engagement, incorporate different learning approaches, build on students' prior knowledge (Stronge & Xu, 2016), and plan instruction effectively in the light of students' backgrounds, interests, skills, and needs (Danielson, 2007). Highly effective teachers are able to articulate learning objectives, make connections between current, past, and future lessons, and engage students by taking into account their needs and interests (McEwan, 2002). Effective teaching involves what teachers know and do (content and pedagogy) as well as an awareness of their own and their students' identities, backgrounds, and dispositions (Jensen et al., 2019). Effective teachers stress the selection and organization of learning content, construct blueprints to address the curriculum, plan units and lessons in advance, make connections across disciplines (McEwan, 2002), sequence material to promote students' cognitive and developmental growth (Panasuk et al., 2002), plan multiple resources (Allington & Johnston, 2000), and make full use of available resources to improve students' learning (Buttram & Waters, 1997).

To ensure a positive online learning environment, teachers need to analyze students' learning objectives; select appropriate learning materials; design activities, discussion topics, projects, and tests; envision any potential technical or academic problems; and test the feasibility of the online course (Yang & Cornelious, 2005). When organizing the learning content, teachers need to consider the students' needs and students' ability to learn (Zheng & Smaldino, 2003). Effective online teachers are able to use digital technologies to facilitate student learning effectively, such as motivating and monitoring student learning and maintaining flexibility with time and place, communicating and interacting with students, building meaningful and supportive relationships with students, providing timely feedback, and assessing student learning in multiple ways (DiPietro et al., 2008). These educators use online pedagogy, design quality online materials, implement online teaching and learning methodologies, and offer quality feedback to students (Brennan, 2003).

Instructional Design/Planning: Traditional Versus Online Instruction

Instructional design involves involves considerations of many aspects, such as learners, learning materials, teaching strategies, learning activities, and assessment and evaluation. Technology integration is stressed throughout the teaching process.

Definitions of Instructional Design and Instructional Planning

Instructional design improves the quality of teaching and learning (Braden, 1996) and maximizes instructional value for learners (Chaudry, 2010). The most commonly cited definition of instructional design describes it as the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning (Seels & Richie, 1994). However, some researchers criticize this description, arguing it does not reflect the complexity of the design practice (Kanuka, 2006). Jones and Davis (2008) claim that the instructional design

process provides a framework for the teacher to plan, develop, and adapt instructional activities according to the needs of students and the requirements of course content. Broderick (2001) provides a comprehensive description:

Instructional Design is the art and science of creating an instructional environment and materials that will bring the learner from the state of not being able to accomplish certain tasks to the state of being able to accomplish those tasks. Instructional Design is based on theoretical and practical research in cognition, educational psychology, and problem-solving. (p. 1)

Magliaro and Shambaugh (2006) identify eight instructional design stages: (1) define instructional goals; (2) conduct an instructional analysis, including task analysis and information processing analysis; (3) identify entry behaviors/ learner characteristics; (4), develop performance objectives; (5) select an instructional method; (6) assemble instructional material; (7) plan and conduct formative evaluation; and (8) plan and conduct the summative evaluation.

Instructional planning involves a teacher using appropriate strategies and resources to plan and structure learning activities to meet students' needs based on the state's standards, the school's curriculum, and data (Stronge, 2018). It is a process in which the teacher uses appropriate curricula, instructional strategies, resources, and data to address diverse students' needs (Georgia Department of Education, n.d.). Instructional planning is also a systematic process in which teachers use necessary tools and techniques to determine present status and future direction, design actions to accomplish desired changes, and use methods to simplify decision making and identify the most effective and efficient instruction and assessment (Stronge & Xu, 2016). To conclude, instructional planning is systematic instruction specification; this includes objectives, presentation, activities, materials, guidance, feedback, and evaluation.

In planning practice, educators divide the learning process into smaller units and break down lessons into basic blocks of instruction to make teaching efficient and coherent (Stronge & Xu, 2016). Stronge and Xu explain, “Unit plans include topic, goals and objectives, content outline, learning activities, resources and materials, evaluation. And lesson plans include objectives, introduction/hook, content outline, methods and procedures, resources and materials, lesson activity, summary/closure, evaluation procedure” (2016, p. 9). Alternative models for unit/lesson planning include setting learning outcomes, assessing students’ prior knowledge, defining objectives, forming essential questions, selecting appropriate activities, setting the sequence of activities, assessing student learning, interpreting the results, and reflecting on the results (Ko, 2012).

Instructional design has been described as a science of planning (Leshin et al., 1992). The essential phases of the planning process are analysis, evaluation, comparison, and decision-making related to the development of drafts or blueprints and their recursive evaluation (Seel et al., 2017). Instructional design and instructional planning both refer to a systematic instructional planning process in which instructors set learning objectives, select and organize learning materials and resources, design activities and teaching strategies, and prescribe evaluation methods. The purpose of instructional design and planning is to maximize the value of instruction for the learner. Thus, these two terms are used interchangeably in this study.

A Brief History of Instructional Design

Instructional design is, at root, heavily influenced by John Dewey, Edward Thorndike, and others around the turn of the twentieth century. Dewey (1910) envisioned a specific linking of science to learning theory and educational practice. Thorndike (1913) investigated principles of learning that could be directly applied to the teaching process and developed a body of

instructional design principles that included task analysis and teaching methods based on his research findings and student evaluation methods (Tennyson, 2010). Instructional design procedures date back to World War II (Dick, 1987; Tennyson, 2010), when psychologists and educators were required to develop training materials for the military services. They explored instructional system design for the content and tasks analysis and tested design variables to achieve specific learning outcomes.

In his 1954 book, *The Science of Learning and the Art of Teaching*, B. F. Skinner describes ways to expedite human learning and characteristics of effective instructional materials, calling for educators to “present instruction in small steps, require overt responses to frequent questions, provide immediate feedback, and allow for learner self-pacing” (Reiser, 2001, p. 59). It offers insights on instructional planning. In 1962, Robert Mager wrote a book entitled *Preparing Objectives for Programmed Instruction*, describing ways to write learning objectives. In 1949, Ralph Tyler, the father of the behavioral objective movement, published *Basic Principles of Curriculum and Instruction*, believing that objectives should not be vague and advocating clarification of each objective with behavior terms (Reiser, 2001). In the 1950s, Benjamin Bloom published *Taxonomy of Educational Objectives* (Bloom, 1956), underscoring the classification of learning objectives and the hierarchical relationship among the various types of outcomes, which boosted behavioral objectives. The emergence of criterion-referenced testing in the 1960s also affected the development of the instructional design process. As it could “measure how well an individual can perform a particular behavior or set of behaviors, irrespective of how well others perform” (Reiser, 2001, p. 60), criterion-referenced tests allow educators to make decisions about the expected behaviors by assessing student entry-level behavior. Thus, criterion-referenced tests became a central feature of instructional design

procedures (Reiger, 2001). At this stage, instructional design was influenced by behaviorism, defined primarily as “Small, incremental steps sequenced to link information in a logical order; active learner participation in responding to instructional stimuli with immediate feedback as a positive reinforcer. Learner progress is based on successful attainment of defined behavioral objectives” (Tennyson, 2010, p. 2).

In 1965, Robert Gagne’s publication, *The Conditions of Learning*, marked a significant development in instructional design from three perspectives. First, Gagne described five domains of learning outcomes: verbal information, intellectual skills, psychomotor skills, attitudes, and cognitive strategies. These five domains set the learning objectives for instructional planning. Second, Gagne described nine events or nine activities of instruction, which form guidelines for instructional design. Third, he described the hierarchical relationship within the intellectual skills domain. Simply put, some skills are subordinate, some are superordinate. Superordinate skills are built on subordinate skills. To learn superordinate skills, students must master subordinate skills. This conception indicates that teachers should identify and sequence the learning skill level in the instructional planning process. In the mid-1960s, Scriven (1967) proposed formative and summative evaluation of instructional materials to assess the effectiveness of instructional materials.

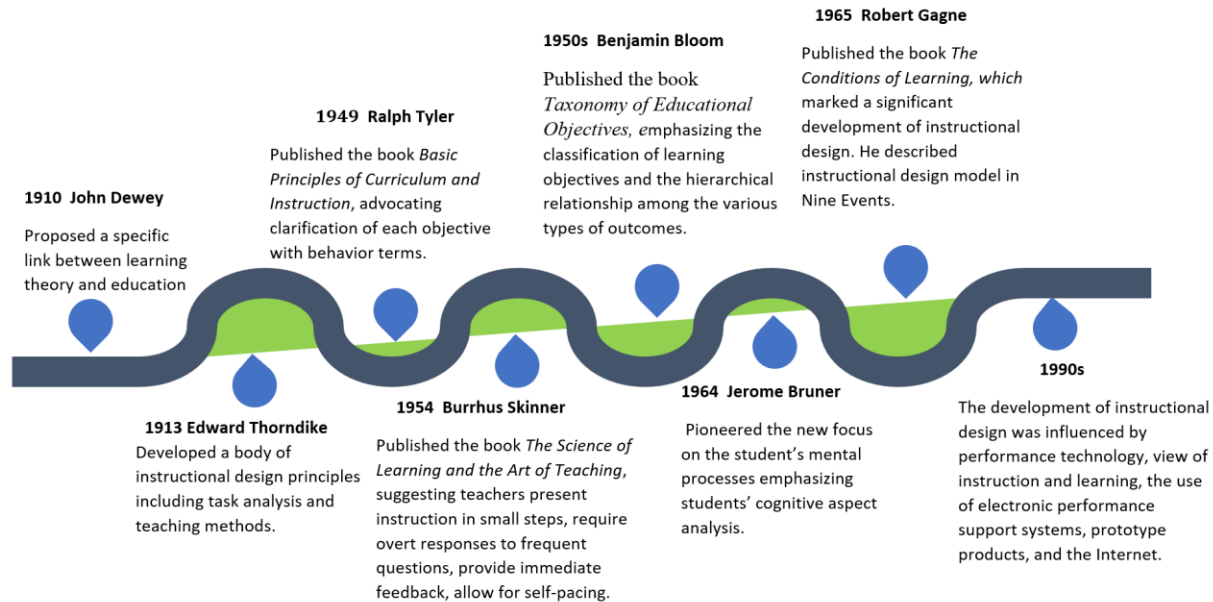
In the late 1960s and throughout the 1970s, the cognitive approach gradually replaced the behavioral paradigm, beginning with Bruner’s (1964) new focus on the student’s mental processes rather than stimulus-response-reinforcement. Throughout the 1960s and 1970s, task and content analysis gave way to cognitive aspect analysis, such as problem-solving analysis, situation and context analysis, etc. (Tennyson, 2010). Instructional design researchers better-understood learning conditions and developed instructional design models by connecting aspects

such as task analysis, objective specification, and criterion-referenced testing in the early and mid-1960s. Gagne, Glaser, and Silvern are the pioneers who described instructional design models (Reiser, 2001). The variety of instructional design models grew immensely in the 1970s (Reiser, 2001). Many new models are iterations of earlier ones, including the Dick and Carey model (1978) and the Kemp Model (1971). By the end of that decade, more than 40 such models had been identified (Andrews & Goodson, 1980). One decade after that, instructional design continued to develop and was adopted by many businesses and industries.

During the 1990s, several factors affected the development of instructional design (Reiser, 2001). First, the use of performance technology in education expanded the scope of instructional activities. The second factor is the view of instruction and learning. Beliefs in constructivism resulted in several instructional principles. For instance, learners were required to (a) solve complex and realistic problems; (b) work together to solve those problems; (c) examine the problems from multiple perspectives; (d) take ownership of the learning process (rather than being passive recipients of instruction); and (e) become aware of their role in the knowledge construction process (Driscoll, 2000). This indicates teachers need to design “authentic” learning tasks (Reiser, 2001, p. 63). Third, electronic performance support systems reduced the need for training. Fourth, the emergence of prototype products allowed teachers to use less time to design quality instructional materials compared with conventional instructional design (Reiger, 2001). Finally, in 1995, the increasing use of the Internet for distance learning made it clear that such instruction cannot be a replica of face-to-face instruction. Effective distance instruction needs to be carefully designed in light of Internet-based courses (Institute for Higher Education Policy, 2000). Figure 1 below shows a timeline of the critical instructional design events.

Figure 1

The Timeline of the Important Instructional Design Events



Face-to-Face Instructional Design

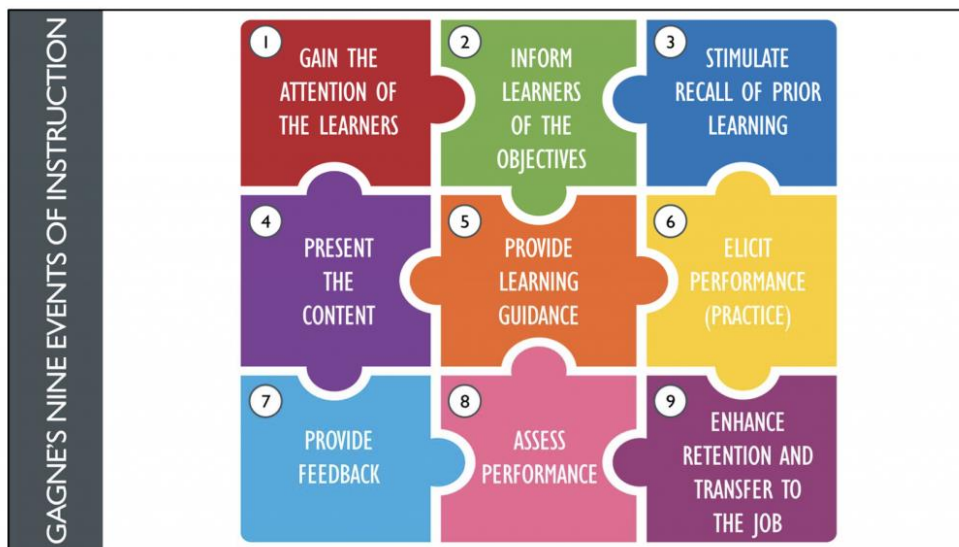
Since the 1990s, many instructional design models, frameworks, and standards have appeared. Although each emphasizes different aspects, the key elements included in instructional planning models, frameworks, and standards are similar. Most of them include learners, content, activities, teaching methods, and evaluation. Some examples are shown below in instructional planning models, teaching standards, effective teaching frameworks, and instructional planning research.

Key Elements in Instructional Planning Models. By the 1990s, more than 40 instructional planning models had been developed. Among these, the most popular and widely used ones include Gagne's Nine Events, ADDIE model, ASSURE model, Dick and Carey model, and Kemp model.

Gagne and his team created Gagne's Nine Events in 1965. The nine events are *Gaining attention, Informing the learner of the objective, Stimulating recall of prior learning, Presenting the stimulus, Providing learning guidance, Eliciting performance, Providing feedback, Assessing performance, and Enhancing retention and transfer*. The makeup of this model is presented below in Figure 2. The events are not sequential. Teachers are allowed to choose what to include and the sequence in using them based on the context, including students, topic, and other situations (Ngussa, 2014).

Figure 2

The Image of Gagne's Nine Events

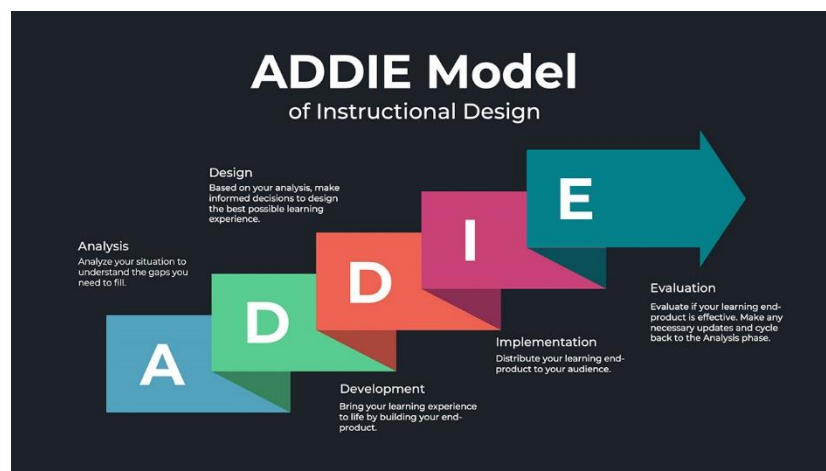


Notes. This image is retrieved from “*Gagne's nine events of instruction*” by S. Kurt (2021), Educational Technology.

The ADDIE model was created in 1975 (Branch, 2009). ADDIE is an acronym for five phases of planning: *Analysis, Design, Develop, Implement, and Evaluate*. According to Branch (2009), the *Analyze* phase is to identify the probable causes and analyze the situation for a gap. The *Design* phase involves preparing a set of functional specifications to close the gap and provide students with the best possible learning experience. The *Develop* phase identifies all the resources needed to undertake intentional learning. The teacher prepares the learning environment and engages the students in the *Implement* phase. Finally, the *Evaluate* phase assesses the quality of the instructional products and processes, cycles back, and updates planning. Figure 3 provides a visual representation of the ADDIE model (DeBell, 2020).

Figure 3

The Image of the ADDIE Model

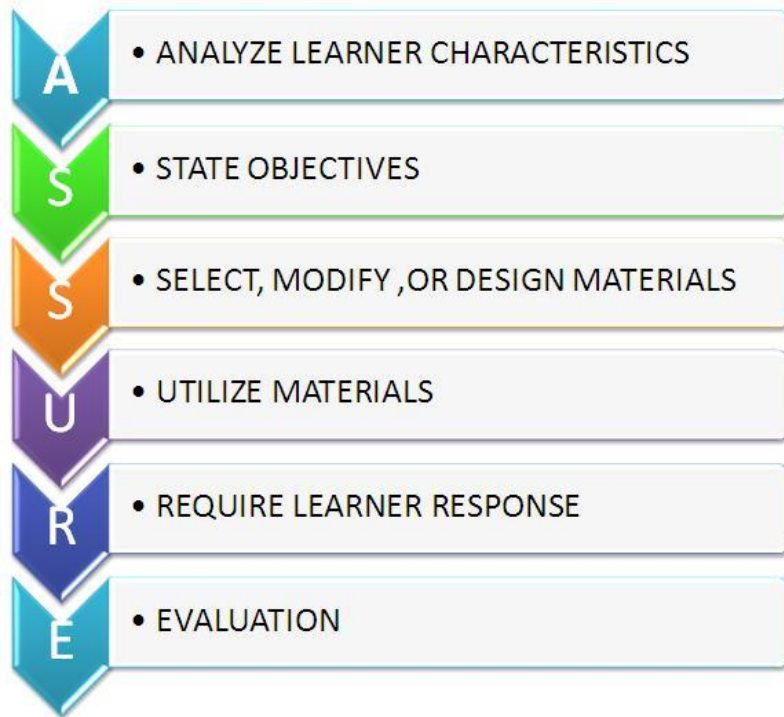


Note. This image is retrieved from “What is the ADDIE Model of instructional design?” by A. DeBell (2020), Water Bear Learning.

The ASSURE model was created by Heinrich and Molenda in 1999 (Lefebvre, 2006). ASSURE is an acronym for *Analyze, State objectives, Select materials, Utilize materials, Require learner responses, Evaluate*. Figure 4 below shows the components of the model. This model consists of step-by-step approaches to creating a lesson that effectively integrates technology and media to improve students' learning (Smaldino, 1999). ASSURE aligns with the National Education Technology Standards for teachers and curriculum standards from the local to national level and can be applied to any school or district lesson plan pattern (Smaldino, 1999). The first step is to analyze students' characteristics, including general characteristics, entry competencies, and learning styles. Next, the instructor formulates learning outcomes or objectives. During the third step appropriate instructional strategies, technology, media, and materials are selected. After that, teachers need to use selected technology, media, and materials to help students achieve their learning objectives. Finally, the teacher should evaluate students' learning outcomes and the effectiveness of the planning (Ibrahim, 2015).

Figure 4

The Image of ASSURE Model

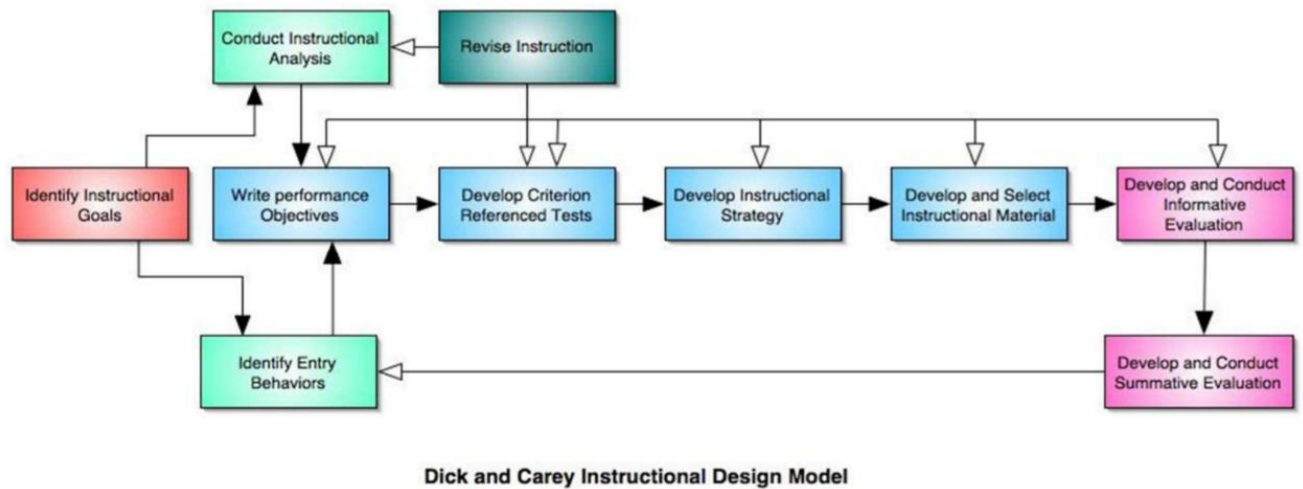


Note. This image is retrieved from “*Comparative analysis between system approach, Kept, and ASSURE instructional design models*” by A. A., Ibrahim (2015), International Journal of Education and Research.

Created by Dick and Carey in 1978, the Dick and Carey Model consists of ten inter-dependent components in procedural or sequential steps, with each component depending on another one. In Figure 5, the components connected by black arrows are theories, procedures, and techniques teachers or designers use to design, develop, evaluate, and revise the instruction. In contrast, the components linked by white arrows represent evaluation and revision points (Ibrahim, 2015).

Figure 5

The Image of Dick and Carey Model



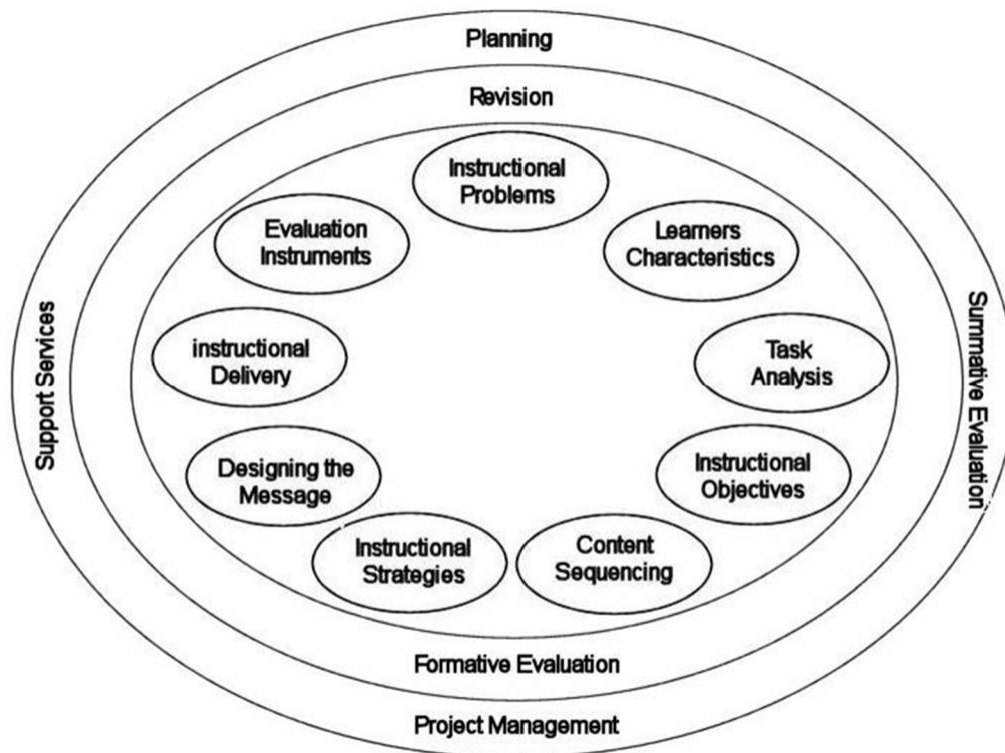
Note. This image is retrieved from “*Comparative analysis between system approach, Kept, and ASSURE instructional design models*” by A. A., Ibrahim (2015), International Journal of Education and Research.

Kemp created in 1985 the Kemp Model, which consists of nine components: (1) instructional program identification and goal specification of an instructional course; (2) examination of learners’ characteristics based on the instructional decisions; (3) subject content identification with task analysis related to goals and purposes; (4) instructional objective specification; (5) instructional unit in arranged, in logically sequential order of learning; (6) instructional strategies design to meet the mastery of lesson objectives; (7) plan and develop instruction; (8) evaluate instruments for measuring course objectives; finally, (9) resource. The image of this model is presented in Figure 6 below. All elements are interdependent and can be performed simultaneously. Teachers can start from anywhere. The instructional solution is determined by learning needs, goals, priorities, and constraints (Ibrahim, 2015). This model

emphasizes “interdependencies of each step in the process, highlights the importance of the evaluation, and recognizes more environmental factors in educational settings (resource and support, such as budget, facilities, time, equipment, personnel, and materials) (Ibrahim, 2015, p. 264).

Figure 6

The Image of the Kemp Model



Note. This image is retrieved from “Comparative analysis between system approach, Kemp, and ASSURE instructional design models” by A. A., Ibrahim (2015), International Journal of Education and Research.

Key Elements in Teaching Standards. Some organizations developed teaching standards to set expectations for effective teaching, such as *Interstate New Teacher Assessment and Support Consortium (InTASC) Model Core Teaching Standards and Learning Progressions for Teachers 1.0* (CCSSO, 2013) and *ISTE Standards for Educators: A Guide for Teachers and Other Professionals* (Crompton, 2017). The seventh standard of InTASC 2013 is planning for instruction, involving (1) planning learning experiences, (2) teaching strategies, (3) learner analysis, and (4) evaluating. Standard five of ISTE requires educators to design authentic, learner-driven activities and environments that recognize and accommodate learner variability.

Key Elements in Effective Teaching Frameworks. Apart from instructional design models and teaching standards, some researchers studied the framework for effective teaching, in which instructional planning and preparation is one domain of the framework. Some notable researchers in this area include Danielson (2007), Marzano (2007), Stronge (2007), and Stronge and Xu (2016). They all emphasize learning objectives, students, learning content, instructional strategies, and assessment. In addition to these common elements, Marzano (2007) also emphasizes communication and interaction, classroom management, and student-teacher relationship. Both Marzano (2007) and Stronge (2007) emphasize pacing and homework. The detailed elements in the planning domain of their frameworks are presented in Table 1 below.

Key Elements in Instructional Planning Research. Instructional planning elements teachers include in their planning are aligned with those in the models, standards, and frameworks. Most of them include content, objectives, learning activities, teaching methods, evaluation; some also include understanding learners. However, these elements' sequence and priorities are inconsistent among researchers and teachers. For instance, Clark and Yinger (1977) suggest that teachers should first "specify objectives," then "select learning activities," then

“organize learning activities,” and then “specify evaluation activities” (p. 280). This is known as a rational means-end model for instructional planning. However, other researchers found sequential variation among teachers using them. For instance, Taylor (1970) canvassed teachers and reports that secondary teachers considered students’ learning needs, abilities, and interests during planning, followed by the content to be taught, learning goals, and teaching methods. However, Zahorik (1975) found that most of the teachers who participated in his study began planning by content and learning objectives. Peterson et al. (1978) asked teachers to voice their planning thoughts and decisions by thinking aloud during planning. Teachers reported they spent the most time pondering the content to be taught, followed by instructional strategies and activities, and the least time focused on learning objectives.

Brown (1988) echoes this point; he found that middle school teachers spent most of their time on content topics during planning, learning materials, learning activities, and evaluation of student learning. He also noticed that teachers took the learning goals from educational departments’ documents or policies; thus, learning goals are not part of their planning (Hofer & Harris, 2019). In Yinger’s (1977) case study of five months of a first-grade teacher’s planning, teachers emphasized selecting, organizing, and sequencing instructional activities and routines in a problem-based approach to planning. Overall, not all teachers started their instructional planning from objectives. Some teachers plan content first (e.g., Zahorik, 1975), some students first (e.g., Taylor, 1970), and some learning activities first (e.g., Young et al., 1998).

Overall, instructional planning elements included in effective teaching frameworks, teaching standards, instructional models, and research are similar. Most of them emphasize learners, content and resources, teaching strategies or learning activities, and evaluation. The differences lie in the details of some domains, such as pacing (Marzaro, 2007), assignments, and

timing (Stronge, 2007). Evidently, frontline teachers' planning practice is also highly aligned with the elements in the models, frameworks, and standards. However, sequences differ, and priorities vary in using the elements in planning. This may result from their teaching contexts or situations. It may also result from the philosophy of Gagne's Nine Events and Kemp Models, which allows for flexibility in the sequence. There are also differences between experienced and inexperienced teachers.

Table 1*An Overview of the Key Planning Elements in the Four Frameworks*

Researcher	Content of Planning	Key Elements in the Framework
Danielson (2007)	Knowledge of content and pedagogy Knowledge of students, instructional outcomes Knowledge of resources, coherent resources, and student assessment	content, instructional strategies, students, learning resources, assessment
Marzano (2007)	<ol style="list-style-type: none"> 1. What will I do to establish and communicate learning goals, track student progress, and celebrate success? 2. What will I do to help students effectively interact with new knowledge? 3. What will I do to help students practice and deepen their understanding of new knowledge? 4. What will I do to help students generate and test hypotheses about new knowledge? 5. What will I do to engage students? 6. What will I do to establish or maintain classroom rules and procedures? 7. What will I do to recognize and acknowledge adherence and lack of adherence to classroom rules and procedures? 8. What will I do to establish and maintain effective relationships with students? 9. What will I do to communicate high expectations for all students? 10. What will I do to develop effective lessons organized into a cohesive unit? 	learning goals, assessment, communication and interaction, instructional strategies, students, homework, learning activities, pacing, classroom management, teacher-student relationship
Stronge (2007)	Clear lesson and learning objectives Quality assignments Logically structured lessons Instructional strategies, including the use of organizers Timing learning differences Developing age and content-appropriate plans.	learning objectives, assignments, content sequence, instructional strategies, timing, learners, content
Stronge & Xu (2016)	Setting learning objectives Organizing learning activities Selecting meaningful and purposeful learning materials Using student learning data for planning, and designing the engaging opening and closing activities	learning objectives, learning activities, learning materials, assessment

Online Instructional Planning

As mentioned in the previous section, online education evolved from distance education and underwent three phases: print-based correspondence education, electronic technology-based distance education (e.g., radio and telephone facilitated audio education, television facilitated education, Computer-Assisted Instruction, and Computer-based Training two-way videoconferencing), and the Internet-based real-time transmission online education (Bourdeau & Bates, 1996). Therefore, the instruction emphases and the techniques used in three phases are different.

According to Bourdeau and Bates (1996), in the first phase, the instruction merely focuses on the content coverage. Communication is conducted mainly through the postal service. The evaluation is primarily done by a final exam. In the second phase, the focus is still on content coverage. However, communication paths have been expanded. Apart from the postal service, teachers also use telephone, audio and teleconferencing, and interactive television to communicate and interact with students. The evaluation approach is not merely limited to final exams, but also includes assignments and projects. In the third phase, teachers pay more attention to learning activities, focusing on problem-solving, decision-making, and critical thinking. Teachers and students communicate through audio and video conferencing, e-mails, computer conferencing, audio graphics, databases, and multi-media.

Online instructional planning developed in parallel with distance learning (Inglis, 1989). The planning process also shifts from merely preparing course units and supplementary materials to preparing interactive and collaborative activities, from one-way asynchronous to two-way synchronous and asynchronous communication, from delayed feedback to just-in-time feedback (Bourdeau & Bates, 1996).

Key Elements in Online Instructional Standards. Effective online teaching requires teachers to integrate pedagogy, technology, and content to provide students with quality online learning opportunities (Ferdig et al., 2009). To provide the best online teaching practice for K-12 teachers, several organizations (e.g., National Education Association, South Regional Educational Board, and Sloan-Consortium) and virtual schools (e.g., Illinois Virtual High School, Maryland Virtual School) have attempted to develop documents or standards for teachers at the beginning of the 21st century. Some well-known, commonly used, and newly updated standards include *The National Standards for Quality Online Courses* (International Association for K-12 Online Learning [iNACOL], 2011), both the *National Standards for Quality Online Teaching* and the *National Standards for Quality Online Courses* (Virtual Learning Leadership Alliance, 2019), and *Instructional Strategies for Virtual Learning Teaching and Learning Standards Rubric* (National Institute for Excellence in Teaching [NIET], 2021). The following sections are brief introductions to them.

The iNACOL is designed to provide states, districts, online programs, and other organizations with a set of quality guidelines for online teaching (International Association for K-12 Online Learning [iNACOL], 2011). The standards were developed and reviewed by a team of experts consisting of online teachers, professional developers, instructional designers, researchers, course developers, and administrators. The standards have been in use by sixteen Southern Regional Education Board (SREB) states. They prove it to be the most comprehensive among those reviewed and include guidelines set forth in the other criteria from the literature review. The standards include 11 sub-standards. Among these, instructional design is the last sub-standard, including five domains and eleven detailed standards. The five domains are instructional and audience analysis, course, unit, lesson design, instructional strategies and

activities, communication and interaction, and resources and materials. Table 2 below shows the details of the domains, specific standards, and key instructional planning elements.

The eleven standards in iNACOL include key instructional planning elements: learners' needs/characteristics, content components and sequence, teaching strategies/learning activities, communication, and interaction. There are no technology and assessment elements included in this section. However, there are two separate sections, e.g., Section C: *Student Assessment* and Section D: *Technology*. There are seven standards in three domains (evaluation strategies, feedback, and assessment resources and materials) in the *Student Assessment* section. Evaluation strategies emphasize the alignment of assessment with course goals and objectives and the fitness of evaluation approaches. The feedback domain underscores ongoing or formative assessment. The last domain emphasizes the assessment of learning materials grading rubrics, and policy. Four standards in two domains (course architecture and user interface) are included in the *Technology* section. The standards in the Technology section emphasize the learning management system, technology access, user navigation, and maximum media use.

Table 2*Overview of Section B Instructional Design in iNACOL*

Domains	Standards	Key Elements Identified
Instructional and audience analysis	1. Course design reflects a clear understanding of all students' needs and incorporates varied ways to learn and master the curriculum.	Learner analysis Course analysis
Course, unit, and lesson design	2. The course is organized by units and lessons that fall into a logical sequence. Each unit and lesson include an overview describing objectives, activities, assignments, assessments, and resources to provide multiple learning opportunities for students to master the content.	Content sequence Content components
Instructional strategies and activities	3. The course instruction includes activities that engage students in active learning. 4. The course and course instructor provide students with multiple learning paths based on student needs that engage students in a variety of ways. 5. The course provides opportunities for students to engage in higher-order thinking, critical reasoning activities, and thinking in increasingly complex ways. 6. The course provides options for the instructor to adapt learning activities to accommodate students' needs. 7. Readability levels, written language assignments, and mathematical requirements are appropriate for the course content and grade-level expectations.	Multiple learning paths Teaching strategies Learning activities Learner needs
Communication and interaction	8. The course design provides opportunities for appropriate instructor-student interaction, including opportunities for timely and frequent feedback about student progress. 9. The course design includes explicit communication/activities (both before and during the first week of the course) that confirms whether students are engaged and are progressing through the course. The instructor will follow program guidelines to address non-responsive students. 10. The course provides opportunities for appropriate instructor-student and student-student interaction to foster mastery and application of the material.	Interaction Communication
Resources and materials	11. Students have access to resources that enrich the course content.	Resources

The *National Standards for Quality Online Courses* (NSQ) (Virtual Learning Leadership Alliance, 2019) and the *National Standards for Quality Online Teaching* (NSQ) (Virtual Learning Leadership Alliance, 2019) are two of the three sets within the National Standards for Quality Online Learning; the third set is the National Standards for Quality Online Programs. The National Standards for Quality Online Learning is built on the work developed by the International Association for K-12 Online Learning (iNACOL). The NSQ for Online Teaching includes eight standard categories. Standard H is *Instructional Design*. There are six indicators with explanations and examples for each indicator in this standard. The NSQ for Online Courses consists of seven standard categories, and Standard C stands for *Instructional Design*. There are nine indicators with detailed explanations and examples of each indicator in this standard (Virtual Learning Leadership Alliance, 2019). The details of these two standards are shown in Table 3 below.

The key elements identified from NSQ Course 2019 and NSQ Teaching 2019 include content sequence and fitness, learning activities/teaching strategies, tools, and technology use, learning materials and resources, digital learning resources, communication and interaction, and assessment. In comparison with iNACOL 2011, these two documents lend more emphasis to technology use and digital resources.

Table 3*Overview of the Specific Elements of the NSQ Standards for Online Courses and Teaching*

Standards	Specific Indicators	Key Elements
NSQ Courses 2019 (Standard C)	C1 The online course design includes activities that guide learners toward promoting ownership of their learning and self-monitoring.	Learning activities
	C2 The online course's content and learning activities promote the achievement of the stated learning objectives or competencies.	Content, activities
	C3 The online course is organized by units and lessons that fall into a logical sequence.	Content sequence
	C4 The online course content is appropriate to the reading level of the intended learners.	Content fitness. Learners
	C5 The online course design includes introductory assignments or activities to engage learners within the first week of the course.	Activities & learners
	C6 The online course provides learners with multiple learning paths as appropriate, based on learner needs, that engage learners in a variety of ways.	learners/ teaching strategies
	C7 The online course provides regular opportunities for learner-learner interaction.	Interaction
	C8 The online course design provides opportunities for learner-instructor interaction, including opportunities for regular feedback about learner progress.	Interaction
	C9 Online course instructional materials and resources present content in an effective, engaging, and appropriate manner	Materials and Resources
NSQ Teaching 2019 (Standard H)	H1 The online teacher designs learning experiences that use technology to engage learners efficiently	Technology use
	H2 The online teacher uses a formative approach to lesson design.	Evaluation
	H3 The online teacher incorporates diverse media into online learning modules.	Tools, technology
	H4 The online teacher is able to incorporate subject-specific and developmentally appropriate digital learning resources into online learning modules.	Learning resources
	H5 The online teacher continuously reviews and aligns all course content with applicable course objectives and standards.	Content
	H6 The online teacher creates, selects, and organizes appropriate assignments and assessments to align curricular content with associated standards-based learning goals.	Assessment

In addition to the above documents, *Instructional Strategies for Virtual Learning: A Companion Tool to National Institute for Excellence in Teaching (NIET) Teaching and Learning Standards Rubric* is also a tool developed to describe what key instructional indicators look like and sound like when planning and delivering virtual learning (NIET, 2021). It is used alongside the *NIET K-12 Teaching and Learning Standards Rubric* to support teachers and leaders to deepen their understanding of high-quality virtual learning instruction. The tool references exemplary practice for every indicator of the NIET rubric with descriptors included. The tool consists of specific examples and strategies for how those indicators could be adapted in a virtual setting. Three domains are included in the rubric: instruction, planning, and environment. The domain of planning consists of three indicators: instructional plans, student work, and assessment. Performance descriptors explain each indicator at the exemplary level, virtual learning strategies, and additional synchronous considerations. It is more micro-level planning which includes more details. The following table shows the major idea of each column and elements identified from the descriptions.

The key elements in this rubric can be summarized as learning objective, materials, and resources, content, learning activities, teaching strategies, learner characteristics and needs, technology use, assessment approaches, and multitype of measurement. In addition, technology use is integrated into the entire instructional process. Table 4 below serves as a summary of the rubric.

Table 4*Major Points of NIET Rubric*

Indicator	Performance descriptors at the exemplary level	Virtual learning strategies	Additional synchronous considerations	Elements identified
Instructional Plan	1. Measurable and explicit objectives; 2. Activities, materials, and assessments; 3. The age, knowledge, and interests of all learners; 4. Regular opportunities to accommodate diverse student needs; and 5. Strategies for student autonomy and ownership.	1. Develop weekly plans 2. Create an online collaboration folder (e.g., Google Drive) 3. Activities and materials accommodations for diverse student needs.	Individual needs	Learners Objectives Activities Materials Assessment Strategies Technology
Student Work	1. Assignments: aligned to the standards and curriculum content, the lesson's objective, and assessment. 2. Students: learn deeply (e.g., organize, interpret, analyze, synthesize, and evaluate information); and apply what they learned to solve real-world problems.	1. Outcome-objective alignment. 2. Progress monitoring 3. Communication opportunities 4. Student's thinking of learning experience 5. Assignment evaluation	1. Pre-work is communicated and assigned. 2. Use of discussion thread.	Activities Communication Technology use Evaluation
Assessment	1. Be aligned with the state standards and content; 2. Provide feedback on progress against objectives;	1. Criteria are determined and communicated. 2. Assessment form of a project.	1. Use virtual tools to show student thinking and solutions in real time.	Technology use Content Feedback

3. Gauge student learning with various questions;	3. Progression of the individual is supported.	2. Check learners' understanding of the objectives through surveys, polls, etc.	Assessment
4. Use triangular measurement (e.g., in the form of a project, experiment, presentation, essay, short answer, or multiple-choice);		3. Provide regular virtual office hours.	Communication
5. Extend written tasks;			Learner's needs
6. Provide clear illustrations of student progress;			
7. Describe how assessment results will be used			

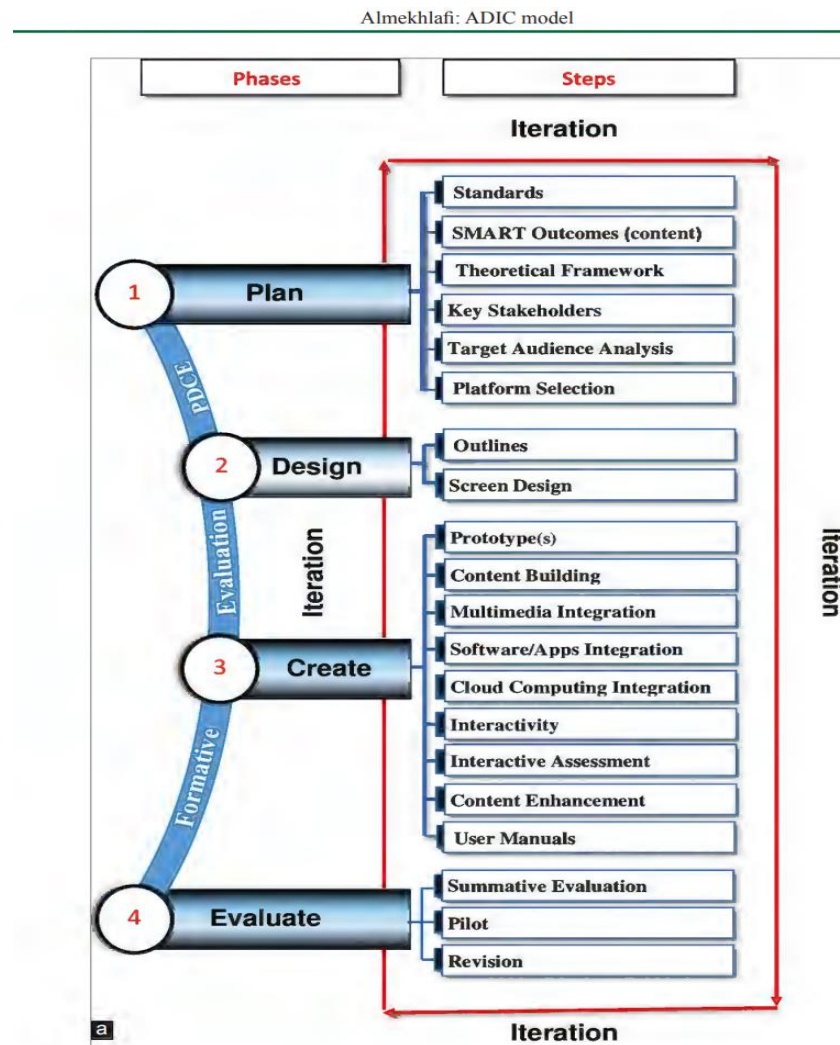
Key Elements in Online Instructional Models. Similar to face-to-face instructional design, some researchers conceptualize online instructional planning in models. The Almekhlafi Digital Interactive Content (ADIC) model and CAFE model are two examples. The ADIC, created by Almekhlafi (2020), provides guidelines for designers and curriculum developers to design interactive digital content for effective learning and teaching. The model was organized into four phases and twenty steps. The four phases include *Plan*, *Design*, *Create*, and *Evaluate*, with each phase divided into several steps. For instance, the third phase, *Create*, consists of nine steps: prototype(s), content building, multimedia integration, software/apps integration, cloud computing integration, interactivity, content enhancement, and user manuals. The entire process is iterative. Three out of nine steps emphasize technology integration. Figure 7 below shows the details of each phase.

Wang (2021) created the CAFE model for the COVID-19 pandemic to help K-12 teachers move their face-to-face instruction to online classes. CAFE is the acronym for *Content*, *Activities*, *Facilitation*, and *Evaluation*. Specifically, Wang suggests teachers put the

instructional contents together in a systematic way; design and develop a wide variety of learning activities; facilitate (1) learner-content interaction, (2) learner-instructor interaction, (3) learner-learner interaction online; and evaluate online learning performance holistically. See the details below in Figure 8. These two models share similarities in emphasizing content, learners, activities, communication and interaction, and evaluation, but the ADIC model also stresses the integration of technology in learning.

Figure 7

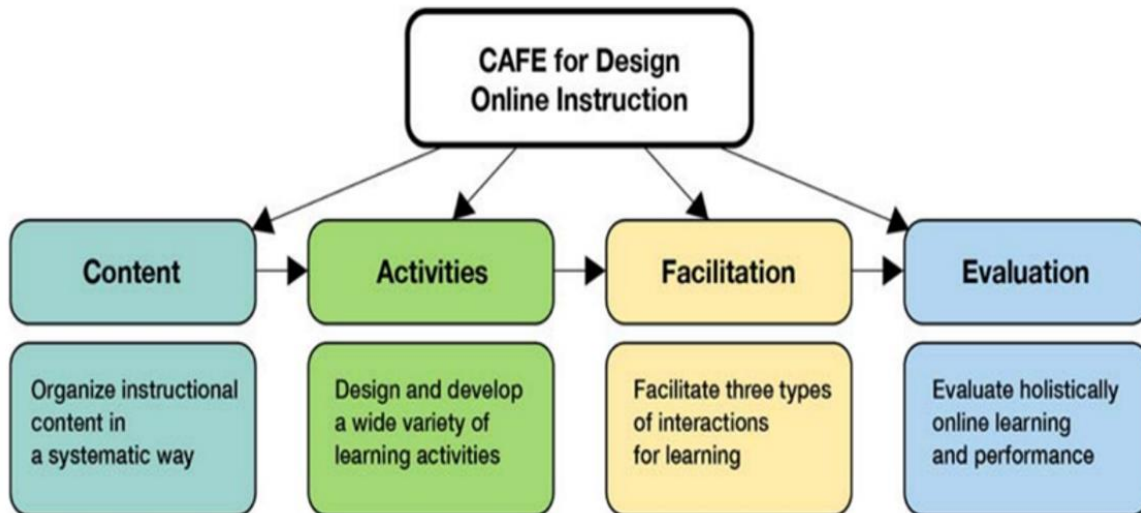
The Image of the ADIC Model



Note. Adapted from “Designing and creating digital interactive content framework: Description and evaluation of the Almekhlafi Digital Interactive Content Model” by Almekhlafi, A. G., 2020. *Science Education International*, 31(2), 130–141.

Figure 8

The Image of the CAFE Model



Note. Adapted with permission from “CAFE: An instructional design model to assist K-12 teachers in teaching remotely during and beyond the Covid-19 pandemic” by Wang, C. X., 2021. *TechTrends: Linking Research & Practice to Improve Learning*, 65(1), 8–16.

Key Elements in Online Instructional Planning Research. Researchers have conducted extensive research to study online instructional design. Though not directly described in the extant literature, the key elements in instructional planning are scattered in different studies; these elements include content, learners, learning activities or teaching strategies, learning tools and media, communication and interaction, and evaluation and assessment. Mo et al. (2021) conducted a systematic review of the online instructional planning and synthesized six key elements scattered in the research. The following sections are findings from the publications reviewed.

The first key element is learning content. Adelstein and Barbour (2016a, 2016b, 2017) searched three databases and compared all elements under the five main standards to

contemporary K-12 and higher education online course literature and found seventeen articles agreed that each unit and lesson should include an overview describing objectives, activities, assignments, and resources to provide multiple learning opportunities for students to master the content; and that the content should be aligned with the state's content standards and sufficient rigor, depth, and breadth to teach (Adelstein & Barbour, 2016a; Adelstein & Barbour, 2016b; Adelstein & Barbour, 2017).

The type and the amount of the content are also important. Barbour and Adelstein's (2013) interviewed six students from four different schools, half of the results were related to content. Students reported that one of the barriers preventing them from using the asynchronous web-based content was the type and amount of work assigned by teachers during the offline time. The selection of learning materials and resources is another part of content design. Gyabak (2015) interviewed 11 teachers and found that all eleven teachers reported they select content carefully because resources and instructional materials in Google were not always appropriate, and so did the face-to-face teaching materials. They took out elements that did not fit the online environment from face-to-face materials.

Additionally, content is a significant element in instructional design models. For example, Wang (2021) designed the CAFE (Content, Activities, Facilitation, Evaluation) model and put *Content* as the first domain of the model, stating that organizing the instructional content needs to be systematic. The content should be classified into four levels: course content, module content, lesson content, and activity content. This classification shows that the type, amount, and sequence of the content are essential issues to consider in instructional planning. Similarly, in the Almekhlafi ADIC model, content building and content enhancement were important elements in the *Create* phase.

Learners are also emphasized in literature. Researchers believe that a good understanding of the learners is conducive to gaining student attention and adding relevance to the instruction (Carnahan & Mensch, 2014). Learner analysis is crucial for regular students and students with disabilities. In their conceptual article, Huett et al. (2008) claimed that a distance environment needed to be carefully designed to accommodate diverse learners because some students tended to thrive in the virtual environment. However, some may be unable or unwilling to learn. And some may be constrained by their physical or personal characteristics. In their conceptual study, Carnahan and Fulton (2013) also argued that understanding the characteristics of special education students was fundamental for instructional design and educational practice to serve the needs of diverse learners in online programs.

Knowing learners' characteristics, including their demographics, prior knowledge, and physiological, affective, and social needs, can shape the design decisions and influence teachers' instructional methods and strategies. For example, Kranch (2008) created the Iterative Individual Instructional Development Model (I3DM). The first step of applying the content phase was learner analysis, including analyzing the learners' entry knowledge and behaviors, characteristics, expectations, and learning context. Likewise, in an empirical study, Almekhlafi (2020) created an instructional planning model and tested 81 pre-service teachers in two designing projects. The results showed the participants implemented the model items in two projects at a rate of 92% and 74%, respectively. All these studies indicate that analyzing the learner's characteristics, such as demographic information, prior knowledge, and anxiety level, benefits from equal opportunity, cultural diversity, and accessibility, is essential to online instruction.

Learning tools and media are essential elements in promoting student learning. Some researchers have studied the importance of learning tools and media. For example, Adelstein and Barbour (2016a) examined the validity and reliability of iNACOL with educators and designers and found that educators use appropriate media, simulations, and games to engage students. The empirical study conducted by Barbour and Adelstein (2013) also showed that multimedia could promote student engagement, a point supported by another conceptual study, which found instruction without multimedia to be bland and insipid, ineffectual in sustaining student interest (Huett et al., 2008). In Almekhlafi's (2020) planning model, multimedia integration, software/App integration, and cloud computing were emphasized. Hofer and Harris (2019) conducted a university-sponsored professional learning program for eight K-12 classroom teachers to help them explore ways to plan technology-enhanced, curriculum standards-specific lessons, units, and projects. They found that participants increase their emphasis on technology use in their planning after being introduced to content-specific planning aids.

Besides the importance of technology use, some researchers studied teachers' implementation of tools and students' perceptions about the tools teachers used. For example, Gyabak et al. (2015) interviewed eleven teachers about their instructional design process and revealed that eight teachers used several technological tools in designing online instruction, such as Blabberize, ExploreLearning, Google Docs, Google Forms, Google Sites, Google Presenter, VoiceThread, Symbaloo, YouTube Videos, Glogster, LiveBinders, SpringPad, Camtasia, Videolicious, Edudemic, Picmonkey, and TED videos. This finding is echoed in Arslan's (2020) systematic review of 78 articles. The review showed that teachers benefit from software such as PowerPoint, Camtasia, Snagit, Tellagami, Pow Toon, and Adobe Presenter. The review also showed that the Learning Management System (LMS) was a critical platform because teachers

could upload course content such as YouTube clips, the syllabus, and assignment guides to preview asynchronously. Apart from teachers, in a survey students reported “emails” and “virtual classrooms” as two useful tools for them (Barbour, 2008)

Activity design relates to the approaches or strategies through which students conduct learning. The activity design matters because effective activities contribute to the success of learning. Reversely, ineffective activity hinders students’ learning. The importance of learning activities and teaching strategies is stressed in the literature. For instance, Adelstein and Barbour (2017) invited eight experts to review the rubric of iNOCAL; the average score of the five elements under the “instructional strategies and activities” was the highest domain compared with others. Some researchers provided specific recommendations for designing activities. For instance, when creating the CAFE instructional planning model, Wang (2021) suggested that teachers design different activities based on the content and learners’ characteristics. Some researchers provided overarching considerations for the activity design. For example, Arslan's (2020) systematic review included activity design considerations: dividing activities into hands-on activities and activities for higher order thinking skills.

Communication and interaction are some of the most significant factors for successful online learning (Bolliger, 2004). Adelstein and Barbour (2016) studied the validity and reliability of iNACOL standards and concluded that communication was the key to a successful online course. Besides, several researchers included the element of "interaction" in the instructional models they created. For instance, in creating an online instructional model, Almekhlafi (2020) emphasized the significance of interaction in attracting and engaging students. The interaction in ADIC model involved student-student interaction, student-instructor interaction, student-interface interaction, and student-content interaction. Wang (2021) echoed this point in the

CAFE model, emphasizing learner-content interaction, learner-instructor interaction, and learner-learner interaction. In addition, some researchers introduced some specific communication and interaction tools. For instance, in their conceptual study Brunvand and Byrd (2011) claimed that “VoiceThread is one of many Web 2.0 tools created to help users communicate and collaborate around a variety of topics” (p.30). Di Paola et al. (2017) also found that video enabled students to hear the instructor’s voice, both written words and video recordings, contributing to community-building among like-minded people within an online course. Communication and interaction could bring about ease of understanding and better comprehension among students.

Assessment and evaluation are also significant elements researchers valorize. For instance, in the systematic review, Arslan (2020) indicated that formative assessment instruments, taxonomy-based questions, quizzes as an incentive, and the use of an LMS for quizzes were significant assessment tools for flipped classes. Teachers could use formative assessment instruments to fine-tune assessments to the course goals, use Bloom’s Taxonomy to design questions with lower-order and higher-order thinking, use quizzes to motivate students to learn prior to class, and use an LMS to assess students’ learning process. In the CAFE model, Wang (2021) recommended using multiple data sources to evaluate student learning holistically. The multiple sources of data included individual students’, peers’, and parents’ assessments. Self-assessment was also recommended. Barbour and Adelstein (2013) investigated students’ perceptions of web-based learning, and students commented that the “*Test Yourself*” (self-assessment section) in each module was helpful. In their validation research, Adelstein and Barbour (2016) revealed that educators could use timely feedback and evaluation rubrics to evaluate students’ learning. To conclude, assessment and evaluation of online instruction are widely studied from different perspectives.

Summary

Instructional planning is an essential part of effective instruction for both face-to-face and online instruction. It prescribes what to teach, how to teach, and how to evaluate the outcomes of teaching. There are many teaching standards, frameworks, and instructional planning models to guide teachers' planning practice. Even though the planning elements included in each standard, model, and effective teaching framework are slightly different, the key elements are similar. Whether in face-to-face or online instruction, learners, content, learning activities, teaching strategies, communication and interaction, and assessment and evaluation are all key components. Notably, technology use or integration and communication and interaction are emphasized in the online instructional planning literature. This is not surprising because the online instruction modality requires teachers to make full use of technology to facilitate and enhance teaching. However, teachers' priorities and frequencies of using these elements in their planning practice are unknown.

There is no one-size-fits-all model for what elements should be included in instructional planning. Instead, the elements included in the planning are influenced by many factors, such as the teacher, the context and learning theories. The teacher factor, school levels, and years of online teaching experiences may affect a teacher's planning decisions. Therefore, investigating Mid-Atlantic State Virtual Program teachers' priorities of the key planning elements, the frequencies with which they use the key elements and the beliefs behind using them in their planning practice is meaningfully relevant and important.

CHAPTER 3

METHOD

This chapter presents the overall design of this study, addressing the research paradigm, research strategy, sampling method, data generation and collection, data analysis, assumptions, limitations, and delimitations. The primary questions guiding this research were:

RQ1: How do elementary, middle, and high school teachers from Mid-Atlantic State Virtual

Program (MASVP) prioritize the importance of the six identified elements in planning for online instruction?

RQ2: Is there any significant difference in elementary, middle and high school teachers'

prioritization of the six identified elements in planning for online instruction based on prior online teaching experience?

RQ3: How frequently do elementary, middle, and high school teachers from MASVP use the six identified elements in planning for online instruction?

RQ4: Is there any significant difference in the frequencies with which elementary, middle, and high school teachers use the six identified elements in planning for online instruction based on prior online teaching experience?

RQ5. What are the beliefs implicit in practices of teachers from MASVP in planning for instruction online?

This study has been premised on pragmatism, employing a mixed method to address these questions; its purpose is to explore online teachers' instructional planning, specifically the planning and prioritization of elements, frequency of using the elements, as well as their beliefs

and practices in using these elements. The data sources include surveys and semi-structured interviews. The data were analyzed through both quantitative and qualitative approaches. The following sections expand on the details of the research design.

Research Paradigm

Paradigms are belief systems or world views that guide research and practice (Willis, 2007). Pragmatism is a research paradigm that believes in adopting a methodological approach that works best for the particular research problem under investigation. Reality is embedded situationally, in need of human experience (Creswell et al., 2011; Goles & Hirschheim, 2000; Morgan, 2014; Tashakkori & Teddlie, 1998). This means that reality or knowledge thereof is socially constructed experientially, rather than something existing objectively to be discovered. Knowledge varies from person to person because people's experiences are different even in the same situation (Morgan, 2014; Yefimov, 2004). Pragmatists believe that knowledge is always contingent on experience (Kaushik & Walsh, 2019) and constructed to manage one's existence better and take part in the world (Goldkuhl, 2012).

As a research paradigm, pragmatism tends to solve practical problems in the real world (Creswell et al., 2011; Maxcy, 2003) and achieve its purpose (Hothersall, 2019). It is not simply "if it works, then it's true" (Boisvert, 1998, p. 31), but rather whatever proves itself good or useful over time is true (Baker & Schaltegger, 2015). Thus, unlike positivistic researchers using empirical evidence and hypothesis testing to obtain objective knowledge or reality, or constructivists developing subjective meaning based on participants' views, pragmatic researchers embrace whatever best addresses research questions and the research focus. For pragmatic researchers, the process of acquiring knowledge is neither objective nor subjective. It is situated somewhere in between objective and subjective (Goles & Hirschheim, 2000).

Pragmatic researchers argue that truth cannot be determined once and for all by either-or views on positivism and constructivism (Subedi, 2016). Rather it should take a pluralist position from different paradigms to advance knowledge (Maxcy, 2003).

In terms of research design, positivism typically supports quantitative methods and deductive reasoning, constructivism emphasizes qualitative approaches and inductive reasoning, whereas pragmatism embraces the two and offers a flexible and more reflexive approach to research design (Yvonne Feilzer, 2010; Morgan, 2007). The pragmatist researcher selects the most appropriate research design and methodology to address research questions (Kaushik & Walsh, 2019). Typically, pragmatists use abductive reasoning that moves back and forth between deduction and induction so that the researcher is actively involved in creating data and theories simultaneously (Goldkuhl, 2012; Morgan, 2007). Through abduction, the researcher can uncover and rely on the best explanations to understand the results (de Waal, 2001). Pragmatist researchers conclude their research by careful consideration of involvement of human experience and the context because they believe that meaning is constructed experientially and contextually (Dillon et al., 2000).

The focus of this study is to explore participants' priorities for instructional planning elements, their frequency in using the identified elements, and their overall beliefs and practices in online instructional planning. A single objective or subjective lens was not adequate to address this focus. A better understanding of this focus needed a combination of both objective and subjective perspectives. The research questions in this study involved both quantitative and qualitative methods. Specifically, the first four questions were answered through quantitative method. And the fifth question was addressed through qualitative method. Therefore, a mixed-methods approach was the best to help address the research questions. For the data analysis, this

study used quantitative statistics analysis and qualitative thematic analysis to better explain the participants' lived experiences. In short, from the research focus to research design, pragmatism is the best fit to address the research questions. The next section provides a detailed description of the research design.

Research Perspective

This study builds on the six identified elements of online instructional planning, which is summarized by Mo et al. (2021) in a systematic literature review of online planning elements. Mo et al. (2021) reviewed 21 studies and identified six key elements most commonly used in online instructional planning: content design, learner analysis, learning activity and/or teaching strategy, learning tools and media, communication and/or interaction, and assessment and/or evaluation. The main points of this matrix of six elements are:

- *Content design* includes setting instructional objectives, selecting learning materials and resources, chunking, and sequencing the learning content based on a good understanding of the subject matter and the learner; specific online materials distributed to students through electronic channels and website content accessible to learners via website platforms.
- *Learner analysis* includes the analysis of students' cognitive level, personalities, learning preferences, students' technology accessibility, and digital literacy.
- *Learning activities and/or teaching strategies* include tutorials (self-paced learning); web conferences (synchronous meetings in a virtual environment); online forums (bulletin boards, discussion groups, or news groups); virtual collaborative workspaces; simulations; goal-based scenarios and active learning through lecture video presentations;

recent new articles and videos; guest speakers' synchronous chat, authentic projects, and problem-solving situations.

- *Learning tools and media* include multimedia, software/apps, cloud computing, and LMS, such as Moodle, Blackboard, Google Docs, VoiceThread, TED Videos, YouTube Videos, PowerPoint, Camtasia, Snagit, Tellagami, Pow Toon, Adobe Presenter, etc.
- *Communication and/or interaction* refers to communication in an online setting that can be asynchronous written communication (such as independent study or online learning) or synchronous audiovisual communication (such as videoconferencing). Interactions can be learner-instructor interaction, learner-content interaction, learner-learner interactions, and learner-interface interaction.
- *Assessment and/or evaluation* can be summative assessment including individual works, group works, tests, paper, oral or written tests conducted in the instructor's presence through videoconferencing. It can also be formative assessment done by integrating cognitive assessment, performance assessment, and portfolio assessment into online learning settings.

These six elements form the framework for data generation, data analysis, and discussion sections in the study. The survey instrument and interview questions were created based on these six elements in the data generation phase. In the data analysis phase, these six elements served as guides to creating *a priori* codes. Finally, these six elements are the foundation for the discussion section.

Study Methodology

This study utilizes a mixed-methods design, an explanatory sequential mixed methods that include quantitative and qualitative research. Mixed-methods research is formally defined as

“the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study” (Johnson & Onwuegbuzie, 2004, p. 17). The explanatory sequential mixed method is “one method in which the researcher first conducts quantitative research, analyzes the results, and then builds on the results to explain them in more detail with qualitative research” (Creswell, 2014, p. 53). The combination of quantitative and qualitative research approaches could give the researcher a broader and deeper understanding of the research focus (Johnson et al., 2019). In addition, mixed-methods research can provide better inferences and minimize unimethod bias (Teddlie & Tashakkori, 2003). Many mixed methodologists claim that the mixed methods approach is the best research paradigm for several reasons. First, it gives a paradigm that philosophically embraces the use of mixed model designs. Second, it avoids using disputable concepts. Finally, it presents a practical and applied research philosophy (Bryman, 2012; Flick, 2006; Niglas, 2004; Ritchie & Lewis, 2013; Teddlie & Tashakkari, 2009).

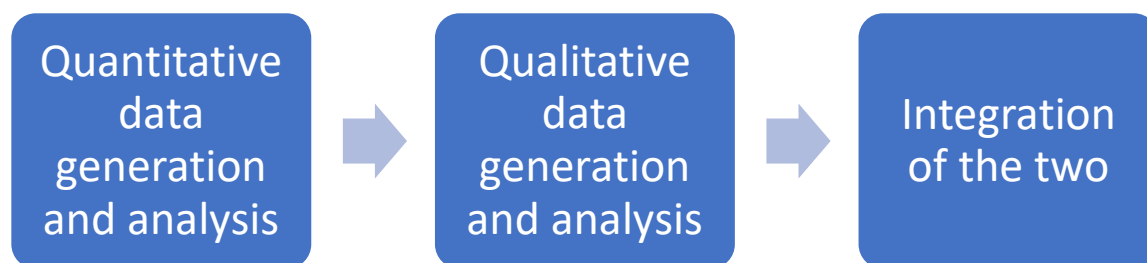
Data from mixed methods are usually generated and analyzed in different ways in different mixed methods designs. In the explanatory sequential design, quantitative data are collected and analyzed first, followed by qualitative data generation and analysis (Creswell et al., 2011). The rationale for this sequence is that the quantitative data and results provide a general picture of the research problem; deeper analysis through qualitative data collection is used to refine, extend, or explain the general picture. In this study, initially, teachers responded to a survey to obtain a general picture of how they prioritize the identified elements, how frequently they use these elements, and whether there are significant differences among teachers in different school levels regarding priority and frequency. After getting this general picture, qualitative data were generated through interviews to help refine, extend, and explain teachers’ beliefs and

practices of using those elements in their planning. Finally, quantitative and qualitative findings were integrated to make sense of the data. Figure 9 below shows the sequence of data generation and data analysis.

The mixed methods were interwoven in data generation, data analysis, and the findings sections. Specifically, data were collected through survey and interviews, and then both quantitative statistics analysis and qualitative thematic analysis were used to explore teachers' priorities, frequencies, and beliefs and practice of using the six elements in planning. Finally, thorough and comprehensive findings were developed by integrating both quantitative and qualitative data analysis findings. Such an approach could support each method and minimize the bias that any of them would bring to the study. Thus, the combination of quantitative and qualitative methods is the best fit to address the research focus, research questions, and findings of this study.

Figure 9

The Sequence of Data Generation and Data Analysis



Participants

Participants in this study are teachers from Mid-Atlantic State Virtual Program (MASVP), a pseudonym of the real school. MASVP is a program of the Mid-Atlantic State Department of Education serving students in Mid-Atlantic schools by providing flexible options for the diverse educational needs of students and their families. MASVP offers both K-5 Elementary Program and Secondary Programs. All students enrolled in the MASVP remain affiliated with the enrolling school and the school division. MASVP K-5 Elementary Program offers divisions, schools, and learners the option of high-quality, full-time virtual instruction. The Secondary Program offers more than 100 online courses taught by state-certified teachers for middle school and high school learners (grades 6-12). Instruction incorporates daily synchronous opportunities and asynchronous learning experiences. Part-time and full-time enrollment is available.

MASVP teachers are full-time, professional online teachers. According to the MASVP job description, teachers who work in MASVP are expected to hold a Mid-Atlantic State Teacher's License, have experience in lesson planning and curriculum development, have expertise in using technology in education, be familiar with Learning Management Systems (LMS) and online/blended course work, and can utilize web-conferencing software to deliver daily live instruction. More importantly, after recruiting teachers, MASVP offers them many professional learning opportunities. The major ones include a three-week induction course, virtual EdCamp, monthly professional learning, and professional learning community. The three-week induction course is designed for all teachers new to MASVP, led by MASVP facilitators who provide feedback on required course assignments. Course content covers online methodology, the National Standards for Quality Online Learning (Teaching and Course

Standards), student engagement, course design, LMS training. Virtual EdCamp is an annual online six-day training conference for all teachers. Sessions include some choice for teachers according to skill level and interest. In addition, teachers participate in monthly professional learning aligned to the NSQ. Topics vary each month. MASVP teachers participate in professional learning communities (PLCs), meeting monthly to work towards group-developed goals.

In total, there are 144 teachers in MASVP. Among which, 29 are from elementary school, 34 from middle school, 57 from high school, and 24 teach both middle school and high school. The survey questionnaire was sent to all 144 teachers. The interview participants were recruited from survey respondents based on their voluntary options. Specifically, at the end of the survey instrument, volunteer participants were requested to join the interviews and then invited to check the options provided. The participants who checked “Yes,” were broken into three subgroups based on their school levels and used stratified random sampling to select participants from each of the three groups of volunteers: elementary, middle, and high schools. The volunteers were divided into various sub-groups sharing common characteristics in stratified random sampling. Then, a random sample was taken from each subgroup (Acharya et al., 2013). The goal was to recruit 15 participants, including three from elementary schools, five from middle schools, four from high schools, and three who have overlapped courses for both middle school and high school to participate in the interview.

Data Generation

As mentioned in the previous section, the data were generated through surveys and interviews. These two types of data make the data source supplementary. The details of each type of data generation are described as follows.

Teacher Survey

The survey was conducted through Qualtrics, a web-based survey tool. After the creating and revision of the survey instrument based on experts' feedback, it was formulated in Qualtrics. The participants were recruited through a director of MASVP (personal communication). Specifically, at the end of September, the first email (See Appendix A) was sent to the teachers to inform teachers that the survey was coming the next week. The second email was sent to them on October 5 with the survey link. In mid-October, a follow-up was sent to those who have not responded. And at the beginning of November, another reminder was sent to those who had not responded yet to remind them to complete the survey. The survey closed on November 15 and data collected after that day.

Instrumentation. An instrument is a tool for measuring, observing, or documenting quantitative data that contains specific questions and response possibilities researchers developed ahead of time (Creswell, 2014). Survey instruments serve as approaches to collect data for a special purpose and provide the information needed (Fowler, 2014). The survey instrument (see Appendix B) used in this study was developed based on the six elements for online instructional planning identified by Mo et al. (2021) in their systematic literature review.

This instrument was validated before it was used in the study. The validity and reliability of the survey instrument are crucial to the survey results. Researchers can use these four steps to evaluate the survey questions and the instrument: (1) critical systematic review (to identify the question that needs a revision using a list of look-fors); (2) cognitive laboratory interviews (to find out if they are questions people can consistently understand and answer); (3) design, format, and layout of survey instruments (to make design, layout, and format of the tasks easy for

respondents); and (4) field pretests (to find out how the survey instrument work under realistic conditions) (Fowler, 2014).

Guided by this process, after the initial design, the questions were sent to two university professors (e.g., professors from my dissertation committee) for revisions and to check the consistency of understanding, including wording, structure, and readability. Then, the revised survey instrument was sent to experts for feedback. Finally, after all the revisions, the questions were sent to two practitioners to do the pretest to determine how the survey instrument worked. When all the four steps were done, the survey questions were formatted into Qualtrics and prepared to launch.

The dissertation committee's feedback on the survey instrument were as follows:

1. Prior to each question in Part II of the survey, provide a short description of each planning element so that the teachers understand what is meant by the element when they are responding.
2. Switch the order of original Part III and Part IV so that teachers are rank ordering after responding about how important the elements are.
3. Change the responses to the questions regarding frequency of use.
4. Add open-ended questions to provide teachers with the opportunity to indicate whether there are other elements they address in planning for online instruction that are not reflected in the six elements addressed in the survey and to provide them with the opportunity to discuss any challenges related to planning for online instruction.

Acting on the above feedback, definition of each element was added and the responses to the questions regarding frequency of use were changed. For instance, the original Question 1 "How important is Content Design in your planning?" was revised as "Content Design in this

study is defined to include, but not limited to, the following steps: setting instructional objectives, selecting learning materials and resources, chunking the teaching plan or curriculum, and sequencing the learning content. How important is including these content design steps in your instructional planning?” The choices of each question were also revised from “0 Not at all important, 1 somewhat important, 2 important, and 3 very important” to “1 2 3 4 5” “Not at all important to extremely important.”

Feedback from experts was to make sure there was a complete consent form in the survey questionnaire. Acting on this feedback, the consent form was moved to the beginning of the questionnaire. Practitioners’ pretest went well, there was nothing to revise or edit.

Teacher Interviews

The interviews in this study are semi-structured interviews used to prompt participants to articulate their understanding of online instructional planning, ultimately answering research question 5. Semi-structured interviews involve using a set of pre-determined questions and follow-up questions to encourage respondents’ deeper thinking on ideas and issues that emerge during the interview (Kvale, 1999). Conducting semi-structured interviews helps ensure the conversations cover key areas of the research focus and generate follow-up questions based on participants’ responses.

The semi-structured interview questions of this study were generated on the basis of the six identified elements in the systematic literature review of Mo et al. (2021). The interview questions and sample follow-up probes in Appendix C were used to prompt participants’ reflections on their beliefs and practices in planning and recommendations for improving online instruction; in particular, they were used to address research question 5. Like the survey instrument, the interview protocol was reviewed by experts. Their feedback indicated that the

third question was not necessary since the teachers did not need to design a curriculum. Based on the feedback, the third question was removed from the original protocol.

The interviewees were recruited from the survey. After their agreement of participating in the interview was collected, participants were sent a formal consent form (See Appendix D) to sign. There were 15 interviews in total. Each interview lasted between 45-60 minutes, depending on the length of participants' responses. Each participant was interviewed through zoom video conferencing based on the predetermined questions. Follow-up questions were asked when necessary. There were nine interview questions. Three of them were general questions about teachers' planning practice. The other six questions were aligned with the five elements identified (content design was removed based on the expert's feedback). Table 5 below shows the six elements and their corresponding interview questions. Member checking, a way to validate data by checking my understanding of participants (Saldana, 2016), was used to ensure clarification of the participant's statements. All the data were member-checked for two rounds, both during the interview and after cleaning the transcripts. Finally, all the interviews were recorded in the data generation process and transcribed verbatim in the data analysis phase.

Table 5*The Six Elements and the Corresponding Interview Questions*

Elements	Interview questions
Learner analysis	<p>How do you go about understanding your students' needs in order to plan for online instruction?</p> <ul style="list-style-type: none"> • How do you use this information in the planning process? • How is this process different from and similar to from face-to-face learning content?
Learning activities and/or teaching strategies	<p>What learning activities or teaching strategies do you most rely on to engage students in an online environment?</p> <ul style="list-style-type: none"> • What impacts your decisions in selecting learning activities or teaching strategies? • How is this process different from and similar to from face-to-face learning content?
Learning tools/media	<p>What learning tools or media do you most rely on to engage students in the online environment?</p> <ul style="list-style-type: none"> • What impacts your decisions in selecting learning activities or teaching strategies? • How is this process different from and similar to from face-to-face learning content? <p>How do you integrate digital technology into your pedagogy?</p> <ul style="list-style-type: none"> • What is the role of digital technology in your online teaching? • Could you describe an example in which you integrated digital technology into your pedagogy successfully?
Communication and/or interaction	<p>What approaches and tools do you most rely on to facilitate communication and interaction in the online environment? This communication and interaction may include teacher to student, student to teacher, and student to student.</p> <p>How important are communication and interaction in online instruction?</p> <ul style="list-style-type: none"> • What impacts your decisions in selecting approaches and tools to facilitate communication and interactions in the online environment? • How is this process different from and similar to from face-to-face learning content?
Assessment and/or evaluation	<p>What tools or techniques do you use to assess students' learning outcomes in online learning?</p> <ul style="list-style-type: none"> • What tools or techniques do you use on a daily basis? At the end of an instructional unit? • How do you use assessment data to help you with your instruction planning? • What impacts your decisions in selecting the tools or techniques for assessing student learning? <p>How is this process different from and similar to from face-to-face learning content?</p>

Data Analysis

Data analysis is a process of moving the raw data to interpretations and general explanations (Xu, 2011). The data in this study came from two different data sources, and they were analyzed with different approaches; table 6 below shows the details.

Table 6

Data Analysis Approaches

Research Questions	Data Analysis Approaches
RQ1: How do elementary, middle, and high school teachers from MASVP prioritize the importance of six identified elements in planning for online instruction?	Descriptive statistics: Mean scores, frequencies, rank-ordering
RQ2: Is there a significant difference in elementary, middle, and high school teachers' prioritization of the six identified elements in planning for instruction online based on teacher's years of online teaching experience?	Descriptive statistics: Univariate ANOVA
RQ3: How frequently do elementary, middle, and high school teachers from MASVP use six identified elements in planning for online instruction?	Descriptive statistics: Mean scores, frequencies
RQ4: Is there any significant difference in the frequencies with which elementary, middle, and high school teachers use the six identified elements in planning for instruction online based on teacher's gender and online teaching experience?	Descriptive statistics: Univariate ANOVA
RQ5. What are the beliefs and practices of teachers from MASVP in planning for instruction online?	Thematic analysis

Survey Data Analysis

Descriptive statistics were analyzed to answer most survey questions. Descriptive statistics are mathematical techniques used to organize, summarize, and display numerical data (Gall et al., 2007). In this study, descriptive statistics include means, frequencies, order-ranking, and inferential statistical analysis. Means were calculated to compare the average numbers of the six elements used by the participants. Frequencies were calculated to examine how often participants used each of the six elements in their lesson planning. Rank-ordering was used to address participants' priorities in using the six identified elements. Rank ordering was used in this study for three reasons: first, it forced participants to compare the importance of elements against one another; second, it increased the variation of responses when participants made choices; third, it was more valid and reliable than using ratings (Guskey, 2007). Univariate ANOVA was calculated to determine if statistically significant differences ($p < .05$) existed among different teacher groups, such as elementary, middle, and high school levels, and teachers with different years of online teaching. The statistics showed that overall, significant differences existed among teachers at different school levels. Therefore, pair comparison was run to examine where the significant differences were. All the quantitative analysis was done through IBM Statistic Package for Social Science (SPSS) 28.0.0.0.

Interview Data Analysis

The data generated from the interviews were recorded, transcribed verbatim, and analyzed using thematic analysis. Thematic analysis is a data analysis method in which researchers identify common themes, patterns, ideas, and topics across the data set (Braun & Clarke, 2012). The purpose of thematic analysis is to identify and make sense of commonalities of the data. The software used to assist the analysis was Dedoose, a computer-assisted qualitative

data management software (Talanquer, 2014). This software has several advantages. For instance, it provides dynamic and simultaneous access to different components of the data analysis, including excerpts, codes, annotations, and demographic data. It also provides various functions which can direct me to the themes and relationships emerging from the analysis and across the data sets (Dedoose, n.d.). The process of thematic analysis was guided by Braun and Clarke's (2006) six steps to map out the main themes, subthemes, and the interconnections between main themes and subthemes. The six phases of thematic analysis are: familiarizing yourself with the data, generating initial codes, searching for themes, reviewing potential themes, defining and naming themes, and producing the report.

Familiarizing Yourself with the Data. After the interview data generation, the interview transcripts were vetted, and then read and reread to make notes or highlight things relevant to the research questions. This increased familiarity with the data content and so it could be used as memory aids and triggers for coding and analysis (Braun & Clarke, 2006). Upon completion of reading and rereading each transcript, they were uploaded to Dedoose,

Creating Initial Codes. After uploading the transcripts to Dedoose, initial codes or *a priori* codes were created based on the six elements identified by Mo et al. (2021). *A priori* codes are predetermined codes derived from a previous coding dictionary or from another researchers (Stuckey, 2015). Table 7 below shows an overview of *a priori* codes and their related meaning in this study. These *a priori* codes were initial codes guiding the direction of the analysis. In the process of analyzing, more emergent codes were added to the code list; the data was coded by small chunks (e.g., each interview question). The potential and relevant information was coded. When information was confusing, it was coded with a memo in Dedoose to review the

information later. The process of coding ended when all the data were fully coded and the data relevant to each code has been collated (Braun & Clarke, 2006).

Searching for Themes. In this phase, codes were shifted to themes, which involves collapsing or clustering codes through reviewing the coded data to identify the similarities and overlaps. The themes generated were something important to research questions and represented “some level of patterned response or meaning within the data set” (Braun & Clarke, 2006, p. 82). Dedoose helped create a visual representation of the clustered and co-occurrent codes. Themes then were generated based on the clusters, overlaps and cooccurrence.

Reviewing Potential Themes. This phase was devoted to checking the quality of the themes generated. Two steps were used to guide the review (Braun & Clarke, 2006). First, the themes were examined to see if they are well related to the data. If a theme was well related, then it was a good theme; if it was not, it would be discarded or relocated to a different theme. Second, the themes were reread and reviewed to check their relations with the entire data set’s relevant elements, the overall tone, and the relation to the research questions. If the themes made sense in the entire data set, they were in good quality. If not, it would be refined and reviewed. This step involved creating additional themes or tweaking or discarding existing themes.

Table 7*A Priori Codes*

<i>A priori</i> codes	Related content
Content Design	Objectives, learning materials, and resources, chunking and sequencing the content, pacing etc.
Learners Analysis	Students' cognitive level, personalities, learning preferences, students' technology accessibility, and digital literacy.
Learning Activities and/or Teaching Strategies	Web Conferences; Online Forums; Virtual Collaborative Workspaces; Simulations; Goal-based Scenarios and active learning lecture video presentations; guest speakers' synchronous chat, authentic projects, problem-solving situations, etc.
Learning Tools and Media	Multimedia, software/Apps, cloud computing, LMS, etc.
Communication and/or Interaction	Asynchronous written communication and synchronous audiovisual Communication, learner-instructor interaction, learner-content interaction, learner-learner interactions, learner-interface interaction
Assessment and/or Evaluation	Individual works, group works, tests, paper, oral or written tests conducted in the instructor's presence through videoconferencing.

Defining and Naming Themes. In this phase, themes were defined and named by identifying the uniqueness and essence of the themes. Each theme focuses on only one single

focus. All the themes were related but not overlapped to address the research questions (Braun & Clarke, 2006).

Producing the Report. The report does not mean to repeat or paraphrase the themes, rather it requires the researcher to go beyond the themes and present a compelling story about the data based on the analysis. The combination of good themes can make more sense of the story (Braun & Clarke, 2006). Hence, in this phase, themes were organized and reported in a logical and relevant order.

Integration of the Data

Following the statistical analysis of the survey data and thematic analysis of the interview data, the findings were integrated, which did not mean simply putting multiple data analysis results together separately. Rather, it was combined and intertwined to reach a common research goal.

Quality Criteria

Quality criteria for mixed methods research are still debated in academia (O’Cathain, 2010). Teddlie and Teshakkori (2003) propose a model of assessing the quality of mixed methods research and introduced the concept of inference quality, in which the methodological rigor and authenticity of conclusions from the study are assessed. However, other researchers disagree with this model arguing that this concept focuses on the inference quality of outcome of the research rather than inference quality of the process. The inference quality of how the inferences were drawn and the inferences themselves is also essential (Onwuegbuzie & Combs, 2010). To provide a more comprehensive framework, O’Cathain (2010) proposes *Quality Framework for Mixed Methods Research* which includes eight domains of quality in five stages. The five stages comprise planning, undertaking, interpreting, disseminating, and application in

the real world. The eight domains of quality are planning quality, design quality, data quality, interpretive rigor, inference transferability, reporting quality, synthesizability, and utility quality. This study employs this framework to guide the inference qualities of the process and the outcome.

Planning Quality. In the planning stage, the researcher needs to meet the criteria of foundational element, rationale transparency, planning transparency and feasibility (O’Cathain, 2010). This study uses a comprehensible and critical review of literature to shape the research questions and the research method. The rationale for studying online teacher’s planning is articulated in the first chapter. The research paradigm, the fitness of pragmatism to this research, data generation, and data analysis are all detailed in this chapter. All these descriptions help this research meet the planning quality.

Design Quality. Design quality can be manifested through design transparency, design suitability, design strength, and design rigor (O’Cathain, 2010). This study articulates the strength and fitness of the explanatory sequential mixed methods, its relations with the research paradigm, research questions, and research method. The research perspective was also described in detail and connected to the data generation and data analysis process. Each step is transparent.

Data Quality. The data quality can be met through data transparency, data rigor/design fidelity, sampling adequacy, and analytic integration rigor (O’Cathain, 2010). Data generation processes are explicitly described in this chapter and next chapter. As stated above, two types of data were generated, including data from a survey and data from individual interviews. Thus, the survey findings foster understanding of what occurs in teachers’ instructional planning practice first; then, individual interviews explain the findings in the survey. For data rigor or design fidelity, the dissertation committee’s and William & Mary Education Institutional Review

Committee's (EDIRC) rigor requirements were followed to maintain fidelity. The survey instrument and interview protocol were validated by experts and practitioners.

Interpreting Quality. The findings emerged from both the survey and the interview data. Inferences were consistent with current knowledge and the findings they based on; the conclusion was drawn from the findings presented, including other researchers and study participants (Teddlie & Tashakkori, 2009).

Inference Transferability. Four types of transferability were proposed: ecological (transferability to other contexts and settings), population (transferability to other groups and individuals, temporal (transferability to the future), and theoretical (transferability to other methods of measuring behavior) (Teddlie & Tashakkori, 2009). The findings of this study are partially transferrable to other contexts and other online teachers.

Reporting Quality and Utility. This study was completed within the allocated time and resources (Datta, 1997). Key aspects of the study are clearly and explicitly reported. The utility of a study is an indicator of quality. Utility refers to the usable of the findings (Datta, 1997). The findings of this study provide recommendations for future preservice teachers and teachers who intend to switch from face-to-face to online instruction.

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are something important and relevant to the study, but out of the researcher's control (Goes & Simon, 2017; Leedy & Ormrod, 2019). For instance, this study was done with an assumption that participants were willing to participate and provide honest and accurate responses. This research also assumes these participants are representatives of other K-

12 online teachers in the U.S. Therefore, their responses can be generalized to have a better understanding of online teachers' instructional planning.

Limitations and Delimitations

Limitations are potential weaknesses in the study, which are out of the researcher's control. Conversely, delimitations are characteristics that limit the scope and define the study's boundaries, which are in the control of the researcher (Goes & Simon, 2017).

There were some limitations to this study. The first limitation relates to survey participants. As participants were all recruited from MASVP, they might be too professional to represent other online teachers because they are from a virtual school and their primary teaching modality is online teaching. Therefore, they have regular and professional training in the school; they might be more experienced and have more support than teachers not teaching in virtual schools. The second limitation relates to interview participants, as all interviewees were recruited based on survey respondents who volunteered to participate. Thus, participant bias might exist. The third limitation is in the data generation method. Influenced by the COVID-19 pandemic, all the interviews were conducted by videoconferencing rather than in person. Videoconference-based conversations are less natural. There existed a lack of visual cues such as head nods, eye gaze, fewer interruptions, longer turns between speaker transitions, and fewer turns taken by participants (O'Conaill et al., 1993; Sellen, 1995). Therefore, it might affect the participants' responses to some extent in the interview. Finally, the delimitation of this study is the parameter of the participants. This study only investigates teachers in one institution in the U.S. instead of more teachers from more schools, states, and countries. Therefore, the results may not apply to other contexts.

Conclusion

The purpose of the present study is to explore teachers' priorities and frequencies of using the identified six elements in their planning; in particular, this study aims to uncover how teachers in MASVP prioritize the importance of the six identified elements, how they rank them, and how frequently they use the six elements in their planning practices. The study uses quantitative survey data to draw a general picture of their planning practice and qualitative interviews data to help explain their planning practice. The intention of this study is to provide a holistic portrait of online teaching planning practice. As this portrait is drawn through teachers from only one virtual school, the findings of this study do not generalize about how teachers plan their online instruction; the findings do, however, contribute to a richer understanding of online instructional planning.

CHAPTER 4

FINDINGS

This study explores Mid-Atlantic State Virtual Program (MASVP) teachers' instructional planning for the online environment. Specifically, it examines how teachers prioritize the importance of the six key elements for instructional planning identified by Mo et al. (2021). Data were generated through digital surveys and semi-structured interviews¹. The quantitative data were analyzed using descriptive and inferential statistics. Qualitative data composed of written responses to qualitative questions at the end of the survey questionnaire and 15 interview transcripts were analyzed by thematic analysis through Dedoose software. The findings of these data analyses have been used to answer the following research questions:

RQ1: How do elementary, middle, and high school teachers from MASVP prioritize the importance of the six identified elements in planning for online instruction?

RQ2: Is there any significant difference in elementary, middle and high school teachers' prioritization of the six identified elements in planning for online instruction based on prior online teaching experience?

RQ3: How frequently do elementary, middle, and high school teachers from MASVP use the six identified elements in planning for online instruction?

¹ Initially, I planned to collect teachers' lesson plans as artifacts to review. However, during the interviews, teachers stated they did not write formal lesson plans. Instead, they created PowerPoint presentation slides. Thus, lesson plans were not collected to review.

RQ4: Is there any significant difference in the frequencies with which elementary, middle, and high school teachers use the six identified elements in planning for online instruction based on prior online teaching experience?

RQ5. What are the beliefs implicit in practices of teachers from MASVP in planning for instruction online?

The first four questions were addressed through descriptive and inferential statistics, including comparing means, order ranking, and univariate Analysis of Variance (ANOVA). The fifth question was addressed through thematic analysis. The findings are presented in the following sections.

Survey Administration and Response Rate

The digital survey was distributed to all 144 MASVP K-12 teachers by one administrator of MASVP in October and November 2022. Four emails were sent to the teachers, the first by the end of September informing teachers about the survey. The second on October 5, and 43 responses were received in 10 days. A reminder email was sent to those who had not responded by October 16, and within two weeks, thirty-three more responses were received. On November 1, the last reminding email was sent to teachers who had not responded; twenty responses were received by November 15, the deadline for the survey.

The survey was distributed to all 144 MASVP teachers, including 29 elementary school teachers, 34 middle school teachers, 57 high school teachers, and 24 teachers who taught both high school courses and middle school courses. A total of 96 teachers responded for a response rate of 66.7%. However, twenty-three responses were removed from the analysis due to missing data, resulting in 73 valid responses for a 50.7% response rate. The total valid responses include

17 elementary school teachers, 18 middle school teachers, 20 high school teachers, and 18 teachers who have overlapped teaching responsibilities (See Table 8).

Table 8

Survey Response Rate Valid Rate by School Level

Participants School Level	Distributed Number	Valid Surveys	Valid Surveys Rate
Elementary school teachers	29	17	58.6%
Middle school teachers	34	18	52.9%
High school teachers	57	20	35.1%
Overlapped	24	18	75%
Total	144	73	50.7%

Survey Respondent Demographic Data

The digital survey, *The Instructional Planning for Online Instruction*, includes six demographic items in Part I. The items include years of teaching in MASVP, years of online teaching prior to joining MASVP, the total years of teaching online, the school level at which they primarily teach, teaching responsibilities that overlap across teaching levels, and gender.

Table 9 below shows the teaching experience information of the survey participants.

Table 9

Teaching Experience Information of the Survey Participants

Item	Category	Number of Teachers Responded	Response Percentage
Years of teaching in MASVP	1-2	64	87.7%
	3-4	3	4.1%
	5-6	0	0
	7-8	2	2.7%
	>9	4	5.5%
Years of teaching online prior to joining MASVP	1-2	61	83.6%
	3-4	2	2.7%
	5-6	3	4.1%
	7-8	0	0
	>9	7	9.6%
Total years of teaching online	1-2	30	41.1%
	3-4	26	35.6%
	5-6	3	4.1%
	7-8	2	2.7%
	>9	12	16.4%

Online Teaching Experience

Teachers who participated in this study vary in online teaching experience in terms of years. Some had online teaching experience prior to joining MASVP, whereas some had no prior online teaching experience. The majority of teachers in MASVP are novice teachers with only one to two years of experience teaching in MASVP. Table 9 above shows that there are 64 (87.7%) teachers with one to two years of experience teaching online in MASVP, three (4.1%) with three-to four years, 2(2.7%) with seven to eight years, and four (5.5%) with more than nine years of experience teaching online. Sixty-one (83.6%) teachers had only one to two years of online teaching experience prior to joining MASVP, two (2.7%) had three to four years, three (4.1%) had five to six years, and seven (9.6%) had more than nine years of online teaching experience. In total, thirty (41.1%) teachers had one to two years' experience teaching online, 26 (35.5%) had three to four years, three (4.1%) had five to six years, two (2.7%) had seven to eight years, and twelve (16.4%) had more than nine years of experience teaching online. In the data analysis process, total years of teaching online were used to represent teachers' teaching experience.

In summary, most teachers (n=56, 76.7%) who participated in the survey had less than five years of experience teaching online, including experience prior to joining MASVP and experience teaching in MASVP. Thirty of them had just started their online teaching one or two years previously in MASVP. Only 17 (23.3%) teachers had more than 5 years' experience teaching online.

School Levels

Among all 144 teachers in MASVP, 29 are from elementary school, 34 are from middle school, 57 are from high school, and 24 have overlapped school levels teaching responsibilities.

Of the 73 valid responses, 17 (23.3%) are primarily from elementary school, 18 (24.7%) are from middle school, and 20 (27.4%) are from high school. For the overlapped responsibility across school-level items, 18 (24.7%) reported they have high school and middle school teaching responsibilities. To compare with the total number of each school level in the entire school, the response rates of elementary, middle, high school teachers and teachers with overlapping teaching responsibilities are 58.6%, 52.9%, 35.1% and 75%, respectively.

Gender

In MASVP, 126 out of 144 of teachers are female while only 18 out of 144 are male. Thus, it is understandable that among the 73 valid responses, 69 are from females, and only 4 are from males. However, it should be noted that the response rates of male and female teachers are 22.2% and 53.5% respectively. This means that, based on the actual number of employed male and female teachers, male teachers are underrepresented in the findings. Table10 below shows the homogeneity of responses based on school level and gender.

Table 10*Homogeneity of Responses Based on School Level and Gender*

Category	Total Number of Teachers in the MASVP	Number of Teachers Responded	Response Percentage
School level			
Elementary school	29	17	58.6%
Middle school	34	18	52.9%
High school	57	20	35.1%
Overlapped school levels	24	18	75%
Gender			
Male	18	4	22.2%
Female	126	69	53.5%

Findings for Research Question 1: How Do Elementary, Middle, and High School Teachers from MASVP Prioritize the Importance of the Six Identified Elements in Planning for Online Instruction?

Part II and Part III of the survey address the first research question. Part II is a 5-point Likert scale, asking teachers about the level of importance of each of the six elements in their online instructional planning. The Likert scale ranges from 1 (not at all important) to 5 (extremely important). Part III is an ordinal ranking scale in which teachers were requested to rank in order the six elements based on their perceived importance, from 1 (most important) to 6 (least important). Descriptive statistics (such as frequency, means, and standard deviation) are

calculated for both parts through Statistical Package for Social Science (SPSS) software. Mean rankings are ordered to determine the importance order of each element. The findings of these two sections of the survey are presented below.

Table 11 below presents Part II's findings regarding how important teachers find each of the six elements in their online instructional planning. Most teachers selected *very important* or *extremely important* for all the six elements, resulting in mean scores of all six elements of greater than 4 with a range of 4.15 to 4.49. Very few teachers, only five in total, selected *slightly important* or *not at all important* for all six elements, indicating teachers regard all the six identified elements as very-to-extremely important elements in their online instructional planning.

Among the six elements, *Learning Activities and/or Teaching Strategies* was identified as the most important one, with 41 (56.2%) teachers out of 73 valid responses selecting *extremely important*, 28 (38.4%) selecting *very important*, three (4%) selecting *moderate important*, and one (1.4%) teacher selecting *slightly important*. No one selected *not at all important*. In total, 94.6% of teachers selected *very important* or *extremely important*. The mean score is 4.49.

The least important element among the six was *Learner Analysis*. Twenty-seven (37%) teachers out of 73 valid responses selected *extremely important*, thirty-three (45.2%) teachers selected *very important*, eleven (15.1%) selected *moderate important*, two (2.7%) teachers selected *slightly important*, and none selected *not at all important*. Even though this element was identified as the least important among the six elements, 82.2% of 73 teachers considered it very important. The mean score was 4.15, which indicated it was also an essential element in online instructional planning.

Content Design is identified as the second most important element, with a mean score of 4.36, and *Communication and/or Interaction* was the third, with a mean score of 4.34. Finally, *Learning Tools and Media* has the same mean score (4.30) with *Assessment and/or Evaluation*; therefore, they were both fourth most important elements.

Table 11*Teachers' Identified Importance of the Six Elements*

Item	<i>N</i>					<i>M</i>	Mean Order	<i>SD</i>
	Not at all important	Slightly important	Moderately important	Very important	Extremely important			
Learning Activities and/or Teaching Strategies	0	1	3	28	41	4.49	1	.648
Content Design	1	1	6	28	37	4.36	2	.806
Communication and/or Interaction	0	1	3	39	30	4.34	3	.628
Learning Tools and/or Media	0	1	6	36	30	4.30	4	.681
Assessment and/or Evaluation	0	1	7	34	31	4.30	4	.701
Learner Analysis	0	2	11	33	27	4.15	6	.782

Note. Although the survey responses were designed as ordinal ranking categories, the aggregation of the scores by category were treated as interval data, allowing for means and standard deviations to be calculated.

Table 12 presents the findings of Part III, rank ordering of the importance of the six elements. As shown in the table, the ranking is not clustered, given the big difference in mean scores among the six elements. The lowest (the lower, the more important) score is 2.41. And the highest (the higher, the less important) is 4.78. The order based on the mean scores is *Content Design* (2.41), *Learning Activities and /or Teaching Strategies* (2.60), *Communication and/or Interaction* (3.19), *Learner Analysis* (3.81), *Learning Tools and Media* (4.22), and *Assessment and Evaluation* (4.78). This order indicates that *Content Design* is the most important element followed by *Learning Activities and /or Teaching Strategies*, *Communication and/or Interaction*, *Learner Analysis*, *Learning Tools and Media*, and *Assessment and/or Evaluation*.

Content Design and *Learning Activities and /or Teaching Strategies* have the most scores of ones and twos. *Learning Tools and Media* and *Assessment and/or Evaluation* have the least scores of ones and twos. *Content Design* was ranked first, with 30 (41.1%) out of 73 ranking it as most important, seventeen (23.3%) ranking it second important, nine (12.3%) ranking it the third important, seven (9.6%) ranking it the fourth important, three (4.1%) ranking it the fifth important and seven ranking it the least important. The mean score is 2.41. In total, 64.4% of 73 teachers regarded *Content Design* as a very important element in online instructional planning.

The second important element as ranked by the teachers is *Learning Activities and/or Teaching Strategies*. Specifically, seventeen (23.3%) teachers rank it *the most important*, twenty-one (28.8%) rank it *the second important*, seventeen (23.3%) rank it *the third important*, eleven (15.1%) rank it *the fourth important*, six (8.2%) rank it *the fifth important*, and only one (1.4%) ranks it as the *least important*. The mean score is 2.60.

Interestingly, the order of *Content Design and Learning Activities and/or Teaching Strategies* is reversed with the findings in *Part II*, where *Learning Activities and/or Teaching Strategies*

Strategies is ranked highest, and *Content Design* is second. Another interesting finding is that *Communication and Interaction* held the same place (the third important element) in both parts. *Learner Analysis* came in very different in two parts: the least important element in Part II, but the fourth most important element in Part III.

In sum, all six elements are identified as *very important* in online instructional planning. However, when ranking the specific order of the six, teachers appear to have different standpoints on each element. Thus, standard deviations are relatively large in rankings. *Content Design*, *Learning Activities and/or Teaching Strategies*, and *Communication and/or Interaction* are the most important three and *Assessment and/or Evaluation* is the least important element. Overall, the mean values and rankings are not substantially different. These two parts of the survey required teachers to complete two different tasks concerning teachers' priorities of the importance of the six elements. The results of the two parts are consistent whether rating the importance of the six elements using a Likert scale or a forced prioritization. The changes in placement may be due to the differences of the task rather than the difference in their actual views of the importance of each element.

Table 12*Teachers' Order Ranking of the Six Elements*

Elements	Frequency of Ordered Responses (n=73)		Frequency and Percentage of Teachers (n=73)		<i>M</i>	Teacher Mean of Rank	<i>SD</i>
Content Design	#1=30 #3=9 #5=3	#2=17 #4=7 #6=7	#1 (41.1%) #3 (12.3%) #5 (4.1%)	#2 (23.3%) #4 (9.6%) #6 (9.6%)	2.41	1	1.64 0
Learning Activities and/or Teaching Strategies	#1=17 #3=17 #5=6	#2=21 #4=11 #6=1	#1 (23.3%) #3 (23.3%) #5 (8.2%)	#2 (28.8%) #4 (15.1%) #6 (1.4%)	2.60	2	1.29 9
Communication and /or Interaction	#1=15 #3=9 #5=15	#2=15 #4=14 #6=5	#1 (20.1%) #3 (12.3%) #5 (20.1%)	#2 (20.1%) #4 (19.2%) #6 (6.8%)	3.19	3	1.63 0
Learner Analysis	#1=10 #3=14 #5=12	#2=6 #4=16 #6=15	#1 (13.7%) #3 (19.2%) #5 (16.4%)	#2 (8.2%) #4 (21.9%) #6 (20.1%)	3.81	4	1.65 5
Learning Tools / Media	#1=0 #3=18 #5=16	#2=8 #4=14 #6=17	#1 (0) #3 (24.7%) #5 (21.9%)	#2 (11%) #4 (19.2%) #6 (23.3%)	4.22	5	1.34 6
Assessment / Evaluation	#1=1 #3=7 #5=21	#2=5 #4=11 #6=28	#1 (1.4%) #3 (9.6%) #5 (28.8%)	#2 (6.8%) #4 (15.1%) #6 (38.4%)	4.78	6	1.31 5

Note 1. #1=Most important, #2=Second most important, #3= Third most important, #4= Fourth most important, #5=Fifth most important, #6=Least important.

Note 2. Although the survey responses were designed as ordinal ranking categories, the aggregation of the scores by category is treated as interval data, allowing for means and standard deviations to be calculated.

Findings for Research Question 2: Is There Any Significant Difference in Elementary, Middle, and High School Teachers' Prioritization of the Six Identified Elements in Planning for Online Instruction Based on Their Years of Experience in Online Teaching?

Univariate analysis of variance (ANOVA) was conducted to examine both Part II Likert Scale and Part III Rank Ordering because these two parts reflect teachers' priority of the importance of the six elements. In the univariate ANOVA, school level is used as a fixed factor, and teaching experience as a covariate. The p values of teaching experience of all elements are greater than .05, indicating no statistically significant differences among teachers with different years of teaching in selecting and ranking the importance of the six identified elements. This indicates that teaching experience has no influence over teachers' prioritizing of the six identified elements. Furthermore, the p values of all elements except one in both Part II and Part III are not significant in Levene's Test, indicating that the assumption of homogeneity of variances is not violated, validating univariate ANOVA as a good model for this analysis. Table 13 presents the p values of Levene's test and teaching experience in two parts.

Table 13

p values of All Six Elements in Part II and Part III in Levene's Test and p Value of Covariate

Elements	<i>p</i> values in Levene's Test		<i>p</i> values of Covariate (Teaching Experience)	
	Part II	Part III	Part II	Part III
Content Design	.340	.275	.386	.240
Learner Analysis	.304	.856	.264	.134
Learning Activities and/or Teaching Strategies	.518	.731	.238	.130
Learning Tools and/or Media	.116	.986	.439	.595
Communication and/or Interaction	.796	.682	.206	.727
Assessment and/or Evaluation	.452	.028	.463	.476

For Part II, a statistically significant difference was found among school levels on teacher's selecting the importance of *Content Design* (see Table 14), $F(2, 69) = 4.480, p = .015$ and *Learner Analysis* $F(2, 69) = 4.188, p = .019$. To examine where the differences are, Pairwise Comparisons were run. For *Content Design*, Pairwise Comparisons shows that there is a statistically significant difference between elementary school teachers and high school teachers ($p = .021, d = 0.986$), with a mean difference of .561. Additionally, there is a statistically significant difference between middle school teachers and high school teachers ($p = .012, d = 0.654$), with a mean difference of .559. This indicated that high school teachers perceive less importance on *Content Design* than both middle school teachers and elementary school teachers. For *Learner Analysis*, Pairwise Comparisons shows a statistically significant difference between elementary school teachers and high school teachers ($p = .006, d = 0.983$). The mean difference

is .661, which indicates that elementary school teachers hold *Learner Analysis* to be more important than high school teachers.

Table 14

Means, Standard Deviations, and Univariate ANOVA in the Importance of the Six Identified Elements Based on School Levels

Measure	Elementary school		Middle School		High School		<i>F</i> (2, 69)	Partial η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Content Design	4.59	.618	4.62	.498	4.09	.951	4.480*	.115
Learner Analysis	4.53	.514	4.24	.700	3.94	.873	4.188*	.108
Learning Activities and/or Teaching Strategies	4.41	.712	4.48	.602	4.54	.657	.948	.002
Learning Tools and/or Media	4.24	.903	4.33	.577	4.31	.631	.051	.001
Communication and/or Interaction	4.47	.514	4.48	.602	4.29	.572	1.435	.040
Assessment and/or Evaluation	4.59	.507	4.10	.700	4.29	.750	2.121	.058

* $p < .05$

No statistically significant differences are identified among school levels for *Learning Activities and/or Teaching Strategies, Learning Tools and Media, Communication and/or Interaction, and Assessment and/or Evaluation*.

The *F* values of all the elements in Part III are insignificant (see Table 15), indicating that in ranking the importance of the six identified elements, there are no statistically significant differences among teachers from different school levels.

Table 15

Means, Standard Deviations, and Univariate ANOVA in Ranking of the Importance of the Six Identified Elements Based on School Levels

Measure	Elementary school		Middle School		High School		<i>F</i> (2,69)	Partial η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Content Design	2.35	1.730	2.29	1.384	2.51	1.772	.177	.005
Learner Analysis	4.18	1.704	3.24	1.546	3.97	1.654	1.935	.053
Learning Activities and/or Teaching Strategies	2.82	1.468	2.71	1.189	2.43	1.290	1.146	.032
Learning Tools and/or Media	4.35	1.320	4.43	1.363	4.03	1.361	.786	.022
Communication and/or Interaction	2.94	1.519	3.10	1.841	3.37	1.573	.496	.014
Assessment and/or Evaluation	4.35	1.498	5.24	.944	4.71	1.363	2.146	.059

** $p < .05$

In conclusion, school levels had a statistically significant influence on teachers' selections of the importance of *Content Design* and *Learner Analysis* but had no statistically significant influence on other elements. In addition, there were no statistically significant differences in teaching experience for the relative importance of each element and the rank ordering of each element.

Findings for Research Question 3: How Frequently Do Elementary, Middle, and High School Teachers from MASVP Use the Six Identified Elements in Planning for Online Instruction?

This research question is addressed by Part IV of the survey regarding teachers' frequency of using the six elements in their planning using a 5-point Likert Scale with 1 (Never), 2 (Sometimes), 3 (About half of the time), 4 (Most of the time), and 5 (Always). As shown in Table 16 below, most teachers used these six elements in their planning at least half of the time. The mean scores of three elements (*Learning Activities and/or Teaching Strategies*, *Learning Tools and Media*, *Communication and/or Interaction*) are higher than 4, which indicates teachers use these three elements in their planning most of the time. Another three elements (*Content Design*, *Assessment and/or Evaluation*, and *Learner Analysis*) are lower than 4 but higher than 3, indicating that teachers use these three elements in their planning at least half of the time.

Interestingly, the order of the three elements is the same as the orders of Part II Likert Scale. They are *Learning Activities and/or Teaching Strategies* (No. 1), *Communication and/or Interaction* (No.3), and *Learner Analysis* (No. 6). Specifically, for *Learning Activities and/or Teaching Strategies*, 45 (61.6%) out of 73 selected *Always* and 24 (32.9%) selected *Most of the Time*. The combination of these two selections reached up to 94.5%. The other 5.5% of teachers selected *About half of the time*. No one selected *Sometimes* or *Never*. The mean score is 4.56.

This indicates that *Learning Activities and /or Teaching Strategies* is an element that teachers always use in their planning.

Table 16

The Frequency of Teachers' Use of the Six Identified Elements

Item	N					M	SD	Order
	Never	Sometimes	About half of the time	Most of the time	Always			
Learning Activities and/or Teaching Strategies	0	0	4	24	45	4.56	.601	1
Learning Tools and/or Media	0	3	5	28	37	4.36	.788	2
Communication and/or Interaction	0	4	3	33	33	4.30	.794	3
Content Design	1	7	11	28	26	3.97	1.013	4
Assessment and/or Evaluation	0	3	18	30	22	3.97	.849	4
Learner Analysis	0	7	16	33	17	3.83	.903	6

For *Communication and/or Interaction*, 33 (45.2%) out of 73 teachers selected *Always* and 33 (45.2%) selected *Most of the time*. The mean score is 4.30, ranking No. 3. The ranking order is the same as in Part II and Part III. For *Learner Analysis*, 17 (23.3%) out of 73 selected *Always*, 33 (45.2%) selected *Most of the time*, 16 (21.9%) selected *About half of the time*, and seven (9.6%) selected *Sometimes*. The mean score is 3.81, which indicates that about 30% of teachers do not often include this element in their planning. This element is ranked the least important among the six, the same as in Part II.

Learning Tools and Media is an element worth discussing. The rank of this element differs in the three parts. In this part, it is ranked second. Thirty-seven (50.7%) out of 73 teachers selected *Always*, and 28 (38.4%) teachers selected *Most of the time*. The mean score is 4.36. However, in Part II, it is ranked fourth and in Part III, it is ranked fifth. The ranking of *Assessment and/or Evaluation* is comparatively steady. It is ranked fifth in Part II and Part IV, but sixth in Part III.

In sum, the data shows that when teachers are planning their online instruction, they most frequently plan learning activities and/or teaching strategies, learning tools and/or media, communication and/or interaction, and comparatively less frequently plan content, assessment and/or evaluation, and learner analysis.

Findings for Research Question 4: Is There any Significant Difference in the Frequency with Which Elementary, Middle, and High School Teachers Use the Six Identified Elements in Planning for Online Instruction Based on Their Online Teaching Experience?

Similar to research question 2, this question is addressed by univariate ANOVA. Table 17 below shows no statistically significant difference among teachers in different school levels in the frequency of using the six identified elements. This indicates that school levels and teaching

experience have no influence on the frequency of using the six identified elements in their planning for online instruction.

Table 17

Means, Standard Deviations, and Univariate ANOVA in the Frequency Teachers Use the Six Identified Elements Based on School Level

Measure	Elementary school		Middle School		High School		<i>F</i> (2,69)	Partial η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Content Design	4.06	.966	4.19	.750	3.80	1.158	1.406	.039
Learner Analysis	4.18	.636	3.76	.768	3.69	1.051	2.354 .011	.064
Learning Activities and/or Teaching Strategies	4.59	.712	4.57	.57	4.54	.611		.000
Learning Tools and/or Media	4.59	.618	4.14	.793	4.37	.843	1.421	.040
Communication and/or Interaction	4.35	.786	4.24	.768	4.31	.832	.899	.003
Assessment and/or Evaluation	4.29	.772	3.67	.796	4.03	.923	2.486	.067

** $p < .05$

Findings for Research Question 5: What are the Beliefs and Practices of Teachers from MASVP in Planning for Online Instruction?

This question is addressed by analyzing interview transcripts and answers to the qualitative questions in the Survey Questionnaire. The content begins with teachers' (participants') demographic information and is followed by the themes that emerged and synthesized from the data.

Demographic Information for Teachers Interviewed

As is stated in Chapter 3, the participants in the interview are 15 teachers from MASVP, including four high school teachers, three teachers who had overlapped teaching levels of high school and middle school, five middle school teachers, and three elementary teachers. Three of the teachers have more than five years of online teaching experience. Two have four years, and all the others have two or three years of online teaching experience. The demographic information of the participants is presented by pseudonyms in Table 18.

Table 18*Demographic of Teachers Interviewed*

Name (Pseudonyms)	School Level	Teaching Subject(s)	Total Years of Teaching Online
Tom	High school	Government & World History	3
Amy	High school	Science & Math	16
Sally	High school	Science	9
Lisa	High school	Arts	2
Lily	High & middle school	French	3
Martin	High & middle school	Latin	2
Linda	High & middle school	Physical science & A.P. Biology	2
Susan	Middle school	Math	3
Kelly	Middle school	Health & P.E.	4
Kate	Middle school	English	3
Sammy	Middle school	English	3
Jack	Middle school	U.S. History	2
Ann	Elementary school	All subjects	4
Lydia	Elementary school	All subjects	6
Jane	Elementary school	All subjects	2

Findings From Interviews and Open-Ended Question Responses in the Survey

Based on the six steps of thematic analysis proposed by Braun and Clarke (2006), the transcripts were read and the survey responses were documented several times to get familiar

with the data. Then, the transcripts and the survey responses document were uploaded to Dedoose; six *a priori* codes were created based on the six elements identified in Mo et al. (2021): *Content Design, Learner Analysis, Learning Activities and/or Teaching Strategies, Learning Tools and Media, Communication and/or Interaction, and Assessment and/or Evaluation*. In the coding process, another 10 codes emerged. Thus, there were 16 codes in total. And 71 subcodes emerged under these 16 codes. The emerged 10 codes were *Daily and Module Planning, Engagement, Time Management, Professional Development, Strengths of Online Instruction, Challenges of Online Instruction, Similarities of Face-to-Face and Online Instruction, Differences Between Face-to-Face and Online Instruction, Recommendations for Preservice Teachers, Recommendations for Teachers Who Intends to Transition to Online Instruction*. In total, 947 excerpts were identified. After reading and rereading all the excerpts, codes, and subcodes, 4 themes were identified, including: *Key Elements, Strengths and Challenges, Similarities and Differences, and Recommendations for Teachers*. Table 19 above shows the themes, codes, subcodes, and excerpt frequency.

Table 19*Themes, Codes, Subcodes, and Frequency*

Themes	Codes	Subcodes	Frequency
Key Elements	Content design	Learning content	39
		Objectives/Standards/Expectations	16
		Pacing & Sequence	22
		Methods of planning (e.g., Backward mapping, Collective planning),	21
		Sources	4
		Resources	8
		Accessibility/Copyright	3
	Learner Analysis	Ways to get to know learners	24
		Ways to meet learners' needs	20
		Learners' needs	14
		Use of learners' needs' data	13
	Learning activities/ Teaching strategies	Types of activities	34
		Tools used to facilitate the activities	15
		Reasons for selecting the activities	23
	Learning Tools and Media	Names of the tools and media	45
		Reasons for selecting these tools	33
		Limitations of using some tools	8
		Roles of digital technology in online	18
		Examples of integrating technology into pedagogy	34
	Communication/ Interaction	Tools used to communicate	80
		Types of communication	24
		Importance of communication	9
	Assessment/ Evaluation	Tools of assessment	22
		Types of assessment	33
		Use of the assessment data	20
	Engagement	Content	8
		Class participation	6
		Interaction	6
	Time	Time difference	2
		Time of planning	2
Strengths and Challenges	Strengths	Easy to get immediate/instant feedback	3
		Easy to adjust instruction	1
		No need to worry about classroom management issues	2
		Multiple attempts to get points back	2
		Structured and organized content	1

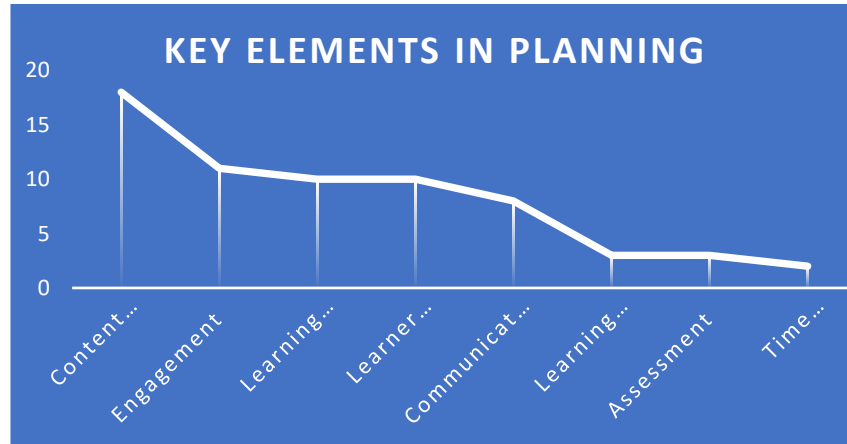
		Strong students' accountability	1
		Helpful one-on-one meetings	1
		Easy to refer back to the learning	1
	Challenges	Learner	5
		Communication and Interaction	9
		Content	4
		Engagement	11
		Assessment	9
		Learning tools	7
		Social-emotional skills	2
		Time	3
		Learning activities	2
		Learning outcomes	2
		Cheating	10
Similarities and differences between face-to-face and online	Similarities	Learning tools and media	6
		Learners	4
		Learning activities	11
		Assessment	5
		Communication and interaction	2
		Learning experience	4
	Differences	Assessment	26
		Communication and interaction	24
		Content and resources	17
		Engagement	8
		Learning activities and teaching strategies	31
		Learner needs	8
		Lesson plans	15
		Time difference	8
		Tools and media	17
		Social elements	4
Recommendations for future teachers	Preservice teachers		38
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Key Elements. All 15 teachers interviewed, and 22 survey responses discuss key planning elements. Even though teachers' answers vary, the key elements cluster into certain patterns. Specifically, all 15 teachers interviewed and three survey responses regard *Content* as a

key element, eight teachers interviewed and three survey responses consider *Engagement* as a key element; eight teachers interviewed and zero survey response regard *Communication and/or Interaction* as a key element; seven teachers and three survey responses regard *Learning Activities and/or Teaching Strategies* as a key element; four teachers interviewed and six survey responses consider *Learner Analysis* as a key element; three teachers interviewed regard *Assessment* as a key element; three survey responses show *Learning Tools and Media* is a key element; two interviewed teachers claim that *Time Management* is a key element. The total number of teachers interviewed and survey responses and the key elements they support is presented in Figure 10 below. The details of each element are presented thereafter.

Figure 10

Key Elements Identified by Teachers



Note. X-axis are key elements; Y-axis is the number of teachers who mention these key elements.

Content Design. Content is discussed by all 15 teachers and three survey responses from different perspectives; this includes the content of learning, objectives, standards, expectations, pacing & sequence, methods of planning, sources, resources, and accessibility and copyright. Specifically, four teachers state that they make clear objectives in their planning. Three teachers refer their planning to the state standards. Two teachers say they would like their students to know the content they are going to learn and their responsibilities. All 15 teachers mention that the content of the course is premade or pre-built by course writers. Ten teachers state they use a pacing guide to plan daily instruction. Five teachers mention their methods of planning, e.g., Backward Mapping, and one elementary teacher states her team has collective planning. Six teachers claim they plan creative, interactive, and fun activities to engage students. One teacher claims there are four quizzes and one final test in each module to support the objectives. In addition, she prepares exit tickets and essential questions to check students' understanding in each live session. In general, teachers report that each course has eight modules to cover in an academic year. Therefore, each semester, they needed to complete four modules. In MASVP, the module content and module assessment have been premade or pre-built by course writers or the curriculum team. The pacing guide of each course is also created by the grade-level team. Therefore, teachers do not need to prepare the content from scratch. They look at the content and assessment in the module and pace them out in daily live sessions or pace out the asynchronous work for those students who studied asynchronously. The following quotes show how teachers plan their daily instructions:

In Mid-Atlantic State Virtual Program, all the courses are sort of pre-made, so the content, some activities and assessments are already there. So, the first thing I do is to

look at the lessons for a week to see what's in there, what the assessments are like, what types of things are asked on the assessments.

The content is already built at Mid-Atlantic State Virtual Program, the course shells, as we call them. ... So, I always start there with what I really want them to take from the lesson. You know, and I always look to make sure which pieces with the SOL lines up with that with Mid-Atlantic State Virtual Program. And I like to put it in a way that they can understand.

The best way for me to plan for daily instruction is No. 1, looking at the objectives and standards of learning for 4th grade ...; then, I have a really good foundation of what's going to be expected of the students. I then look at the material that's available to me through our online program. So, I will look through what's called our modules. I will look at the information that's being presented on each page of that module. I try to break down the daily lesson into small parts ... As we go throughout the week, it's kind of like an "*I do, we do, you do*" model. I start to present information and then we will practice it together as a whole group, and then when we break into our small groups.

Most teachers found the content MASVP provides to be well structured, organized, and very helpful. However, some teachers report some issues about premade content. For instance, one teacher asserts the premade content fails to meet the needs of students at different levels, suggesting each course should offer different content levels geared towards diverse learning needs. Two teachers (one elementary teacher and one middle school teacher) state that the language of the premade content is difficult for students to understand. Therefore, they need to make it more easily understandable in their planning. Another issue mentioned by several teachers is about the copyright of the resources, materials, websites, or images they are able to

use. Four teachers state that anyone teaching online needs to be mindful of the copyright of the resources, materials, websites, or images to be used and that this issue makes the class activities challenging. As one teacher said, “Copyright is a huge factor in planning for online instruction. That can make class activity engagement challenging.” Another agrees:

We have some limitations on what types of online resources we can use. So, I am much more limited by copyright types of things. In the online environment, we can only use that under Creative Commons and I can’t show those video clips I would normally show in a face-to-face setting in my live sessions at all. So, I have some limitations in what I can actually use.

Engagement. Engagement is stressed by 11 teachers. Most of them focus on the challenges of engaging students. One teacher asserts that “Student engagement is always a challenge. Many times, during synchronous sessions students turn off their cameras and do not engage in the lesson.” Another teacher continues, “It can be more difficult to engage students in a virtual classroom in interactive and group work. You can’t walk over to a student and take away a device or redirect as easily. These issues have to be taken into consideration when planning activities.”

To engage students, teachers need to ensure that learning content and learning activities are engaging. They state that, even with premade content, they need to find interesting things within it and figure out which resources allow as many students as possible to participate and engage in learning. In addition to the content, teachers also create learning activities to engage students. This is critical because, in an online setting, it is challenging to get students to engage in learning. They may sign in the zoom but do something else. Teachers cannot tell whether they

are engaging or not. Thus, making the content and learning activities engaging is crucial. The following quote supports this claim:

I am trying so hard not to bore them. I feel like it's so much harder in a virtual environment to get them through because they don't technically; I mean, they can turn on zoom and watch TV. I can't prove that they are not engaging with me. They don't want to come to zoom and just hear me talk for 40 minutes. They want to come to a zoom that seems to be of value.

Learner Analysis. Ten teachers emphasize learners in the interview. They discuss this from four perspectives: ways to get to know learners, learner needs, ways to meet learner needs, and how teachers used the data to help their planning. Twelve teachers share ways to get to know students' learning needs. Most teachers use formal or informal assessments, such as regular quizzes data and check-ins, to judge students' understanding, students' strengths, and weaknesses. One teacher shares, "I look at the results of their assessment and look at where their strengths and weaknesses are as far as how they're performing." Another states, "I use their answers to the questions at the end of my live sessions" while another "just keep[s] an eye on their grades." Some teachers learn about students' backgrounds and motivations for learning online by asking questions. One teacher states, "It's just through the process of getting to know them in the live sessions, or through email communications and understanding what their backgrounds is like. It's helpful for me to know a little bit about why they are taking an online class." Some teachers use activities to learn about students' interests, as shared by one educator: "I use that activity a lot to tell me how much of the subject area they really understand." Others use one-on-one communication, students' answers to the questions at the end of the session, surveys, and students' feedback to get to know student learning needs.

Two types of needs are identified across the interview data and survey responses: academic needs and social-emotional needs. Academic needs include teacher support and parental support for students in both synchronous learning and asynchronous learning, technology or manipulatives needs, and different motivations for learning online. Social and emotional needs included student-teacher relationship and the sense of a whole class learning community. Teachers state that “Students in virtual learning may feel lonely and isolated.”

Thirteen teachers mention ways to meet students’ learning needs. Most teachers use small groups or one-on-one meetings to do remediation or help those who are really struggling. One teacher claims, “We have a huge one-on-one time. That is where I find my best remediation happens.” Another asserts, “I help them through some groups or one-on-one, something like remediation, but not called remediation.” Some other methods include using the results of quizzes and tests to really hone-in on the next day’s lesson and accommodate students at different levels. For social-emotional needs, teachers said they used students’ demographic information to build rapport and relationships with students and provide constant support. Two teachers even did “Zoom Lunch” for the class to build a sense of learning community.

Ten teachers take the student learning needs into account to help with their planning. Some teachers use such needs to tailor their lesson plans and adjust and attune their teaching to suit or accommodate students’ learning styles. Some teachers use this consideration when identifying students for book clubs or one-on-one remediations. One teacher explains this well, stating, “The more I get to know them, the more I can tailor my lesson plans to meet their needs in terms of what they like to do, and the types of activities are going to engage in the most.” Other teachers agree when they say, “I use it to adjust my plan,” “I use their information to really

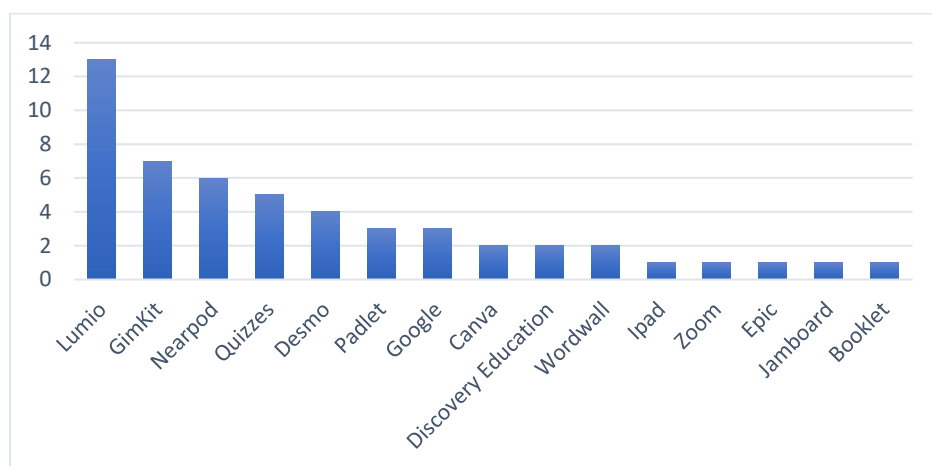
hone-in on what is my lesson for the next day,” and “I use the data or the feedback to get to know their understanding and guide my teaching.”

Learning Activities and/or Teaching Strategies. Fourteen teachers describe the activities and/or teaching strategies they use. Those activities and/or teaching strategies include low stake group work, games, quizzes, hands-on activities, one-on-one meetings, direct questions, guiding steps or guiding drawing, gamified activities, repetition, games and competitions, questions and answers, workout activities (P.E.), lectures, labs, demonstrations, and scenarios, read-out-loud and role plays, fun activities, interactive activities, callouts, breaks, movement, and chant. Games and one-on-one meetings are the most frequently used activities for all teachers. Their statements support this claim: “Gamified activities are helpful” and “I love gamification.” Teachers select and use these activities based on the students’ background, teacher’s background (such as Montessori background), easiness of the set-up of the activities, students’ feedback, learning objectives, state standards, and relevance to students’ lives. One teacher explains, “I come from Montessori background. I want my students to be motivated to actually learn the content, not just move through the steps.” Another states, “I always want to make sure that it’s something that focuses on our objectives.”

Learning Tools and Media. The tools or media used by the teachers include Lumio, Nearpod, GimKit, Desmo, Quizzes, Padlet, Canvas, Discovery Education, Wordwall, Google, iPad, Zoom, Epic, Jamboard, and Booklet. The most frequently used tools and media are Lumio, GimKit, Nearpod, Quizzes, and Desmo. Teachers commented, “Lumio is the most user-friendly one” while “Nearpod is another one.” One teacher mentions several online resources: “I definitely use Canvas all the time. I also use GimKit and the kids love that.” The specific frequency of each tool or media teachers use is presented in Figure 11 below.

Figure 11

The Tools or Media Teachers Usually Used in Their Online Instruction



Note. The x-axis presents the names of the tools or media. The y-axis shows the number of teachers mentioned those tools or media.

Teachers select these tools because of the (1) accessibility, (2) usefulness, (3) easiness to use, and (4) how well they match the learning content. One teacher shares why Lumio is a preferred tool:

I use Lumio a lot. Lumio is an interactive educational tool, and you can play games in Lumio. I can put my Google slides in Lumio, and then that way, kids can manipulate things on the screen. I can see who's working in there, who's practicing, and who isn't.

Teachers provided two types of answers when asked what role technology plays in their online instruction. Some asserted how essential technology is in their instruction: "It's everything," "It's 100%," "It plays a huge role," "It plays a really big role," "It plays a vital role," and "It's the whole basis." However, believe technology is simply a tool: "Tools are tools. They can be helpful, but they don't like a replacement," "It's just part of my live session," "Technology is a bridge, a great way to bring quality teaching and quality content with a real

person to kids.” These teachers still believe that technology should be integrated into their pedagogy. One teacher shared how she integrates technology into her pedagogy:

For example, yesterday we were doing a poetry. So, I had the students going to a site. It’s a link that I put in the chat I created and then they get a Padlet, and we’ve been working with limericks. So they had to crack that. They would write a limerick and then once they write it, it pops up on the screen to me and I read over it that I click approve or decline and then I approve it and it pops up on the screen and it’s basically like an online bulletin board kind of thing, and then all the kids get to see like, oh, you know, there are limericks and who wrote what, read over some of them and practice. So, they can see other students’ work.

In addition, many teachers claimed they are limited to using some technological tools, such as YouTube videos, Kahoot, and websites that require students to create accounts. There are some restrictions concerning copyright regulation and students’ private data, imposing limitations on the tools and media teachers could use. One teacher comments on this difficulty, “There are so many tools that would be very good tools that we’re not allowed to use for various reasons, mostly related to privacy.” Another agrees, “In Mid-Atlantic State Virtual Program, we aren’t allowed to use a lot of things. If it collects a student’s data, we aren’t allowed to use.”

Communication and/or Interaction. The teachers interviewed reveal three types of communication and/or interaction: teacher-student, student-student, and teacher-parent interaction. Teacher-student communication or interaction is the most prevalent form of communication. Teachers need to communicate with students about what to learn, how to learn, where to learn, and how to examine what they learn. In addition, teachers also send messages to remind students about their assignments and other issues. Two teachers explain:

We always send a weekly newsletter, and that newsletter is going to provide what modules will be working through that week, what the topics will be and provide them with an overview of what their assignments will look like for the week, so that they can start to be prepared.

I send a lot of inbox messages throughout the week to students reminding them of their small group times reminding them that they have a remediation group, and then we're also able to push out inbox messages if they've forgotten the assignment.

Student-student interaction is reportedly challenging in virtual settings. Although there is consensus over the importance of student-student interaction, teachers also express the need to be cautiously respectful of students' privacy needs and etiquette norms. In MASVP, teachers are not allowed to share a student's contact information with other students. As a result, they can only have students interact through discussion boards, group project pages, or a live session chat box. One teacher asserted:

I think that in the virtual setting, it's really important to handle the students with care, and create opportunities for learner interaction where they can have the positive experience communicating with their peers that some of them may not have experience in the brick-and-mortar settings. And that creates a feeling of safety and value for the students, and when students feel safe and valued, it helps them to be ready to learn.

Teacher-parent interaction is also stressed by teachers. Teachers emphasize that communication must be more proactive and intentional with online instruction, especially with asynchronous students. One elementary teacher shares when teaching in a brick-and-mortar school, she needed to prepare all the manipulatives for students. But in this setting, parents need

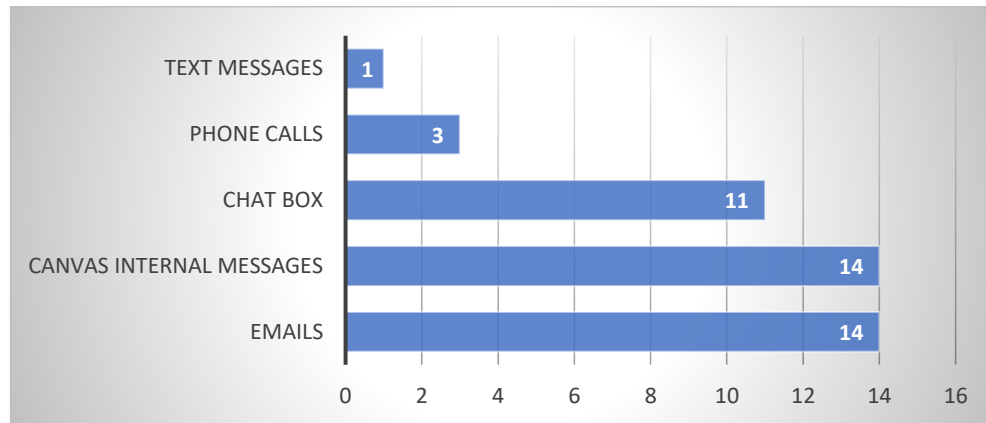
to prepare those things for their children. If a parent does not prepare for their child or children, teachers cannot help. The following quote supports this claim,

I think communication with parents is incredibly important because they need to be prepared ahead of time in this environment. I think that parent support at home is really critical because again, I only have so much reach here through a computer screen. So we need to also have the engagement of the parents as much as possible, because they're really the secondary teacher at home who is making sure that the students are following up with their work after class.

Teacher-student communication and interaction tools included weekly newsletters or announcements, inbox messages, chat boxes, emails, one-on-one zoom meetings, phone calls, text messages, and zoom lunch together. Teacher-parents communication and interaction tools include emails and phone calls. Student-student communication and/or interaction include breakout rooms, discussion boards, group projects, group discussion pages, and Padlets. Figures 12 and 13 show the frequency of each type of communication tools and media used by teachers.

Figure 12

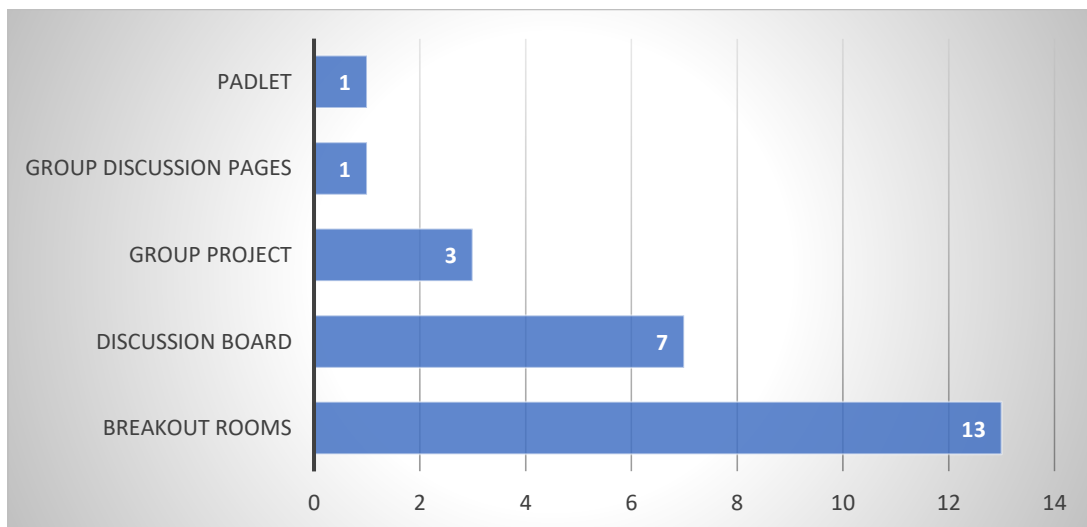
Teacher-Student Communication and/or Interaction Tools Used by Teachers



Note. The x-axis presented the number of teachers. The y-axis showed the tools they used to communicate.

Figure 13

Student-Student Communication and/or Interaction Tools Used by Teachers



Note. The x-axis presented the number of teachers. The y-axis showed the tools they used to communicate.

Most teachers use a chat box to communicate with students during the live sessions. But for asynchronous sessions, they use emails and Canvas to communicate with students. One teacher explains, “We use a lot of emails. Kids are really more comfortable with emails than they are with calling.” Another teacher added,

So, for asynchronous communication, I would say Canvas is what I use the most because I can send emails, messages, make posts, make announcements, record videos and then my videos there. And it also gives them a place to communicate with one another if I set it up that way. They can’t necessarily message each other. They don’t have a list of everybody that’s in the class, but if I put them in a group together, then I know who’s at their group and they can get with one another that way.

Assessment and/or Evaluation. Teachers used formative assessment and summative assessment to evaluate students learning. Formative assessment approaches included quizzes and assignments in the LMS Canvas, questions and answers, small group instruction or one-on-one meetings, learning activities, games, projects, slide presentations, quick checks, exit tickets, portfolios, and data charts. Among all these quizzes and assignments in the LMS, quick checks, exit tickets, and one-on-one meetings are the most frequently used approaches for formative assessment. One teacher uses small quizzes throughout each unit:

I think it’s a lot of informal assessments where, you know, I ask my question and they answer it back to me. There are a lot of quizzes built into the class, and so they may learn part of a module, and then take a quick 10 question quiz.

Another teacher states, “I’ll do remediation groups and I’ll reteach a topic and then I’ll give some exit tickets with three to four questions just to kind of check back in and see potential growth.” In addition, teachers also use written assignments in the LMS, tests, and benchmarks for summative

assessment. The assessment data are very helpful for teachers' planning and instruction. Most teachers claim that they used the formative assessment data to guide their planning decisions. The following quotes share how different teachers use the data: "I do use that data to just get a quick idea of what students need," "I use that data to form my small groups when I am forming that small groups for instruction," "If I see that a large number of students have done poorly in a certain topic, then it's definitely something that I want to readdress," "It helps me know what they really understand and what they don't," and "I use formative information a lot. So, I saw yesterday my kids were not getting what we were doing. So, I used that reality from yesterday to decide what I'm going to do today."

Time. Several teachers assert time is a key element of online instructional planning, stating that live session time is much shorter than face-to-face instruction. Online instruction is 35 minutes rather than 90 minutes. Therefore, they must use the live session time efficiently. One teacher explains:

There is also a time constraint because our live sessions are 35 minutes long. I have to get through things a lot more quickly and keep things moving and there's not as much time to do longer activities. I have to keep things really to 10 minutes or less in order to keep it moving throughout the 35 minutes.

However, teachers also observe that in online settings, they have more time to plan. This increased time is a result of ready-made content and assessments as well as shorter instruction time. One teacher shared:

I'm not teaching from 8a.m. until 3p.m. every day. I'm teaching about half of that time. And then the other half of that time I have the opportunity to do planning and to do

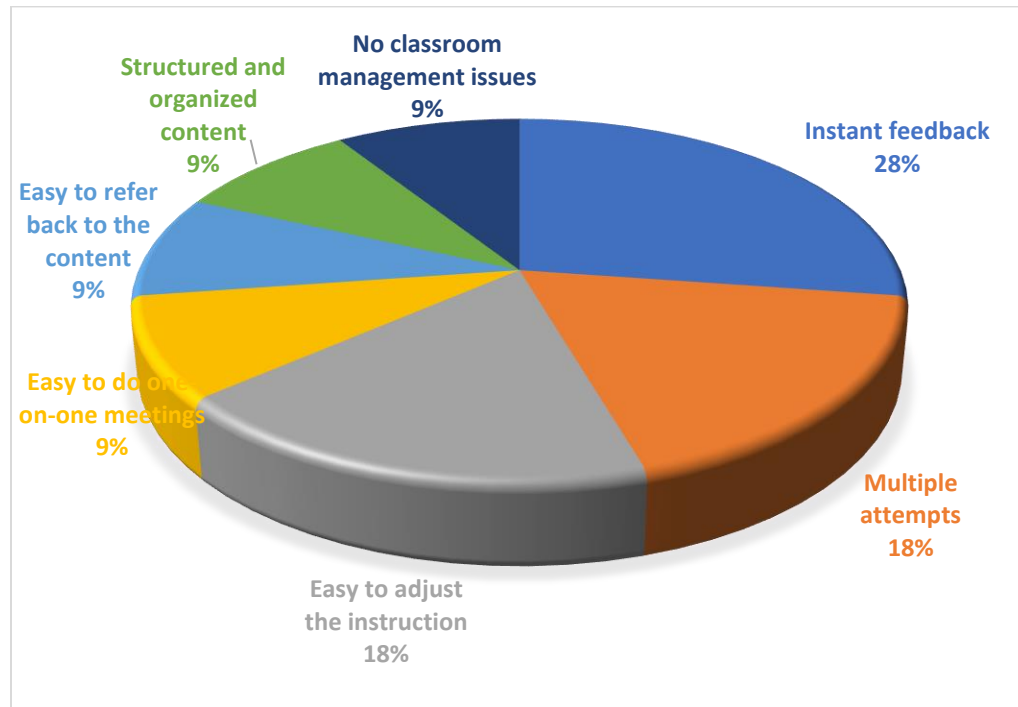
development of activities, and to meet with students. So, for me, it's much easier virtually because of how our day is structured to do it virtually.

Strengths and Challenges of Online Instruction. During the interviews, teachers also discussed the strengths inherent in and the challenges peculiar to online instruction. Strengths are mostly related to assessment, content, and classroom management while challenges are related to all the elements.

Strengths. The strengths of assessment include immediate or instant feedback about students' learning (three teachers mentioned it), easier to make adjustments in the virtual environment (two teachers mentioned it), and the ability for students to have multiple on quizzes (two teachers mentioned it). For content strengths, one teacher states that how the modules are structured and organized guides him what is to cover and what learning objectives to achieve. Another teacher states an online setting provides a place to house the content and all the information. Students can continuously refer to the content available, which is beneficial for learning. In addition, two teachers claim they do not need to worry about classroom management issues because there are no behavior issues or interruptions to worry about in an online setting. The aspects of the strengths are presented in Figure 14 below.

Figure 14

Strengths of Online Instruction Mentioned by Teacher Interviewees



Challenges. Challenges involve all the key elements: content, learners, learning activities and/or teaching strategies, learning tools and media, communication and/or interaction, assessment and/or evaluation, and engagement and time. For the content, teachers are concerned about the flexibility of the premade content, the appropriateness of the content for all levels of students, the amount of content to cover within the limited live session time, and the time spent to plan for the visual presentation. Specifically, one teacher asserts the premade content constrains her flexibility in using the content. Another feels the current course content takes up too much live session time, and that it needs to be rewritten to give more time for learners to learn asynchronously. Still another notes that the materials are the same for students at all levels, not differentiated at all. In view of this, she suggests creating content fit for students at different

levels. One teacher mentions the number of materials, stating it is difficult to cover all the learning materials in the limited time they have for class. Another stated it took longer to plan the visual presentation on google slides.

Challenges regarding learner analysis involve student age, parental support at home, identifying struggling students, students' understanding of the online learning requirements, and students' social and emotional needs. For instance, several teachers state they have no control over the home environment, which in turn might have negative effects over learning activities or learning materials needed. One teacher specifies that, even though she requested parents provide the children with a quiet learning place, she still could hear the student's sibling screaming or playing video games while the student was having live sessions. Another common issue is students' understanding of online learning requirements. Teachers feel the online classroom environment is better this year because all the students are required to turn on their videos. Prior to last year, students were not required to do so; this made it challenging to know whether students were listening and learning or doing something else.

Challenges concerning learning tools and media center on the accessibility of learning tools for both the teacher and the students, including the Internet connection, access to Google Docs, YouTube, and other Websites, and access to the physical manipulatives that students can use at home. In addition, teachers report there are limitations and restrictions in using certain tools or media because of copyright and security issues.

There are five major challenges regarding communication and interaction. The issue most teachers most often mentioned, is that some students never turn on their cameras, some do not attend the classes, and some are not very responsive. All these situations make it challenging for teachers to talk to or build relationships with them. The second issue centers on student-student

interaction. Teachers report that in live sessions, to protect students' privacy, they mostly keep the session in focus mode in which students could only see the teacher and themselves. This made communication and interaction very challenging. The third issue concerns privacy and information security. Teachers said that MASVP does not allow them to share students' information with other students. Therefore, students have very few communication and interaction opportunities with other students after live sessions; this can contribute to feelings of isolation and loneliness. The fourth issue is regarding breakout room interactions. One teacher observes that breakout room discussions are challenging because they require a lot of time, and she is not able to pop in every breakout room to check students' discussion. The fifth issue is the communication approach. Teachers state it is difficult to reach out to every student. A teacher can send individual or group emails; however, after sending the email, they do not know whether the students have opened and read the communication. Phone calls are another method of reaching out to students, but students might not pick up the phone and answer it.

The challenge most teachers reveal concerning assessment is cheating. Several teachers assert that cheating is a major problem in virtual learning because it is easier for students to cheat. Students can use the Internet to cheat or have somebody beside them to help; this leads to inflated or misleading test scores. Teachers often know which students are cheating but are unable to prevent it. Multiple teachers expressed concern over cheating: "I think cheating is a big problem virtually," "The test scores are probably incredibly inflated because of cheating," and "The only thing I do worry about is that when the students are at home taking these quizzes or doing the assignment, I don't know how much help they're getting at home." Another assessment issue is grading essay assignments because the number of students is large in virtual settings. A teacher claims, "One big challenge is grading essay assignments because of the

student number. For online, I went from having a total of 40 students. And now, I have 140. You know, at one-point last year, I think I had 200.” Other challenges included hard to collect feedback and fewer opportunities to watch students do the work. One teacher shared that “It is very difficult to get feedback or even see that the student is doing any work. Large groups make this even more difficult.”

Challenges in learning activities and/or teaching strategies are related to engagement. Teachers report that student engagement in online settings was always challenging, and they continually need to look for new ways to engage students. These difficulties make it hard to ensure students are completing their assignments and working independently.

Interestingly, teachers held opposite views on some points. For example, some teachers feel they can get instant feedback from online assessment while other teachers feel they do not get instant feedback as they did in face-to-face setting. The conflicting perspectives are based in how teachers define feedback. Those who believe it easy to get instant feedback are using the automatically graded quizzes as a reference. In contrast, teachers who feel it is hard to get instant feedback are referring to interpreting students’ body language and reactions to learning.

Similarities and Differences Between Online and Face-to-Face Instructional

Planning. Teachers report many similarities and differences between online and face-to-face instructional planning. The details of similarities and differences are presented below.

Similarities. Similarities involve the planning process and all six identified key elements, as displayed in Table 20. Similarities are mostly focusing on broad layer of planning, such as same planning foundation, same planning focus, same standards, same students with same age and same learning style, same types of learning activities, same technology use, and same types of assessments.

Differences. Ten aspects of differences are identified across the data of interview and survey responses, including lesson plans, content design, learner analysis, learning activities and/or teaching strategies, learning tools and media, communication and/or interaction, assessment and/or evaluation, time, expectation, and learning modes. Most differences emerge in content design, learner analysis, learning activities and/or teaching strategies, learning tools and media, communication and/or interaction, assessment and/or evaluation. Table 21 below provides the details and comments from educators.

Table 20*Similarities Between Face-to-Face and Online Instructional Planning*

Items	Similarities	Sample Quotes
Planning process	Same planning process	“I would say in general the planning process is still very much the same.”
Planning foundation	Same pacing and foundation	“The planning, the pacing, things like that, I should say that's the same. The foundation of that is the same.”
Planning focus	Warm-up, delivery, practice, and closeout.	“It is incredibly similar to in-person instruction. Each day I incorporate a hook/warm up, content delivery, and group/ individual work. We focus on learner-centered instruction that supports the SOLs.”
Six Key Elements	Same standard	“Lots of similarities. So, we follow the same standards. We unpack the standards we teach by skills.”
Content		
Learners	Same interest based on their age.	“I think it’s very similar in terms of how I would assist students.”
	Same learning style.	“They were kids and interested in the same type of things.”
	Same support.	“Students needed to build upon prior knowledge regardless of whether they were in the virtual classroom or face-to-face classroom. Students needed to be engaging.”
Learning activities/teaching strategies	Same small group activities Same one-on-one help Same practice opportunity	“It is very similar. We would do the same thing with small group instruction in a classroom.”
Learning tools and media	Same digital tools	“I use most of these tools in person, too.” “More similar than different.” “Nearpod is something that I use a lot face-to-face.”

Communication/ interaction	Same way of communication.	<p>“I think they’re similar in some ways because in a traditional classroom I still would have sent a newsletter.”</p> <p>“It’s similar in messaging around.”</p> <p>“It is the same. It’s just maybe more intense. Like, reaching out. I was very strong in this area in the building.”</p>
Assessment/ evaluation	Same type of assessment	“I start this portfolio assessment in an in-person classroom.”

Table 21

Differences Between Face-to-Face and Online Instructional Planning

Aspects	Face-to-Face Planning	Online Planning
Lesson Plans	<p>Formal lesson plans were required.</p> <p>More time spent on planning</p>	<p>Formal lesson plans were not required. PowerPoint presentation slides were created to replace traditional lesson plans.</p> <p>More time was spent on developing creative or enriching activities.</p>
Content Design	<p>Plan everything from scratch.</p> <p>Prepare all the suppliers and materials needed.</p> <p>Teach the content.</p>	<p>The content was premade by course writers.</p> <p>More enrichment or supplement, or clarification to the content.</p> <p>More visuals were needed to catch students’ attention.</p>
Learner Analysis	N/A	<p>Different demographics.</p> <p>Different motivations for signing up for online learning.</p> <p>Different learning needs.</p> <p>Lonely and isolated.</p>
Learning Activities & Teaching Strategies	<p>More physical and interactive.</p> <p>More hands-on activities/games.</p>	<p>Much harder and has fewer options to do hands-on activities.</p> <p>Small groups or one-on-one meetings were needed.</p> <p>More digital and computer-based</p>

	<p>Easier to see the process of students' learning.</p> <p>Easier to provide everything needed in the activities for students.</p> <p>Easy to make adjustments to what students were doing during the bulk of the day</p> <p>Too many disruptions and distractions.</p> <p>Hard to keep a consistent routine.</p> <p>More flexible and fluid.</p>	<p>Harder to see the process of students' learning.</p> <p>Harder to ensure parents prepare everything needed for the activities.</p> <p>Easy to make an adjustment during small group or one-on-one time.</p> <p>Whole group instruction.</p> <p>More time to plan and develop activities for instruction.</p>
Learning Tools and Media	<p>More hands-on materials or tools.</p> <p>More physical books or handouts.</p> <p>Fewer restrictions on using tools.</p>	<p>More digital tools were used, such as Epic, Word Wall, or Nearpod.</p> <p>Not everybody had the same access to the same tools, technology and content.</p> <p>Hard to find something that everybody can take with them.</p> <p>More technological tools are used.</p> <p>More restrictions and limitations of using digital tools and media.</p>
Communication and Interaction	<p>Easy to get to know students through casual conversations in downtime.</p> <p>Communication went so much faster between students.</p> <p>The strategy of communication was turn-and-talk.</p> <p>There were more conversations going on.</p> <p>Students knew each other; they went to school together, and it was a simple thing to turn and talk.</p>	<p>Hard to communicate with students because they would not turn on their cameras or they did not come to live sessions.</p> <p>Hard to get to know students in limited live session time.</p> <p>Much less peer interaction.</p> <p>Easier for students to disappear behind their stream.</p> <p>More phone calls and one-on-one meetings were needed.</p> <p>More accountability on students when communicating with emails.</p> <p>Much harder to communicate online, and teachers need to provide them with a comfortable learning environment.</p> <p>Students did not know each other. It's hard to get them to talk.</p> <p>Teachers needed to be more outgoing and reach out a lot more.</p> <p>Teachers needed to plan opportunities for students mindfully to interact.</p> <p>Teachers could only be in one place at one time rather than multitasking.</p>

	<p>Students could build rapport in the classroom.</p> <p>Students could easily sense each other's moods.</p> <p>Students could interact with their peers naturally.</p> <p>Teachers could easily talk to a student and still have eyes on the rest of the class.</p>	
Assessment and/or Evaluation	<p>No multiple choice and quizzes.</p> <p>Teachers created their own tests and projects.</p> <p>The teacher assessed students learning based on observation.</p> <p>Students did the assignments along with their learning.</p> <p>Easy to spot struggling students.</p> <p>Easy to make adjustments organically midstream.</p>	<p>More multiple-choice quizzes.</p> <p>Heavily rely on the scores to form small groups or one-on-one meeting.</p> <p>Easier to get instant feedback on students' understanding.</p> <p>More data or footprint online to look into.</p> <p>Hard to check students' understanding because the quizzes were automatically graded.</p> <p>Students could do the assignments before the live session learning.</p> <p>Less body language to be read. Thus, it was hard to spot struggling students.</p> <p>More time was spent grading and giving quality comments on and feedback to specific essay assignments.</p> <p>More time is spent doing formative check-ins and interactions so that students feel included and not left behind.</p> <p>More concrete data about how long a student has been in the class and what pages they clicked on, and how long they took on assessment.</p> <p>Much busier in responding, developing, adjusting, meeting the needs ways versus just getting through the material for the day.</p> <p>Hard to control the assessment environment.</p> <p>Multiple attempts are offered.</p>
Time	<p>More time is spent planning the instruction.</p>	<p>Less time spent on planning the content.</p> <p>Teachers need to use time more efficiently.</p> <p>Teachers need to balance work and life.</p>

Most teachers state they do not write formal lesson plans; instead, they create PowerPoint presentation slides mainly because of school requirements, teaching experience, and the efficiency of using a PowerPoint presentation. One teacher said he does not write formal lesson plans (plans in a document) because (1) teachers are not required to submit a formal lesson plan like in traditional schools and (2) PowerPoint presentation are a more efficient way to display his thoughts. Additionally, the time he does not spend writing formal lesson plans allows him to grade assignments, meet with struggling students, or talk to parents. Two teachers believe Google slides are formal lesson plans because they include all the components that traditional formal lesson plans include, and the content of slides aligns with most districts' requirements. Two other teachers state they have taught the same class for many years (more than 10 years in one teacher's case) and can naturally incorporate many of the same aspects in day-to-day lessons without creating a separate document. Other teachers express similar viewpoints: they are not required to; it is a waste of time; PowerPoint is more efficient. In addition, one teacher states that lesson plans should also evolve to be flexible and fit the new teaching modality.

For content design, teachers report they need to prepare everything from scratch in a face-to-face setting. In contrast, in online instruction the content is premade by the curriculum writers. Teachers only need to prepare enrichment materials and visuals.

Although teachers did not discuss students' needs in face-to-face settings, most teachers mentioned learners' diverse demographics and different reasons for learning online. They assert that some students study online because their schedules did not match that of face-to-face schools. Other students choose to study online because of social anxiety or physical disability. Each student comes to the online school for different reasons and from different districts. Many

students feel lonely and isolated in online settings because they have little communication with one another.

Learning activities and/or teaching strategies also look different in online classes. Several teachers share that, in face-to-face settings, most of the activities are hands-on or physical activities. In contrast, online learning activities are digitally based; this presents unique challenges because not every student has access to the same technology. Some teachers still use hands-on activities but must rely on students' parents to prepare the supplies or manipulatives. Teachers are not confident all parents will prepare those things for their children as required. Another difference teachers reveal is that in face-to-face settings, teachers can see how students solve a problem; however, in an online setting, teachers are not able to see a student's problem-solving process. This makes it difficult to identify struggling students.

When discussing learning tools and media, teachers share they use more hands-on tools and physical materials in face-to-face settings; in contrast, they needed more digital tools for online instruction. There are more restrictions or limitations in using digital tools or media; this presents unique challenges to online learning.

Regarding communication and/or interaction, most teachers assert it is easier to communicate and interact face to face because they see students physically. This allows teachers and students to build rapport and relationships with each other. Teachers can easily talk with students in class or during downtime; student-student interaction is easier, as well, because they can turn and talk in class and have casual conversations before or after class. In addition, teachers and students can sense each other's moods while talking. However, online learning makes both teacher-student and student-student interactions more difficult because some students will not turn on their cameras or do not attend the live sessions. When reaching out to students

through email or phone calls, teachers are unsure whether the students read the email or if they will answer the phone. Student-student interaction is also more challenging because students do not know each other, do not see each other, and have minimal contact with their peers. Even in a live session, most teachers must use focus mode to protect students' privacy. Students could only see the teacher and themselves on the screen; this means students can only interact with their peers through the chat box. Some teachers host a zoom lunch together to allow students to interact more freely. To conclude, communicating or interacting in an online setting presents numerous challenges for educators.

When discussing assessment and/or evaluation, many teachers share that in face-to-face settings, they seldom use multiple-choice quizzes, preferring to create their tests and projects. They are also able to assess students' learning through observation. This allows educators to spot struggling students quickly and make timely adjustments. Teachers also share they use more premade multiple-choice quizzes during online instruction. Teachers find it easier to track students' learning outcomes with the concrete data or footprints recorded in the quizzes. Because reading students' body language in live sessions was hard and quizzes are automatically graded, , it can be difficult to spot struggling students. In addition, adjustment of instruction often is delayed, particularly for asynchronous students, because teachers are unable to gauge student progress until the teacher receives an automatic email stating some students failed the tests. Also, teachers were much busier than just getting through the material for the day. Some teachers also assert that they need to spend more time responding, developing, adjusting, grading, and meeting student needs because they have significantly more students than in the face-to-face classroom.

Teachers also notice significant differences in the time-related aspects of online instruction. In many in-person classrooms, teachers have 90 minutes of instructional time; in

contrast, they have only 35 minutes of instructional time in online classrooms. Thus, they need to use their time with students efficiently. Planning time is also significantly different with online instructions. Most teachers feel planning online instruction is less work because the content, the assignments, and the assessments are already there. They only need to pace them out to day-to-day instruction. This provides teachers with more time to focus on developing creative and enrichment activities, to grade, or to meet with students. In face-to-face instruction, teachers plan everything from scratch, which requires significantly more time. Interestingly, one teacher holds a contrary view, stating there is more work and a larger time requirement for online lessons because she writes out the planning and then puts it into presentation mode. As a result, it takes her twice as much time as in face-to-face planning.

One aspect worth noting is that elementary teachers' thoughts are different from those of secondary teachers in three aspects: learning activities and/or teaching strategies, planning process, and assessment and/or evaluation. For instance, all three elementary teachers said they use hands-on activities as they did in the physical classroom. In the physical classroom, they prepare all the hands-on manipulatives for students; however, in virtual settings, they needed parents to prepare all these things for their children. Parental support is critical at the elementary level. The following quote supports this claim:

I think that parent support at home is really critical because, again, I only have so much reach here through a computer screen. So, we need also to have the engagement of the parents as much as possible because they're really the secondary teacher at home who is making sure that the students are following up with their work after class.

Another difference for elementary teachers is the instruction in all subjects. Therefore, they plan lessons within a team or do collective planning rather than working individually. They share

slides and activities with teammates, who can then adapt them to match their students' learning styles. One teacher explains:

We do collective planning. So, in terms of developing the slides that I share with my students, we break that work between our team. So, I make the slides for reading and share them with our team. There is another member of our team who makes the slides for math, another team member is doing that for writing and so on. We have flexibility to change anything based on our own teaching style and students.

Assessments are also very different in an online classroom. One elementary teacher from a Montessori background, highlights this difference clearly. She shares that Montessori does not give tests or quizzes in the traditional sense. Instead, teachers observe the students to see how they are completing their work, which helps them determine their mastery of the lesson. Thus, in the brick-and-mortar classroom, most of her assessment was done based on the teacher's observation. However, in a virtual setting, this teacher must rely heavily on students' scores to form learning groups because she does not have the opportunity to sit in the classroom with the students and observe them working or completing the lesson.

Recommendations for Teachers

The teachers interviewed share valuable recommendations for preservice teachers and teachers who intend to transition from face-to-face to online. Although most of the recommendations for both preservice teachers and teachers who intend to switch from face-to-face to online are similar, one point about preservice teachers was different. One teacher states she would not recommend virtual teaching to any new teacher because successful and effective virtual teaching needs various teaching strategies, tool kits, and experience. Without any experience in face-to-face teaching, preservice teachers likely will feel overwhelmed.

Additionally, with less support from the school, novice teachers would most likely turn over after working for a period of time. However, another teacher holds the opposite view, saying it would be easier for preservice teachers to teach virtually because they will not have face-to-face teaching experience to restrict them and would be able to learn everything from the beginning. Other recommendations are similar and can be divided into three domains: disposition, knowledge, and skills. The details are presented below.

Dispositions

- Be open to anything new.
- Be flexible and willing to learn new things.
- Be prepared for things not to run smoothly.
- Be mindful of the visuals and the words you are displaying.
- Be ready to spend a long-time planning for online teaching.

Knowledge

- Know when you should stop and when you should be working. Be sure to have a work-life balance.
- Understand you would not get as much interaction with students as in a face-to-face classroom.
- Know and do what makes you comfortable.

Skills

- Use a variety of activities.
- Use the same important skills.
- Make sure to learn online tools.
- Work on student engagement.
- Find ways to communicate.
- Be more creative.

- Be organized, technology savvy, efficient, and focused. Try to make the learning experience as similar as in a face-to-face setting.
- Do not rely on lectures. Instead, provide ways for students to show what they've learned.
- Keep the end goal in mind.
- Do not let technology drive your objectives.
- Use your instincts; use your gut with teaching.
- Do not just put it all into the aim of dragging and clicking things.
- Do not use it if it's not necessary.
- Get comfortable with technology and get used to changes.
- Reach out to someone who is teaching online for advice.

Integration of Quantitative and Qualitative Findings

When integrating the survey findings and the interview findings, teachers' beliefs and practices of online instructional planning appear more transparent. For example, in survey findings, the mean scores of the six identified elements' importance are all greater than 4, which indicates teachers believe all six identified elements are very-to-extremely important in their planning. The mean scores of the frequency of using these six elements is greater than 3.8, which indicates that teachers used these elements in their planning more than half of the time.

The findings of the interview support the findings from the survey. Specifically, teachers identify eight key elements in the interview. Among them, the identified six elements in this research are emphasized by most of the teachers interviewed and by teachers who responded to the survey. In addition, engagement and time are also perceived as key elements by many teachers.

In addition, in the survey, when requested to rank in order the importance of the six elements, teachers ranked them: *Content Design, Learning Activities and/or Teaching Strategies, Communication and/or Interaction, Learner Analysis, Learning Tools and Media, and Assessment and/or Evaluation*. Interview findings also partially explain this finding. Several teachers state they usually review the premade content, pacing guide, objectives, and standards when they plan their daily or module instruction. These teachers then create learning activities or enrichment materials to achieve the objectives. Thus, it is understandable that content design and learning activities and/or teaching strategies are ranked as the two most important elements.

Assessment and/or evaluation is ranked as the least important element. This is possibly the result of teachers not needing to create assignments and quizzes in their planning. With all the assignments and quizzes premade by the curriculum team, teachers did not need to create their own. What they did in planning was to look at the assignments and quizzes and make sure their instruction would cover those areas. In addition, the quizzes are graded automatically; teachers do not need to administer and grade quizzes. Instead, they use the data to pull small group or one-on-one meetings for remediation or adjust their instruction if most students get a specific question wrong.

The interview findings also support the survey findings in prioritizing the six elements among teachers at different school levels and with different years of teaching experience. For instance, the survey findings show high school teachers perceive less importance in content design than either middle school teachers or elementary school teachers. In the interview, both middle school teachers and elementary school teachers claim that the language of the pre-made content is not student friendly and needs to be reworded to ensure student understanding. This

factor might be why elementary and middle school teachers perceive content design as more important than high school teachers.

CHAPTER 5

SUMMARY, DISCUSSION, AND IMPLICATIONS

Instructional planning lays the foundation for effective instruction. Key elements help teachers prescribe what to include and focus on in planning. Online instruction differs from face-to-face instruction in many aspects, such as learning environment, learners, and communication and interaction. Teachers cannot plan online instruction the same way as face-to-face instruction. To better understand online teachers' instructional planning, this study investigated MASVP teachers' beliefs and practices in online instructional planning. MASVP is a virtual school serving students from the entire state who register in online learning. Teachers at this school are full-time online teachers. The school provides all teachers new to the school with a 3-week induction training period and regular ongoing training after they join the school. Therefore, all the teachers have received training to fulfill their roles as online teachers. The findings are summarized and presented below by research questions.

Summary of Findings

Research Question 1: How Do Elementary, Middle, and High School Teachers from MASVP Prioritize the Importance of the Six Identified Elements in Planning for Online Instruction?

This study reveals that teachers in MASVP perceive all six elements as very-to-extremely important elements in online instructional planning, with mean scores greater than 4. The six elements were prioritized in part II as follows: learning activities and/or teaching strategies, content design, communication and/or interaction, learning tools and/or media, assessment and/or evaluation, and learner analysis. The order of importance in part III was content design,

learning activities and/or teaching strategies, communication and/or interaction, learner analysis, learning tools and media, and assessment and/or evaluation. When the research is examined as a whole, it is shown that teachers prioritize content design, learning activities and/or teaching strategies, and communication and/or interaction over learning tools and media, learner analysis, and assessment and/or evaluation in planning.

Research Question 2: Is There Any Significant Difference in Elementary, Middle, and High School Teachers' Prioritization of the Six Identified Elements in Planning for Online Instruction Based on Their Years of Experience in Online Teaching?

The survey findings show no statistically significant difference among teachers with different years of teaching experience. However, there are some statistically significant differences among different school levels. Specifically, high school teachers have statistically significant differences from both middle school teachers and elementary school teachers in prioritizing content design. The mean scores of high school, middle school and elementary school teachers are 4.09, 4.62, and 4.59 respectively, indicating that high school teachers place less importance on content design than middle school teachers and elementary school teachers. In prioritizing learner analysis, high school teachers also differ significantly from elementary school teachers. The mean scores of high school and elementary school teachers are 3.94 and 4.53 respectively, indicating that high school teachers place less importance on learner analysis than elementary school teachers. There is no statistically significant difference across school levels for the other elements.

Research Question 3: How Frequently Do Elementary, Middle, and High School Teachers from MASVP Use the Six Identified Elements in Planning for Online Instruction?

The survey findings show the mean scores for learning activities and/or teaching strategies, learning tools and media, and communication and/or interaction to be all greater than 4, indicating that teachers include these three elements in their planning most of the time. The mean scores for content design, assessment and/or evaluation, and learner analysis are greater than 3, indicating that teachers include these three elements in their planning at least half of the time. In general, teachers plan content, learning activities, communication and/or interaction, learning tools and media, assessment and/or evaluation, and learners more than half of the time.

Research Question 4: Is There any Significant Difference in the Frequency with Which Elementary, Middle, and High School Teachers Use the Six Identified Elements in Planning for Online Instruction Based on Their Online Teaching Experience?

The findings of the survey reveal no statistically significant difference among teachers at different school levels and with different years of teaching experience in their frequency of using the six identified elements. This indicates that teachers at all school levels and with different years of teaching experience use these six elements similarly in their planning.

Research Question 5: What are the Beliefs and Practices of Teachers from MASVP in Planning for Online Instruction?

For online instructional planning beliefs and practices, four major themes emerge from qualitative data, including data from both interviews and responses to open-ended survey questions. The four themes include key elements, strengths and challenges, similarities and differences, and recommendations for preservice teachers and teachers who intend to transition from face-to-face to online.

Key Elements. Eight key elements are identified in this study, namely content design, learner analysis, learning activities and/or teaching strategies, learning tools and media, communication and/or interaction, assessment and/or evaluation, engagement, and time. The first six elements are aligned with those identified in Mo et al.'s (2021) systematic review. Engagement and time are two key elements newly propounded in this study.

Strengths and Challenges. Teachers identify both strengths and challenges in online instruction. Strengths mentioned include easy access to instant feedback, ease of making timely adjustments, of making multiple attempts in quizzes and getting points back, and no need to worry about classroom management. Challenges include content flexibility and material accessibility, students' social and emotional needs, student engagement, parent support, limitations and restrictions imposed by learning tools and media, communication and/or interaction issues concerning student privacy, information security, and cheating in assessment and/or evaluation.

Similarities and Differences Between Online and Face-to-Face Instructional Planning. Online instructional planning is similar to face-to-face instructional planning in several aspects, mainly focusing on planning processes and key elements. For instance, both types of planning share the same learning objectives and course standards, plan for the same teaching components (content, warm-up, delivery, practice, and the closeout), and center on students of the same age. In addition, some teachers used similar activities, learning tools, and assessment approaches.

However, more disparities than similarities exist between online instructional planning and face-to-face instructional planning, with differences also involving the planning process and key elements. Most notable differences lie in efficiency of using lesson plans, planning of

content and learning materials, easiness and challenges of conducting activities in both settings, types of and access to learning tools, easiness and challenges of communication and interaction in both settings, types of assessment and drawbacks of online assessment. Specifically, teachers claim online presentation slides are more efficient than face-to-face lesson plans. In addition, teachers feel the content online is more organized and structured, allowing more time to create enrichment activities. However, communication and/or interaction and assessment and/or evaluation are much harder in an online setting because of many issues out of teachers' control.

Recommendations for Preservice Teachers and Teachers Who Intend to Transition to Online Instruction. Recommendations for future online instructional teachers can be divided into three categories: knowledge, skills, and dispositions. Each category includes several specific suggestions. These include being efficient, focused, creative, and open to new things. Future online educators also need both organizational and technological skills and to be mindful of different learning activities and student engagement methods. These teachers need to be able to keep the end goal in mind while being prepared for things that do not go well. Ultimately, preservice teachers and teachers who intend to transition to online need to embrace the change, be prepared for new things, and be mindful of technology use, communication, and assessment issues.

Discussion of Findings

Several important findings are noted in this study. First, teachers' priorities on the importance order of the six elements might be different from the priorities of teachers who instruct in person. Second, two new elements, engagement and time, have been brought into focus in addition to the six elements identified by Mo et al. (2021). Third, online instructional planning practice shares similarities with face-to-face instructional planning practice, but also

has notable differences. Fourth, some important points have been deduced from the six identified key elements, such as advantages and disadvantages of premade content, students' social-emotional needs, useful learning activities, judicious use of technology and online ethics (e.g., copyright, information security and netiquette), challenges in student-student and teacher-parent interaction, and cheating during tests or exams. All these new or important points have been reported in Chapter 4 and will be expanded on in this chapter.

Teachers' Priorities on the Importance Order of the Six Elements

In the survey, teachers rank content design, learning activities and/or teaching strategies, and communication and/or interaction as the most important three elements. Although learning tools and media are often perceived as one of the most important factors influencing online instruction, they ranked the fourth in Part II and the fifth in Part III of the survey. Although initially surprising, this ranking can be better understood when linking teachers' backgrounds to this finding. The teachers in this study teach online courses full-time in MASVP and have received professional training both prior to teaching and during teaching. The school provides them with digital tools and media in the LMS which teachers use each day. Thus, it is likely that these teachers perceive digital learning tools and media as a second nature of instruction rather than something they need to particularly emphasize.

In contrast, in-person teachers who teach only a few online courses may need more time to select and learn digital tools and media because they do not have as many professional training opportunities or as much school support as teachers interviewed in this study. It is possible that those teachers may perceive learning tools and media as the first or the second important element among the six.

To conclude, the order of importance of the six elements is ranked by a unique group of full-time, online teachers. Caution should be taken in extending these findings to teachers who teach in a hybrid fashion or teachers who must shift to remote learning suddenly, as occurred during the Covid-19 pandemic.

Two New Key Elements

In the systematic literature review conducted by Mo et al. (2021), engagement and time were not identified as key elements. However, engagement emerged once in NSQ Course Standards, emphasizing course design should include introductory assignments or activities to engage learners within the first week of the course, and once in NSQ Teaching Standards, emphasizing teacher should design learning experiences that use technology to engage learners efficiently. Time is included in Stronge's (2007) framework. Although they were identified in these three frameworks, these two elements were not identified as key elements in any other models, standards, or frameworks. In this study, teachers emphasize these two elements based on their authentic teaching practices. To better understand teachers' beliefs and practices, these two elements are worth further discussion.

Engagement. Engagement is typically explored from emotional, behavioral, and cognitive perspectives (Chi et al., 2018; Fredricks et al., 2004). These three categories of engagement are meta-constructs of engagement applied in K-12 education, and are directly associated with students' feelings, attitudes, and perceptions toward school, teachers, and peers. Emotional engagement includes fostering interest, positive feelings, and a sense of belonging (Archambault et al., 2009; Fredricks et al., 2005). Behavioral engagement involves students attending school, participating in extracurricular activities, doing homework, following rules, adhering to classroom norms, making efforts, showing persistence, contributing to class,

concentrating, and displaying resilience (Skinner & Belmont, 1993). Cognitive engagement involves a student's proficiency in tasks, use of strategies, and pursuit of achievement to satisfy the requirements of the learning task (Greene et al., 2004).

In this study, many teachers list engagement as a major challenge in online instruction. The challenges involve all three types of engagement. For instance, teachers have found that many students who study online feel lonely and isolated, indicating they do not feel included in the learning community and are facing an emotional engagement challenge. This challenge might result in failure to respond and talk in class or to turn on their cameras (behavior engagement challenge) in live sessions. Finally, teachers find cheating in exams is also common in online settings (behavior and cognitive engagement challenge). In this sense, these three types of engagement are closely interrelated. If students feel included and supported, they will participate in learning which will lead to greater confidence when taking tests or exams.

To solve these engagement problems, teachers share their experiences in planning practice. For instance, they analyze premade learning content, choose what is most relevant and will arouse students' interests, and/or add extra relevant learning materials to engage students in learning. Based on the learning content, they design fun but relevant activities to encourage student engagement. In addition, teachers may plan a Zoom lunch together or similar activities to build teacher-student and student-student rapport, ultimately providing a supportive and inclusive learning environment. Each of these activities may help students feel comfortable in the class and confident in the learning process and exams.

Time. Teachers identify several time differences between online and face-to-face instruction: (1) instructional time difference, (2) planning time difference, and (3) working time difference. Instructional time has only 35 minutes of live session in online learning, rather than a

90-minute class for fact-to-face instruction. This difference requires teachers to use the 35-minute live session efficiently. Within this limited time, teachers can only do some explanation and enrichment for the premade content. Because teachers are not able to go through everything with students in live sessions, students often need to learn the content themselves prior to live sessions. Teachers need to plan carefully for learning activities and learning tools that explain and enrich the premade content.

The second difference in time is planning time. Most teachers claim that in MASVP, they do not need to spend as much time on planning as in face-to-face instruction because content, assignments and quizzes are premade. Instead, they have more time to plan and design learning activities, grade student assignments, and make one-on-one remediations. This viewpoint does not align with early research findings, which show that time is one of the major issues instructors face in online instruction because preparation, planning, and teaching an online class takes a significant amount of time (Capra, 2011; Fein & Logan, 2003; Humphries, 2010). Another study also shows that it takes teachers twice as long to prepare and teach online than face-to-face (Cavanaugh, 2005). Similarly, Archambault and Crippen (2009) surveyed 600 U. S. K-12 online teachers and found that the amount of time spent on online teaching workload is more than that spent on face-to-face teaching. The disparities between this study and earlier studies may result from the availability of learning materials and premade content for MASVP teachers.

Working time also looks different between in person and online instruction. Some teachers said there was more workload in online instruction. They were much busier responding to students, developing activities, adjusting instruction, meeting with students and parents rather than just getting through the material for the day. In addition, they have more workload in grading students' essays. One teacher says he had more students online than in face-to-face, so

he has much more work when grading essay assignments. He asserts teachers must know when to start to work and when to stop working. In MASVP, teachers work at home rather than at school, but early research shows that working at home using digital technologies results in longer working hours and higher work intensity (Eurofound and International Labour Office, 2017). Therefore, establishing healthy work and life balance in an online setting is essential.

Based on teachers' planning practices, engagement and time are two critical elements in online instructional planning. This study recommends adding these two elements to Mo et al.'s six elements framework to inform teachers to consider these two issues in their planning practice.

Instructional Planning Practices: Online Versus Face-to-Face

Many teachers claim they start their planning by reviewing the premade content, learning objectives, assignments, and quizzes; they then design appropriate learning activities. Some teachers use backward mapping and start from learning objectives to design learning activities. Although there is no early research focusing on teachers' prioritizing of the six elements, some studies have examined the sequence of using planning elements to develop instruction. Some researchers find variation in the sequence in which teachers use planning elements. For instance, Taylor's investigation (1970) finds that secondary teachers ranked students' learning needs, abilities, and interests first, followed by the content to be taught, learning goals, and teaching methods. Contrastingly, many other researchers find teachers start their planning with content. For instance, Clark and Yinger (1977) suggest teachers first "specify objectives," then "select learning activities," then "organize learning activities," and then "specify evaluation activities" (p. 280). Zahorik (1975) states that most of the teachers who participated in his study began planning by content and learning objectives. In another study, teachers report they spend most of

their time pondering the content to be taught, followed by instructional strategies and activities, and the least time focused on learning objectives (Peterson et al., 1978).

The findings of this study align well with these early findings; this implies that solid understanding of learning content and learning objectives is foundational to creating learning activities. Teachers need to fully understand content and learning objectives prior to creating appropriate learning activities to help students achieve academic success. In this sense, backward mapping is an appropriate way to guide teachers in planning.

The findings also show that lesson plans in face-to-face and online settings are different in form. Most teachers who participated in this study report that they do not write traditional lesson plans (a separate word document); instead, they made presentation slides. In this aspect, there is no difference between teachers at different school levels and with different years of teaching experiences. This is inconsistent with traditional face-to-face instructional planning. Previous research shows that, in face-to-face instruction, experienced teachers plan instructions differently from novice teachers (McCutcheon, 1980; Yinger, 1980; Zahorik, 1975). Experienced teachers are more adept at mental planning. Some experienced teachers may not write down lesson plans at all (McCutcheon, 1980). They have objectives and structures in mind (Reiser & Mory, 1991), and allow flexible agenda such as sequences of activities, general goals, alternative strategies, and routines (Leinhardt, 1983). Shaw (2017) queried three experienced high school music teachers about their lesson planning practice and found that experienced teachers preferred a personal style of planning, including typing up plans, writing notes in scores, and thinking through the plan without any written artifacts. They may think of teaching at any time; reflect on what was taught and make connections between what was taught with what will be taught; they make multi-layered considerations in planning, including short-, medium-, and long-term

considerations. Experienced teachers felt that novice teachers have more challenges deciding what to prioritize and how to respond if the planned strategies did not work; and so, they need to plan more content and strategies than needed.

However, teachers in this study reported that they did not write down lesson plans in a separate word document; however, they all made presentation slides whether they were veterans or novices. This difference may stem from different learning environments. In face-to-face, teachers can attract student attention through hands-on activities and direct interactions, thus they just need to write the activities in the lesson plan rather than presentation slides; however, in online settings, teachers need to use presentation slides to catch student attention and help them better understand the learning content. Whatever the form of lesson plans used, teachers should use what is efficient and beneficial to them and their students. To conclude, in planning face-to-face instruction, experienced teachers plan lessons differently from novice teachers. They are more flexible about the mode, the content, and the time boundary of planning. In planning online instruction, experienced teachers plan lessons in similar ways to novice teachers. They all make presentation slides rather than writing lesson plans in separate word documents. They use whatever form of lesson plan best serves their instruction.

Other Important Points that Emerged in the Six Identified Elements

Pre-Made Content. In MASVP, premade content has both advantages and disadvantages. Most teachers interviewed in this study commend the premade content for being well organized and structured, and therefore user-friendly and time-saving. Consequently, teachers could spend more time creating learning activities, preparing enrichment, grading assignments, and talking to individual students or parents. Premade content can also ensure

consistency among teachers. More importantly, organized and structured content is more engaging and easier for students to learn.

Several other points regarding content are consistent with previous research. For instance, teachers suggest that content needs to be connected to the real world. Early research shows that connecting course content to students' experiences and interests is one evidence-based strategy to increase student engagement in both face-to-face and online K–12 education (Johnson et al., 2022). In other studies, students report the relevance of their learning to real-life situations and their own experiences could impact their engagement with course content and enhance their learning outcomes (Breiner et al., 2012; Johnson, 2013; Rennie et al., 2012; Roehrig et al., 2012).

On the other hand, premade content has some disadvantages. For instance, some teachers remark that they do not have the flexibility to use or not use the premade content, and that it is hard to meet the needs of students at different levels because the content is geared towards only one level. This finding confirms early research. Archambault and Crippen (2009) queried 600 U.S. K-12 online teachers, many of whom claimed often content is created by content designers or curriculum specialists, making it hard to control the source of the content, the organizing or sequencing of the content, and the evaluation of the content.

Another issue teachers mention is the language of the content. Some teachers observe that the language of the content is hard for students to understand. Therefore, in their planning process, they needed to use more easily intelligible language to make the content learner-friendly. Language issues are not explicitly discussed in the early research. However, clarity of content and ease of navigation are stressed in the literature. For instance, Clark and Mayer (2016) suggest that through intentionally-organized content and clear navigation, teachers could

reduce students' cognitive load in learning. Quality Matters (2019) also stresses that an online course should include specific and explicit directions on navigation to the learning platform and tools employed by the course and ways to engage students. In addition, teachers need to make clear instructions on how to engage students with content (Dikkers, 2018; DiPietro et al., 2008). Therefore, the language of the content and the navigation need to be clear and understandable.

Isolated Learners. The findings of this study reveal that students register in online learning for different reasons or motivations. Some choose to learn online because their schedule does not match the physical schools. Some students have mental or physical problems, such as society anxiety or a physical disability, which makes it difficult for them to function in physical school settings. Still others have family problems. For instance, some students have to stay at home taking care of their siblings so that their parents can work. Because these students come from different districts throughout the state and do not know or see their peers, many of them feel lonely and isolated. This finding is consistent with previous research. Janes et al. (2004) found that one major weakness of online learning is lack of personal contact with teachers and classmates, which makes students isolated at home and distracted by other things such as computer games. All these scenarios make online instruction challenging.

To build rapport and make students feel comfortable in the learning environment, teachers can make casual conversations and create connections with students by sharing personal interests or experiences with students (Johnson et al., 2022). These are things MASVP teachers do to nurture rapport with students. For instance, one of the teachers interviewed shared his travel experience with students. Another shares her pet's pictures with students, which interested students so much that they often asked for updates on the pet. To make students feel included

and connected in the community, two of the 15 teachers went so far as to schedule time for Zoom lunch together to get students to converse and connect with one another.

Gamified Activities and One-on-One Remediation. The learning activities and/or teaching strategies teachers mentioned in this study vary at different school levels and in different subject areas. For instance, language teachers utilize role play and repetition, science teachers employed labs and demonstrations, and art teachers used step-by-step guides. Elementary teachers prefer hands-on activities while secondary teachers favor more project-based activities. In general, the activities mentioned by most teachers are gamified activities and one-on-one meetings.

Gamified activities are used by all teachers regularly, which is not surprising given that gamification activities may support and enhance more successful online learning (Bovermann et al., 2018). Students can master and comprehend the content thanks to the fun games; additionally, the social interaction may help these students obtain a greater sense of well-being (Koster, 2013; McGonigal, 2011; Seligman, 2012).

One-on-one meetings are another vital teaching strategy most teachers mentioned during the interviews. These teachers state they have set up one-on-one meetings for remediation or individualized support when they spot struggling students. This finding corroborates early research findings: one-on-one meetings are an effective instructional strategy, which could enable teachers to differentiate and personalize instruction effectively because it is tailored to meet each student's individual needs (Corry & Carlson-Bancroft, 2014). In addition, during one-on-one interactions, teachers can work with individual students to correct misconceptions and master the content (Bergmann & Sams, 2012).

Technology Use and Online Ethics. Early research on technology use in online education mainly focuses on the effects of computers, the Internet, and software (Bulman & Fairlie, 2016). Teachers interviewed in this study support this finding but reveal some gaps in using technology. Specifically, teachers mention technology gaps in devices and internet accessibility. Some teachers share that not all students have good computers, stable internet, or access to certain software. This technology gap or digital divide signifies an opportunity gap between those with and without access to the devices and connectivity necessary to learn online (Crossland et al., 2018; Dolan, 2016; Wladis et al., 2016). The issue of technology and internet accessibility is a basic consideration for online instruction. Researchers find that access to computers and the Internet affect how group work is structured, and course content is delivered (Barbour et al., 2020). In addition, student socioeconomic status, school district resources, teacher tech savvy, and infrastructure considerations such as internet speed and firewalls within schools are also important factors that affect student performance in online learning (Dolan, 2016; Gallagher et al., 2019; Yu et al., 2018).

Although many teachers in this study believe technology plays a vital role in online instruction, some regard it as just a bridge to bring quality content and teaching to students rather than a replacement for instruction. Teachers suggest using technology as appropriate, taking into account learning content, objectives, and teacher's knowledge of the technology and integrating it into pedagogy to serve the learning objectives. They assert technology should not be used when it is unnecessary or when the teacher feels uncomfortable or unconfident about using the technology. These findings bear out early research findings. Previous researchers show that technology is an essential factor in online teaching, not confined to hardware, add-on activities, or fancy worksheets (Hadley & Sheingold, 1993), but conducive to better pedagogy. Specific

technology tools should be incorporated for the purposes of facilitating collaboration and students' self-directed learning (Drexler, 2018). Teachers' confidence and comfort in using technology effectively are critical (Johnson et al., 2016). When teachers feel incompetent in using technology, they may feel less in control of the class (Hughes, 2005). Therefore, when selecting technology, teachers should choose what they are comfortable with and integrate it into the pedagogy.

Students' confidence in using technology is also important. When using new technology, teachers need to scaffold instruction to ensure students know how to use it. One teacher shares how she spends time walking students through the details of using technology at the beginning of a course. These findings are also consistent with previous studies. Teachers should understand how technology tools can be used by students and carefully scaffold students' use of technology tools to ensure that they meet the goal (Lock et al., 2017). To reiterate, technology tools or media are just tools that are used to facilitate student learning. Teachers need to use them wisely and efficiently. To reach this goal, teachers should be familiar with the tools or media, and ensure that students are able to use them effectively.

Some important issues are revealed regarding using technological tools and media, such as copyright, information security, and netiquette. Teachers reported that in MASVP they have restrictions using certain technological tools (e.g., YouTube videos) because of the copyright issue. Additionally, they are not allowed to use tools or media that require students to open an account or share their information due to privacy and security concerns. In addition, netiquette is also a concern of teachers. One teacher reports when she had students interact in the chat box, she must always keep an eye on it to ensure that the language is appropriate. These concerns all affect how teachers plan for and instruct in an online environment.

Ethical concerns are something each teacher must consider when planning for online instruction. According to the Code of Ethics, some of the general moral imperatives are honoring copyrights, respecting the privacy of others, honoring confidentiality, and avoiding harm to others (Association for Computing Machinery, 2018). Copyright is a type of intellectual property that protects original works of authorship for the author (Copyright.gov, n.d.). The Code of Ethics states that people should honor property rights such as copyrights and patents. Therefore, when using technological tools and media, teachers need to be mindful of the copyright of the tools. Respecting the privacy of others and honoring confidentiality entails not sharing students' information with others and not using tools or media that require students to open an account. Avoiding harm to others is part of netiquette. Netiquette deals with notions of respect, harmony and tolerance, often manifested in the tone or function of the interactions (Brown, 2001; Curtis & Lawson, 2001). To maintain good netiquette, teachers should define netiquette expectations and consequences of breach (Mintu-Wimsatt et al., 2010), and include the netiquette in the syllabus to emphasize the importance of good online learning environment at the start of a course (Ragan, 2007). MASVP has keen concerns about online ethics. Not surprisingly, teachers feel there are a lot of restrictions in using technological tools and media. To maintain ethical practices in an online classroom, teachers need to abide by and support MASVP's regulations.

Student-Student Interaction and Teacher-Parent Interaction. Communication and/or interaction is one of the most significant factors for successful online learning (Bolliger, 2004). Online learning interaction involves learner-instructor interaction, learner-content interaction, and learner-learner interaction (Moore, 1989) and learner-interface interaction (Hillman et al., 1994). Online learning research shows that the first three types of interactions are the foundation

of deeper learning in an online setting and can help students create greater feelings of connectedness and belonging (Dijkers, 2018; Thormann & Fidalgo, 2014).

Teachers interviewed in this study stress the challenges of teacher-student, student-student, and teacher-parent interaction. They comment that communication and/or interaction in online instruction is challenging. For teacher-student interactions, they use emails, phone calls, live sessions, chat boxes, newsletters, and tools built-in learning management systems to communicate with students. However, communication and/or interaction online does not always go smoothly. Even in live sessions, some students turn off their cameras or do not respond at all, making communication and interaction difficult.

Student-student interaction is also challenging in an online learning environment. In MASVP, teachers are not allowed to share students' contact information with other students due to privacy and security concerns. Without their peers' contact information, students cannot interact with one another after the live sessions. Even in live sessions, teachers find some students seldom talk or respond. Breakout room discussion is helpful but time-consuming. Within the limited time, teachers cannot pop into every room to check communication and interaction among students. This finding lends partial support to early research, which shows that, in online classrooms, there is little-to-no interaction among learners beyond surface email exchanges, discussion board postings, and the occasional online chat (Sharp & Huett, 2006). Another study also reveals that online education has rarely included learner-learner interactions because in learner-learner interaction, issues such as internet bullying and cheating; there is also a tension between meeting students' individual needs and working within the time demands associated with collaborative learning (Barbour, 2007; Borup, 2016).

These findings imply a lack of community. As mentioned earlier, students feel lonely and isolated in online learning settings. Teachers need to design positive learning experiences and a safe learning environment to promote student-student interaction (Moller, 1998). Well-designed interaction should create a dialogue or conversation within a community of learners (Huett et al., 2004). Some teachers interviewed claim students are able to interact on a group page when students are organized for in group work. Therefore, group work could be an optimized approach to promote student-student interaction. Early research also shows that online peer work groups and learning communities can increase student engagement in the learning process (Holder & Moller, 2003). Therefore, research supports the idea that teachers could organize more group projects or group work to promote student-student interaction.

Teacher-parent interaction, though not included in the previous interaction frameworks, has been stressed by many teachers interviewed in this study. In online learning settings, teachers need to communicate with parents about student progress, classroom goals, and other issues. They need support from parents in many respects but are not always able to gain the support students need. For instance, online learning requires parents to provide a quiet learning environment for students. However, teachers mention they still can hear the student's siblings screaming or playing video games beside the student in live sessions. Elementary teachers share they often need course supplies or manipulatives to support students learning. Parents must prepare all these things for their child or children, but not all parents do what is needed. Teachers and parents should cooperate to ensure the students are engaging in learning. When a teacher spots struggling students, they need to communicate with parents in hopes that they would check and monitor their children's learning at home. Similarly, when parents find their child has difficulty learning, they also need to communicate with teachers and obtain support from

teachers. Effective teacher-parent communication and interaction is another key to successful online learning.

A plethora of research has found that parent support is crucial for K-12 online learning, particularly for students in grades K–8 (Barbour, 2018; Borup, 2016; Curtis & Werth, 2015; Liu et al., 2010; Oviatt et al., 2018; Roblyer et al., 2008). Parents play the roles of monitor, mentor, and motivator for K-12 students who are learning online (Carter et al., 2020; Curtis & Werth, 2015). Parents' involvement can leverage K-12 students' engagement and success in an online environment (Borup et al., 2015; Curtis, 2013; Curtis & Werth, 2015; Stevens & Borup, 2015). However, as many parents have limited experience with online learning and use of technology (Carter et al., 2020; Curtis & Werth, 2015), teachers must communicate or interact with parents through effective communication channels (e.g., email, and phone calls), explaining expectations for students' home learning environments and expectations of support for students learning at home (Ricker et al., 2021).

Cheating on Tests or Exams. Assessment is vital for understanding student progress and guiding instructional plans in K–12 online education settings (Heppleston et al., 2011; Sheard & Chambers, 2014; Turley & Graham, 2019). Typically, teachers use both formative and summative assessments because these two types of assessment aim to provide feedback or data about student understanding and mastery of content (Black, 2018; Furtak et al., 2016; Sondergeld et al., 2016).

The findings of this study reveal that the most frequently used formative assessment approaches include quizzes, assignments in the LMS, quick checks, and exit tickets. Teachers can obtain immediate feedback through these approaches. This supports research done by

Heppleston et al. (2011), who also found that using technology tools can generate immediate feedback on student learning. This allows teachers to adjust their instruction in a timely manner.

For summative assessment, several teachers mention cheating on the test or exams. Teachers often can tell whether students are cheating or not; however, it is challenging to prevent this dishonesty. Researchers have found that cheating online is more convenient than in a traditional offline exam (Noorbehbahani et al., 2022). Teachers share that students can use the Internet or have someone sitting beside them to help them. Student dishonesty inflates grades and misleads instruction and is therefore a critical issue in online education.

Students have many motivations for cheating. Noorbehbahani et al. (2022) conducted a systematic review of 58 publications from 2010 to 2022 and synthesized four categories of reasons for cheating, including teacher-related, institutional-related, internal, and environmental reasons. Each category has several specific motivations. For instance, teacher-related motivations include unfair favoring of bribers over non-bribers, low interest in students' learning and behavior, teachers' poor pedagogical styles, course difficulty, lack of support when students immediately need it, restraint of professors to punish cheaters, poorly designed exams and easy availability of solutions and lack of connection between course materials and exams. To reduce cheating, teachers need to analyze why students cheat. If the reasons are attributable to teachers, the teacher has the responsibility to improve the situation accordingly. If a student's motivation for cheating is an internal reason, teachers need to talk with the student and provide necessary support or help with the student's learning.

Implications for Leadership and Teacher Practice

Based on the tentative findings of this study, some implications concerning leadership and teacher practice are proposed as follows.

Leadership

Include Teachers' Voices in Decision-Making. Teachers report several issues related to leadership. For instance, teachers claim that premade content is inflexible to use, that the language of the content is challenging for some students to understand, and that there are restrictions in using some resources and technological tools. These findings provide school administrators with the voice of front-line teachers. To better serve the teachers and improve online teaching effectiveness, school administrators should build a path for teachers to express their thoughts. Teachers' voices then should be included in the content design process and decision-making process of selecting resources and technology tools. Additionally, school administrators could include some frontline teachers in the course writer or designer team.

Design Professional Development Programs Based on Teachers' Feedback. For challenges teachers are facing, such as student engagement, student-student interactions, and student social emotional issues, school administrators have responsibility to provide teachers with series of professional development (PD) opportunities and help teachers improve their expertise in these aspects to a sufficient level, boosting confidence in the process, training, and supporting teachers (Johnson et al., 2016). Professional development is a common program that school administrators use to support teachers. However, research shows that most training programs "typically focus on technology, pedagogy, and course content" (Mohr & Shelton, 2017, p.134). Such one-size-fit-all professional development is usually too general to be relevant to the teachers' needs (Leary et al., 2020). School administrators need to hear teachers' voice, collect teachers' feedback, understand teachers' learning needs, and embed PD programs in teachers' needs and best practice.

Teacher Practice

Be Prepared for Online Instruction. Teachers interviewed in this study suggest that new teachers be open to new things, ready for changes, and be technology savvy. They must also be efficient, organized, and creative. This indicates that teachers need to be prepared in three domains: disposition, knowledge, and skills. First, teachers need to embrace this new normal teaching modality, know the benefits of online instruction, and be willing to learn online teaching expertise and skills. Second, teachers need to be familiar with the differences between online instruction and face-to-face instruction as well as the strengths and challenges of online instruction. Third, teachers need to possess instructional competencies unique to online instruction through professional development opportunities provided by school and other learning opportunities.

Build Professional Learning Communities. Teachers also recommend that new teachers talk to experienced teachers prior to teaching online. Learning from peers is beneficial because experienced teachers can share their best teaching practices in authentic online instruction and inform new teachers about pitfalls and solutions to some common problems. Teachers will have greater success when they build a professional learning community (PLC), an environment in which individuals are continuously learning and responding to one another (Leary et al., 2020). PLC benefits teachers insofar as they can share their creativity and critical thinking to produce optimal approaches to teaching (Mustapha et al., 2021). Through building a PLC, new and experienced teachers alike could share their insights, experiences or scenarios, and post problems they encounter. This allows teachers to respond to questions and problems and learn from each other.

Make Their Voice Heard. When confronted with challenges, teachers could turn to administrators to expose the challenges and provide their solutions to the issues. For instance, when hampered by accessibility issues, such as limitations or restrictions of using some specific technology or media, teachers could turn to administrators for alternative equivalent technology or better ways to solve the problem.

Keep Learning and Reflecting on Their Teaching. Teachers can also learn from themselves through reflecting on their own teaching. For instance, though students are unable to interact with others very well on account of security and privacy concerns, they can access group web pages and discussion boards. To this end, teachers could design or organize more group projects and discussion threads for students to collaborate on or work with (Johnson et al., 2022). Teachers could also devise more creative activities (e.g., zoom lunch together) to help students build rapport and involve them in communication and interaction based on their own experience.

In addition, to prevent or reduce cheating in the assessment, teachers need to find the primary causes that directly or indirectly drive students to cheat. If the causes relate to teachers, such as teachers' unethical behaviors, poor pedagogical style, or course difficulty, teachers need to reflect on their behaviors and instruction to improve it. In the case of cheating caused by student-related factors, such as lack of learning and skills to find resources, inability to seek appropriate help, or poor time management (Dobrovskaya, 2017), teachers are duty-bound to provide timely support or assistance. If the cause concerns institution policy or rules, talk to administrators to find ways to improve them. For instance, the exam designers could design cheat-resistant exams (Johnson et al., 2016), implement honor systems to help build a healthy and ethical environment and instill academic integrity and morality ideals (Korman, 2010), and

do impersonation prevention before examinations, such as checking the school I.D. badges or government-issued I.D. by the webcam (Moten et al., 2013).

Implications for Research

This study explored online teachers' instructional planning, specifically the planning elements, teachers' prioritizing of the elements, frequency of using the elements, and their beliefs and practices in using these elements. With a rapidly growing number of schools and students adopting online learning, particularly during and after the COVID-19 pandemic, online instruction is becoming the new normal modality. The effectiveness of online instruction is becoming an important research focus. As a logical first step, instructional planning lays the foundation for effective teaching (Stronge, 2018). A plethora of research has shed light on online instructional planning, including the instructional plan process (Gyabak et al. (2015), instructional planning framework (Southern, 2022), instructional planning model (Almekhlafi, 2020; Wang, 2021), specific aspects, such as technology tools used in online instruction (Arslan, 2020; Barbour & Adelstein, 2013), and specific key elements of online instructional planning (Mo et al., 2021). However, there is no empirical research directly focusing on the importance of key elements and how teachers use them in their online instructional planning, and teachers' beliefs and practices of online instructional planning.

This study utilizes quantitative survey data to draw a general picture of how MASVP teachers prioritize the importance of the six identified key elements and the frequencies with which they use them in their planning practice. Qualitative interview data is used to explain the survey findings and reveal teachers' planning beliefs and practices. In particular, the participants of this study are all full-time professional online teachers who have received professional training prior to and during online instruction. These features distinguish this study from existing

research, which focuses primarily on general planning processes, only one element of planning, or in-person teachers who do not teach in virtual schools. Although it is premature to claim that this study fills the gap existing in online instructional planning research, the findings of this study contribute to a better understanding of online instructional planning.

The survey questions and interview protocol of this study focus on teachers' beliefs and practices concerning the six identified elements in online instructional planning. Through querying and interviewing MASVP teachers, this study examines teachers' beliefs and practices concerning the six identified elements. These beliefs and practices are grounded in the existing literature and build a composite of the concept of online learning planning. For instance, the findings of this study reveal that student engagement, communication and/or interactions, and assessment and/or evaluation are more difficult in online instruction than in face-to-face classrooms which supplement and confirm earlier research.

As reflected in this study, research on the key elements, beliefs, and practices of online instructional planning is crucial to better understanding of online instructional planning. To draw a more comprehensive picture of online instructional planning, future studies should investigate teachers in more virtual schools, and in-person teachers who teach online programs in non-virtual schools. In addition, future studies could use class observation and review artifacts (teaching materials) to delve deeper and better understand instructional planning. In particular, solutions to the challenges need to be explored and sought, such as solutions to effective learner-learner interactions and solutions to cheating in the assessment.

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Appendix A

Email Text

Dear Teacher,

Online instruction is commonly used in K-12 schools. However, there is little research that sheds light directly on teachers' planning practice, your professional experiences of instructional planning are critical for me to build on this topic. This email is a pre-study announcement that invites you to participate in this important topic. In the following week, I will send you a Qualtrics survey link which consists of five parts: Demographic information, Importance of Using Planning Elements, Priority Ordering of Planning Elements, Frequency in Using Selected Planning Elements, and What Else Can You Share About Planning for Online Instruction? The survey should take you about 15 minutes to finish.

This study is approved by the Institution Review Board at the College of William & Mary. As the investigator of this study, as well as a PhD student, I would thank you in advance for your contribution to this study. Your name, institution, and any other potential identification information will not be shared nor reported in any part of the study. All data will be reported out in aggregated and anonymous manner. I collect personal information for possible opportunities to connect with you as to follow-up with requests for an interview to make sense of your experiences as a K-12 online classroom teacher. Hence, I will do everything in my ability to protect your confidentiality. If you are willing to provide me with more information about your planning experience, please allow me to reach out to you by checking the option at the end of the survey for a follow-up interview. I thank you again for being generous of your time and your devotion to such an important topic.

Sincerely,

Yanping Mo
PhD Student in Educational Policy, Planning, and Leadership,
School of Education, College of William & Mary

Appendix B

Survey Instrument

ONLINE TEACHER SURVEY

Part I Demographic Information

Please indicate the total number of years that you have worked in online teaching.

- _____ a. Years teaching Mid-Atlantic State Virtual Program
_____ b. Years teaching with primary responsibility for online teaching prior to joining Mid-Atlantic State Virtual Program
_____ TOTAL years in online teaching (combine a. and b. above)

Which of the following best describes the school level in which you currently and primarily work?

- _____ Elementary school
_____ Middle school
_____ High school

Do your teaching responsibilities overlap across teaching levels? For example, do you teach high school courses to middle school students?

- _____ Yes
_____ No

If yes, describe the overlap below:

Please indicate your gender.

- _____ Male
_____ Female
_____ Non-binary
_____ Prefer not to respond

Part II Importance of Using Planning Elements

1. **Content design** in this study includes but not limited to setting the instructional objectives, selecting learning materials and resources, chunking, and sequencing the learning content. How important is including **content design** in your instructional planning?
☐ 1 Not at all important ☐ 2 Somewhat important
☐ 3 Important ☐ 4 Very important ☐ 5 Extremely important
2. **Learner analysis** in this study involves the analysis of students' cognitive level, personalities, learning preferences, students' technology accessibility, and digital literacy. How important is including **learner analysis** in your instructional planning?
☐ 1 Not at all important ☐ 2 Somewhat important
☐ 3 Important ☐ 4 Very important ☐ 5 Extremely important
3. **Learning activities and/or teaching strategies** in this study include but not limited to tutorials; Web Conferences; Online Forums; Virtual Collaborative Workspaces; Simulations; Goal-based Scenarios, and active learning through lecture video presentations; recent new

articles and videos; guest speakers' synchronous chat, authentic projects, and problem-solving situations. How important is including **learning activities and/or teaching strategies** in your instructional planning?

- ☐ 1 Not at all important ☐ 2 Somewhat important
☐ 3 Important ☐ 4 Very important ☐ 5 Extremely important

4. **Learning tools and/or media** in this study include but not limited to multimedia, software/Apps, cloud computing, and LMS. How important is including **learning tools and/or media** in your instructional planning?

- ☐ 1 Not at all important ☐ 2 Somewhat important
☐ 3 Important ☐ 4 Very important ☐ 5 Extremely important

5. **Communication** in this study includes asynchronous written communication and synchronous audiovisual communication. **Interactions** can be learner-instructor interaction, learner-content interaction, learner-learner interactions, and learner-interface interaction. How important is including **communication and/or interaction** in your instructional planning?

- ☐ 1 Not at all important ☐ 2 Somewhat important
☐ 3 Important ☐ 4 Very important ☐ 5 Extremely important

6. **Evaluation and/or assessment** in this study can be summative assessment including individual works, group works, tests, paper, oral or written tests conducted in the instructor's presence through videoconferencing, and formative assessment such as cognitive assessment, performance assessment, and portfolio assessment. How important is including **evaluation and/or assessment** in your instructional planning?

- ☐ 1 Not at all important ☐ 2 Somewhat important
☐ 3 Important ☐ 4 Very important ☐ 5 Extremely important

Part III Priority Ordering of Planning Elements

Based on your knowledge and experience, please rank the following six elements from 1-6 in order of the importance in online instructional planning. (1= most important and 6=least important). Please use a forced-choice among the six elements – i.e., no ties for any ranking.

- _____ content design
_____ learner analysis
_____ learning activities and /or teaching strategies
_____ learning tools and media
_____ communication and interaction
_____ evaluation and assessment

Part IV Frequency in Using Selected Planning Elements

1. How often do you use **content design** in your planning?

- ☐ 1 never
☐ 2 sometimes
☐ 3 Half of the time

- ☐ 4 Most of the time
- ☐ 5 always

2. How often do you use **learner analysis** in your planning?

- ☐ 1 never
- ☐ 2 sometimes
- ☐ 3 Half of the time
- ☐ 4 Most of the time
- ☐ 5 always

3. How often do you use **learning activities and/or teaching strategies** in your planning?

- ☐ 1 never
- ☐ 2 sometimes
- ☐ 3 Half of the time
- ☐ 4 Most of the time
- ☐ 5 always

4. How often do you use **learning tools and media** in your planning?

- ☐ 1 never
- ☐ 2 sometimes
- ☐ 3 Half of the time
- ☐ 4 Most of the time
- ☐ 5 always

5. How often do you use **communication and interaction** in your planning?

- ☐ 1 never
- ☐ 2 sometimes
- ☐ 3 Half of the time
- ☐ 4 Most of the time
- ☐ 5 always

6. How often do you use **evaluation and /or assessment** in your planning?

- ☐ 1 never
- ☐ 2 sometimes
- ☐ 3 Half of the time
- ☐ 4 Most of the time
- ☐ 5 always

Part V What Else Can You Share About Planning for Online Instruction?

Please share your thoughts below about any additional details that you think would help me understand more about your planning process for online instruction.

Are there any elements that you use in planning for online instruction that are not included in the six elements addressed in the survey? If so, please describe them.

—
—
If there are challenges that are unique to planning for online instruction, processes you use to deal with the challenges, or any other information that you think would be helpful for me to know, please comment on these below.

—
—
—
—
In addition to the survey, please indicate if you are willing to participate in a Zoom interview and share one sample of your lesson plans with me. The interview likely will take approximately 45 minutes and will be scheduled at your convenience. Please know that your participation in the interview and sharing one of your lesson plans will be confidential and will help me better understand how teachers plan for online instruction.

☐ Yes, I am willing to participate in an interview (through video conference) and provide one of my online teaching lesson plans. Add your name and email address for follow-up:

—
☐ I do not wish to be contacted by the researcher beyond the completion of this survey.

Thank you very much for the completion of the survey! For any additional comments or questions, please send an email to me, Yanping Mo (yym@wm.edu).

Appendix C

Interview Protocol: Online Instructional Planning

Time of interview:

Date:

Place:

Interviewer:

Interviewee:

Position of interviewee:

This study is to explore online teachers' instructional planning, especially about the planning elements, priorities, frequency of using these elements, and their beliefs and practices of planning for online instruction.

Questions:

1. I am interested in learning about your instructional planning process in preparing for teaching in the online environment.
<ul style="list-style-type: none">• Please share how you go about planning for daily instruction.<ul style="list-style-type: none">◆ What resources do you consult?◆ What information do you use?• How do you go about more long-range planning, such as for a unit of instruction?• How is this process different from and similar to planning for face-to-face instruction?
2. Of the elements in the process you explained, what elements do you identify as key elements in online instructional planning?
<ul style="list-style-type: none">• What makes these elements key to the process?
3. How do you go about understanding your students' needs in order to plan for online instruction?
<ul style="list-style-type: none">• How do you use this information in the planning process?• How is this process different from and similar to from face-to-face learning content?
4. What learning activities or teaching strategies do you most rely on to engage students in an online environment?
<ul style="list-style-type: none">• What impacts your decisions in selecting learning activities or teaching strategies?• How is this process different from and similar to from face-to-face learning content?
5. What learning tools or media do you most rely on to engage students in the online environment?

<ul style="list-style-type: none"> • What impacts your decisions in selecting learning activities or teaching strategies? • How is this process different from and similar to from face-to-face learning content?
6. How do you integrate digital technology into your pedagogy?
<ul style="list-style-type: none"> • What is the role of digital technology in your online teaching? • Could you describe an example in which you integrated digital technology into your pedagogy successfully?
7. What approaches and tools do you most rely on to facilitate communication and interaction in the online environment? This communication and interaction may include teacher to student, student to teacher, and student to student. How important are the communication and interaction in online instruction?
<ul style="list-style-type: none"> • What impacts your decisions in selecting approaches and tools to facilitate communication and interactions in the online environment? • How is this process different from and similar to from face-to-face learning content? •
8. What tools or techniques do you use to assess students' learning outcomes in online learning?
<ul style="list-style-type: none"> • What tools or techniques do you use on a daily basis? At the end of an instructional unit? • How do you use assessment data to help you with your instruction planning? • What impacts your decisions in selecting the tools or techniques for assessing student learning? • How is this process different from and similar to from face-to-face learning content?
9. What recommendations do you have for preparing preservice teachers for planning for online instruction? What recommendations do you have for teachers who transition from teaching face to face to teaching online?

Thank you for participating in my interview! I will do everything to protect your name and other identity information confidential

Appendix D

Consent Form

Thank you again for both taking the time to do the survey and being willing to participate in the interview for this study!

WHAT DO I HOPE TO LEARN FROM YOU?

This investigation, entitled “Teachers’ Instructional Planning Elements for an Online Environment.” is designed to explore instructional planning practice regarding your personal experiences of planning for your online instruction.

WHY IS YOUR PARTICIPATION IMPORTANT TO ME?

Learning about the priority and frequency you use certain elements in your online instructional planning will help me to summarize and synthesize the key elements in online instructional planning and provide a better understanding of online teaching planning practice.

WHAT WILL I REQUEST FROM YOU?

As one of fifteen classroom teachers participating in this study, I request you to:

- Participate in the study off school grounds and outside of working hours and check with a supervisor to ensure that you are permitted to participate in research studies in this particular way.
- Participate in one video or audio recorded individual interview, which will last about 45 -60 minutes. I will ask you some questions about your experience of instructional planning.
- Provide one example of your lesson plans for online instruction.
- After the interview, I will send you a summary less than one-page of our conversation and ask for your input on anything you’d like to keep or change before I pursue further with data analysis.

ADDITIONAL INFORMATION:

Please know that:

- The confidentiality of your personally identifying information will be protected to the maximum extent allowable by U.S. law.
- Your name and other identifying information will be known only to the researchers through the information that you provide. Neither your name nor any other personally identifying information will be used in any research presentation or publication without prior written consent.
- You may refuse to answer any questions during the interview if you choose to. You may also terminate your participation in the study at any time. (To do so, simply inform me of your intention.) Neither of these actions will incur a penalty of any type.
- Your participation in this study is completely voluntary. You may choose to withdraw from the study at any time. If you decline to participate, this decision will not endanger your current or future relationship with William & Mary.
- A summary of the results of the study will be sent to you electronically once it is complete, using the email address that you provide.

HOW CAN YOU CONTACT US?

If you have any questions or concerns or wish to withdraw from the study, please contact either Yanping Mo at 9098284462 (yym@wm.edu), James H. Stronge 7578803881 (jhstro@wm.edu), and Leslie W. Grant 7575930436 (lwgran@wm.edu). If you have additional questions or concerns regarding your rights as a study participant or are dissatisfied at any time with any aspect of this study, you may contact, anonymously if you wish, Dr. Tom Ward at 757-221-2358 (EDIRC-L@wm.edu) or Jennifer Stevens at 757-221-3862 (jastev@wm.edu), chairs of

the two William & Mary committees that supervise the treatment of study participants.

By checking the “I agree to participate” response below, then signing and dating this form, you will indicate your voluntary agreement to participate in this study and confirm that you are at least 18 years of age.

☐ I agree to participate.

☐ I do not agree to participate.

Please keep a copy of this consent form for your records.

Participant Signature: Date:

Researcher Signature: Date:

THIS PROJECT WAS FOUND TO COMPLY WITH APPROPRIATE ETHICAL
STANDARDS AND WAS EXEMPTED FROM THE NEED FOR FORMAL REVIEW BY
WILLIAM & MARY PROTECTION OF HUMAN SUBJECTS COMMITTEE (Phone 757-221-
3862) ON _____ AND EXPIRES ON _____

Vita

YANPING MO

Kunming, Yunnan, PRC. 13608855365

Email: yymo@wm.edu

EDUCATION

2023 PH.D. in Educational Policy, Planning, and Leadership, The College of William and Mary (W&M)

2014 M.A. in Curriculum and Instruction, Yunnan Normal University

1999 B.A. in English Education, Yunnan Normal University

EXPERIENCE

Aug. 2019 – May 2023 Graduate Assistant (GA) to Dr. Margret E. Constantino (W&M)

Sept. 2021 – Dec. 2021 Teaching Assistant (TA) to Dr. Megan X. Tschannen-Moran (W&M)

Jan. 2020—Jul. 2022 Reviewer, Lead Reviewer, & Production manager in The William & Mary Educational Review (WMER)

AWARD & GRANTS

2022 Dissertation Funding, W&M

2021 Executive EdD M-D Scholarship, W&M

2021 Sternberg Family Scholarship, W&M

2020 Educational Leadership International Student Scholarship, W&M

PUBLICATIONS & CONFERENCES

McGuire, S., **Mo, Y.** & Lavare, H. (2021, October 25-31). *What makes an effective teacher in a virtual environment* [Conference session]. Consortium for Research on Educational Assessment + Teaching Effective (CREATE).

Mo, Y., Grant, W. L., & Stronge, H. J. (Under review). Teacher instructional planning practice in an online instructional environment: A research synthesis. *Computer & Education*.

Mo, Y., Grant, W. L., & Stronge, H. J. (2021, October 25-31). *Effective teacher practices for online instructional design* [Conference session]. Consortium for Research on Educational Assessment + Teaching Effective (CREATE).

Mo, Y., & Huang, K. (2021, October 25-31). *Legal policies and guidelines regarding teacher morality in China and the United States: An overview* [Conference session]. Consortium for Research on Educational Assessment + Teaching Effective (CREATE).

Stronge, J. H, Xu, X, Grant, L. W., **Mo, Y.**, & Huang, K. (2021). Conceptions of teacher effectiveness and its implications for educational policy and practice in the United States. In L. W. Grant, J. H. Stronge & X. Xu (Eds.). *International beliefs and practices that characterize teacher effectiveness*. IGI Global.
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