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Identifying Core Components of Digital Literacy Initiatives for Adult Education Programs

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Walden University
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Abstract

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Dissertation Submitted in Partial Fulfillment

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Abstract

Digital literacy is a powerful tool for learners, and educational institutions and programs are tasked with the responsibility of developing frameworks, models, guidelines, or strategies within a digital literacy initiative to equip the learner. However, a lack of clarity and consensus on what constitutes digital literacy hinders developmental efforts and processes of digital literacy initiatives. The purpose of this qualitative modified Delphi study was to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. The concerns-based adoption model's innovation configuration dimension is the conceptual framework for this study. Through the research questions, expert consensus, explanations, and justifications were sought regarding core components of digital literacy initiatives in adult education programs. Data were collected using a modified three round Delphi technique. Round 1 consisted of interviews and Rounds 2 and 3 consisted of Delphi instruments to identify what experts agree are the core components of digital literacy initiatives in adult education programs. After the final round, 20 participants agreed upon 15 core components. The 15 core components addressed access, training, curriculum, active engagement, assessment, and systems and support of a digital literacy initiative. Advancing digital literacy skills through digital literacy initiatives has powerful implications for global economies, governments, and organizations, as well as providing a viable pathway for adult learner population that does not have sufficient access or the necessary skills to participate in a knowledge society.

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Dedication

This dissertation is dedicated to Violet M. Pitter, my mother, prayer warrior, encourager, motivator, sounding board, spiritual mentor, teacher, and greatest supporter.

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I AM BLESSED! I thank God for His grace and tender mercies that are new every morning. Your steadfast love never ceases. I thank God for Dr. Arome, her patience, unwavering kindness, and constant guidance. Thank you, Dr. Arome, for being a great advisor and committee chair. Thank you, Dr. Beck, my previous committee member. Your quick feedback and encouragement were greatly appreciated. Thank you, Dr. Englesberg; you saved the day and provided such clear and precise guidance. Thank you, Dr. Lane, for agreeing to join my committee at such a late stage, quickly deciphering my presentation, and providing such valuable feedback. Special thanks to Dr. Keen for her zeal, inspiration, and counsel.

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Thanks to my expert panelists who gave of their time and offered their expertise on this topic. I am truly honored you agreed to participate in this study and will always treasure the wealth of information you shared formally and informally. Finally, thanks to Kevin Sharpton for his resources, contacts, and referrals.

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Chapter 1: Introduction to the Study

Technology has the potential to advance and enrich the field of adult education by opening avenues to multifaceted experiences and supporting the continued development of knowledge societies (Inverso et al., 2017; Ross-Gordon et al., 2017). On the other hand, technological advancements have opened more pathways to huge information cache, and adult learners need to learn how to find, evaluate, utilize, share, and create content using information communication technologies in a wide range of media (Inverso et al., 2017). Digital literacy acquisition through digital literacy initiatives is the main channel where adult learners will harness the power of technological advancements in order to participate as full digital citizens in this knowledge society (U.S. Department of Education, Office of Educational Technology, 2017). Digital literacy is a powerful tool, and educational institutions are tasked with the responsibility of developing frameworks, models, guidelines, and strategies within a digital literacy initiative to equip the learner (Alexander et al., 2017). However, a lack of clarity and consensus on what constitutes digital literacy hinders developmental efforts and processes (Alexander et al., 2017). Therefore, in this study, I sought to identify the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. Chapter 1 includes the background, problem statement, purpose of the study, research questions, conceptual framework, nature of the study, and significance. Chapter 1 also contains the definitions, assumptions, limitations, scope, and delimitations of the study.

Background

Adult education programs provide adult learners who desire to learn English, earn postsecondary credentials, and transition to college or career with comprehensive educational and competitive workforce services (Ross-Gordon et al., 2017). The need for adult education students to be digitally literate became more evident in 2013 with the adoption of the College and Career Readiness Standards (CCRS) from the United States Department of Education's Office of Career Technical and Adult Education (OCTAE). These standards require adult education programs to prepare adults for college courses and, at the same time, prepare these adults to meet the demands of the workforce (U.S. Department of Education, OCTAE, 2015). The standards have a digital component in all subject areas and at all grade levels. Added to the adoption of the CCRS was the reauthorization of the Workforce Investment Act as the Workforce Innovation Opportunity Act (WIOA) in 2014. The WIOA describes digital literacy as one of the high-demand skills or workforce preparation activities that all students will need before exiting any adult education program (U.S. Department of Education, OCTAE, 2015). These high-demand skills or workforce preparation activities are implemented through a digital literacy initiative (Adams Becker, Pasquini, et al., 2017).

A digital literacy initiative will help adult learners acquire and develop the cognitive and technical skills (Adams Becker, Pasquini, et al., 2017) required to function in a digitally-driven society. However, the development of digital literacy initiatives has been hampered by the lack of consensus on what constitutes digital literacy (Alexander et al., 2017) and the wide range of tools and educational purposes (Johnson et al., 2016) that

encompasses digital literacy skills hinder developmental efforts and processes. The inconsistencies surrounding the development of digital literacy initiative frameworks, models, guidelines, and strategies in K-12 and higher education (Alexander et al., 2017) are also present in adult education programs (Reder, 2015; Russell et al., 2013). Adult education programs in this current knowledge society need to evolve, and the digital pathway is a major route (Ross-Gordon et al., 2017). Digital literacy acquisition and skills development through a digital literacy initiative is just one component of the services offered to adult learners (U.S. Department of Education, OCTAE, 2015), but it is vital to programs being fully compliant with WIOA and OCTAE. Thus, this study aimed to contribute to the literature by identifying what experts agree are the core components of digital literacy initiatives that can provide clarity and consensus for adult education programs.

Problem Statement

The problem that I addressed in the study is the lack of expert clarity and consensus on the core components of digital literacy initiatives in adult education programs. Digital literacy initiatives help citizens to learn varied digital technologies and apply digital skills and knowledge effectively (Adams Becker, Cummins, et al., 2017). In adult education programs, a digital literacy initiative can help adult learners acquire and develop the cognitive and technical skills needed to find, evaluate, create, and communicate information when using information and communication technologies. Implementing digital literacy initiatives with its wide range of tools, skills, competencies, and purposes (Johnson et al., 2016) will transform adult education programs, but the lack

of expert clarity and consensus on core components of digital literacy initiatives hinders programs from fully formulating frameworks, models, guidelines, best practices, and strategies for their programs (Alexander et al., 2017).

The wide range of tools and the varied educational purposes (Johnson et al., 2016) make digital literacy acquisition and skills development very attractive; on the other hand, it makes it a "nebulous area that requires greater clarification and consensus" (Alexander et al., 2016, p.1) which is a challenge for K-12 or higher education institutions. However, the development and adoption challenges that impede K-12 and higher education institutions and warrant a deliberate cultivation of frameworks, models, guidelines, and strategies also exist in adult education programs (Reder, 2015; Russell et al., 2013). Developmental efforts of digital literacy initiatives have remained unequal across age groups, communities, between institutions, academic departments, and individual faculty (Alexander et al., 2017). These developmental efforts are especially unequal and unsatisfactory in adult education programs (Reder, 2015; Russell et al., 2013). Robust amounts of research have been conducted about adult education and online learning, but the amount of literature relating to adults acquiring digital literacy skills is much smaller (Jacobs et al., 2014; Pendell et al., 2013; Sharp, 2017). The lack of attention in research given to digital literacy initiatives in adult education programs has been noted in recent literature (Hutchinson, 2016; Jacobs et al., 2014; Sharp, 2017) and contributes to the limited amount of high-quality research available on the core components of digital literacy initiatives for adult education programs. This study aimed to fill the gap and contribute to the literature by identifying what experts agree are the

core components of digital literacy initiatives that will provide clarity and consensus for adult education programs.

Current research indicates that the problem concerning the lack of expert clarity and consensus on the core components of digital literacy initiatives in adult education programs is both relevant and meaningful to the field of educational technology because it addresses the persistent issue of digital equity (Sharp, 2017). Adult education programs are tasked with implementing digital literacy initiatives to prepare adult learners to meet the demands of the workforce and, at the same time, be college ready. Advancing digital literacy has powerful implications for global economies, governments (Adams Becker, Cummins, et al., 2017), and organizations, as well as bridging the digital divide of an underserved population that does not have sufficient access or the necessary skills to participate in this digital era. The acquisition of digital literacy skills through a digital literacy initiative will help to bridge the digital divide of the adult education population (Sharp, 2017). "Digital literacy transcends gaining isolated technological skills to generating a deeper understanding of the digital environment, enabling intuitive adaptation to new contexts and cocreation of content with others" (Adams Becker, Cummins, et al., 2017, p. 24). It is a competence with a wide range of digital tools for varied educational purposes (Johnson et al., 2016). Therefore, the considerable variance that exists in digital literacy policies, frameworks, models, guidelines, and strategies across the U.S. and the rest of the world make it an imprecise innovation to implement (Alexander et al., 2016). As a result, individual institutions of learning are developing their own digital literacy initiatives without standardized support, distinct plans, and

cohesive strategies that can have broad-scale applications (Alexander et al., 2016). Therefore, the purpose of this study was to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs.

Purpose of the Study

The purpose of this qualitative modified Delphi study was to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. This development sought to identify core components of digital literacy initiatives that contribute to the development of frameworks, models, guidelines, and strategies for adult education programs. Possible participants in this study were program administrators, program directors, program coordinators, curriculum and instructional coordinators, and other professionals who are involved in the development of digital literacy initiatives in adult education programs, departments, or divisions.

Research Questions

This research study was guided by the following questions:

Research Question 1: What is expert consensus regarding core components of digital literacy initiatives in adult education programs?

Research Question 2: How do experts explain and justify the Delphi-derived core components of digital literacy initiatives in adult education programs?

Conceptual Framework

The conceptual framework for this study was the concerns-based adoption model (CBAM; Hall & Hord, 1987), which supported the identification of core components of digital literacy initiatives that will provide expert clarity and consensus for adult education programs. The CBAM is made up of three dimensions, stages of concern (SoC), level of use (LoU), and innovation configurations (IC; Hall & Hord, 1987). The three dimensions work together or independently as a framework for the systematic development of processes to advance innovations, programs, initiatives, or practices (Hord et al., 2014). For this study, the focus was on one of the three dimensions: IC. Two of the three dimensions - SoC and LoU are not in alignment with this study because they assess feelings, perceptions, and experiences of users during the implementation process, whereas the study is focused on identifying the core components of digital literacy initiatives. The IC - one of the three dimensions, aligns with this study because it focuses on identifying and describing the core components of any innovation, program, or initiative and helps to clarify what an initiative like digital literacy should look like in practice.

CBAM's IC dimension describes an innovation, program, or initiative in action and supports the formulation of an IC checklist or what is popularly called an IC Map (Aihi, 2013; Hord et al., 2013; Hord et al., 2014). The IC Map includes components and variations of the initiative. Components are the major operational features (Hord et al., 2014) of the innovation, program, or initiative and are divided into core components (critical) and related components (not critical). Variations are the range of the

components and represent the different ways the components will be operationalized when put into use (Hall & Hord, 1987; Hord et al., 2014). This study focused on identifying the core components of digital literacy initiatives, and the IC dimension of the CBAM conceptual framework aligned with the purpose of the study and informed the methodology of the study. Digital literacy initiatives with their wide range of tools, skills, competencies, and purposes may transform adult education programs, but the lack of expert clarity and consensus on core components of digital literacy initiative processes and efforts hinder programs from fully formulating frameworks, models, guidelines, and best practices for their programs. CBAM offered a process through which the development of components can be done systematically by a group of experts in an iterative process with the aim of identifying the core components of digital literacy initiatives.

Nature of the Study

This study used a qualitative approach with a modified Delphi method (Skulmoski et al., 2007) of inquiry to collect data. The Delphi method had been modified to "suit the circumstances and research question" (Skulmoski et al., 2007, p. 5) and made it a suitable method to identify the core components of digital literacy initiatives. In addition, the IC dimension of the CBAM framework supports the need for a team (Hord et al., 2014) or a panel of experts because identifying components is "an interactive and iterative process" (Hord et al., 2013, p. 13) and consensus building is encouraged to provide information on the components of digital literacy. Likewise, the Delphi method supported the CBAM framework with its vital features of consensus building, panel of

experts, and iterative process (Gallego & Bueno, 2014). The data collection method included interviews and Delphi instruments. The interviews were used to determine the components of a digital literacy initiative. The initial interviews were conducted over the telephone, by email, or via video call format. In subsequent Delphi rounds, consensus was sought from the expert panelists on the compiled list of core components that informed the final list of core components. To ensure the level of expertise of each participant, experts in adult education programs were selected who were involved with digital literacy initiatives. These experts were program administrators, program directors, program coordinators, curriculum and instructional coordinators, and other professionals who are involved in digital literacy initiatives.

Definitions

The following is a list of definitions that are only relevant to the focus of this study:

Adult education programs: Adult education programs serve adult learners (16 years and older) by offering basic instructions and varied educational services to adults who do not have postsecondary level credentials, English language acquisition activities for nonnative speakers of English (Ross-Gordon et al., 2017), and workforce preparation and training for adults who need to build foundational, employability, and occupational skills (Belzer & Kim, 2018).

Adult learner: Adult learners are adults aged 16 years and older who are not enrolled or required to be enrolled in school and who need high school equivalency

certification, basic education skills, English acquisition skills (Russell et al., 2013), and workforce preparation and training (Belzer & Kim, 2018).

Core components: Core components are the major operational features of digital literacy initiatives (Hall & Hord, 2015). These major operational features or core components will provide well-defined processes for the development of frameworks, models, guidelines, and strategies for digital literacy initiatives in adult education programs. An example of a core component of a digital literacy initiative is conducting a needs assessment.

Digital literacy initiative: A digital literacy initiative prepares citizens through the development of frameworks, models, guidelines, and strategies to effectively acquire and develop a set of competencies needed to participate fully in a knowledge society (Adams Becker, Pasquini, et al., 2017).

Expert: An expert is any individual with relevant knowledge and experience of a particular topic (Habibi et al., 2014).

Innovation: An innovation is any program, practice, process, object, behavior, procedure, or initiative that is seen as new to the individual, organization, or society (Hall & Hord, 2015; Rogers, 2003).

Knowledge society: A knowledge society is a digitally enhanced version of the industrial society where participants collaborate and evolve within cultural and economic networks by harnessing the benefits of information and communication technologies to improve humanity (Alexander et al., 2017).

Assumptions

Assumptions can affect the validity of the research process (Armstrong & Kepler, 2018). Expert panelists, a feature of the Delphi method (Gallego & Bueno, 2014), are needed to provide their opinion and reach a consensus on the issue presented to them. In this qualitative Delphi study, I assumed that the expert panelists would treat the study seriously and answer the questions honestly. I also assumed that the panelists would provide expert knowledge about digital literacy initiatives for adult education programs. It was further assumed that a consensus on core components would be reached after three rounds.

Scope and Delimitations

The scope of this study was to identify the core components of digital literacy initiatives that will provide expert clarity and consensus for adult education programs. The core components are the operational features of digital literacy initiatives. These major operational features or core components of digital literacy will provide well-defined processes for the development of frameworks, models, guidelines, and strategies for adult education programs. Limiting the scope of the study to core components of digital literacy initiatives would provide future developers with a map or picture of what this initiative should look like for their programs. Core components are broad enough for programs to add variations and create their unique initiative and narrow enough to remain compliant to any standardized process in the future.

The delimitations were the following characteristics that limited the scope of the study: digital literacy initiatives, the adult learner population, and experts in adult

education programs. Digital literacy was the focus of this study because there is a lack of expert clarity and consensus on the core components of digital literacy initiatives for adult education programs. A lack of clarity and consensus on the core components of digital literacy initiatives creates an inequity across the educational arena (Johnston, 2020) for establishing frameworks, guidelines, and models for this specific population.

The focus population was adult learners in adult education programs. Adult education programs provide learners with basic instruction and educational services to adults below the postsecondary level in reading and mathematics and English language instruction for nonnative speakers of English (Russell et al., 2013). This population is being studied because of the lack of expert clarity and consensus on core components of digital literacy initiatives, which will help them to become full digital citizens.

Participant selection was to be based on those who are considered experts in adult education programs. Possible participants considered for this study were program administrators, program directors, program coordinators, curriculum and instructional coordinators, and other professionals who are involved with digital literacy initiatives in adult education programs. These participants are involved with digital literacy initiatives in adult education programs.

Limitations

A limitation might be a personal bias based on my professional role in an adult education program. My interest and professional mandate to establish a digital literacy initiative for my program motivated me to find a solution and could cause a personal bias to view a certain response as the solution to the problem. Researcher bias could stem

from a single individual who will conduct interviews, organize, and rate the participants' responses. However, the feedback component of the Delphi method, where the researcher shares all responses with the participants and provide the participants with an opportunity to confirm or change their responses (Pilcher, 2015), allows for checks and balances in an iterative process. These checks and balances could help to reduce any bias on my part.

The Delphi method was used to systematically gather and combine expert opinions on a complex problem with the hope of reaching an informed group decision or consensus (Donohoe et al., 2012). Experts were invited to volunteer to participate in multiple rounds for a set period of time. The voluntary nature of the study and the multiple rounds could contribute to attrition, and using a purposive sampling method could result in "getting participants who may have a high interest in the research problem and results" (Donohoe et al., 2012, p. 44).

The purpose of this study was to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. Adult education programs serve adult learners who want to learn English and earn postsecondary level credentials (Ross-Gordon et al., 2017). This focus on core components for this adult learner population was a limitation that also defines the scope of the study. Future studies could include continuing education, libraries, technical and community colleges, and other nontraditional adult learning educational programs.

Significance

This qualitative modified Delphi study aimed to make an original contribution to the field of educational technology by addressing the disparities that exist in the

development of frameworks, models, guidelines, and strategies of adult education digital literacy initiatives. Identifying the core components of digital literacy initiatives will provide expert clarity and consensus for adult education programs and will prepare learners to acquire and develop cognitive and technical skills through the development of frameworks, models, and guidelines (Adams Becker, Pasquini, et al., 2017). The development of an innovation, program, or initiative is a difficult process and may require a lengthy period of time (Hall & Hord, 2015; Rogers, 2003); therefore, identifying the core components of digital literacy initiatives that can provide clarity and consensus for adult education programs will help the teachers, stakeholders, and policymakers establish and sustain frameworks, models, guidelines, and strategies that are specific and responsive to the needs of the adult learner.

Identifying core components of digital literacy initiatives specifically for adult education programs will help programs to fulfill state and federal mandates. Additionally, teachers, administrators, stakeholders, and policymakers will be able to meet the demands of an evolving digital culture by providing adult learners with relevant skills. Adult education programs will be able to help learners master new avenues that emerge, thus ensuring that learners refocus their attention on diverse contexts of use, emergent modes of work, and communities of practice (Meyers et al., 2013). In an ever-changing, information-rich world, digital literacies have become indispensable (Underwood et al., 2013). Learners need to acquire skills that allow them to effortlessly adapt as digital literacy skills constantly evolve and play a pervasive role in every aspect of society (Jimoyiannis & Gravani, 2011) in this digital age. Adult education programs will prepare

students for new technological environments while addressing the digital divide through digital literacy initiatives.

Addressing the digital divide through a digital literacy initiative is a positive social change. Improving adult learners' digital literacy skills through a digital literacy initiative is central to bridging the digital divide and an attempt to fill the gap. The digital divide is often described as the gap between those who have access to information communication technologies and those who do not (Anderson, 2019; Lee & Kim, 2019; Scheerder et al., 2017; U.S. Department of Education, Office of Educational Technology, 2017). However, the new digital divide is now manifest in the lack of access, lack of knowledge, and a lack of skills transmission (Chetty et al., 2018; van Deursen & van Dijk, 2019). A positive social change through digital literacy initiatives can bridge the gap to digital inclusion and digital equity (Castek et al., 2017; van Deursen & van Dijk, 2019). Adult learners in adult education programs on the wrong side of the digital divide (Castek et al., 2017) will need digital literacy training through a digital literacy initiative in order to be successful in the digital era. To facilitate digital literacy training within a digital literacy initiative, adult learners will need access to relevant, up-to-date technology, technical support, and connections (Chetty et al., 2018). Digital literacy initiatives can create a bridge to advance digital equity and cultivate digital inclusion in adult education programs (Scheerder et al., 2017).

Summary

In this chapter, I presented an introduction to the study, background information, a description of the problem to be studied, the purpose of the study, the research

questions, and the nature of the study. The conceptual framework was addressed along with the definition of key terms. In Chapter 2, I present a review of literature that provided the grounding for this study.

Chapter 2: Literature Review

The purpose of this qualitative modified Delphi study was to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. In this study, I sought to identify core components of digital literacy initiatives that contribute to the development of frameworks, models, guidelines, and strategies for adult education programs. The existing frameworks were not geared towards this group of adult learners (Reder, 2015; Russell et al., 2013; Sharp, 2018), and research on adult digital literacy skills development for adult education programs was limited (Hutchinson, 2016; Sharp, 2017). The identification of core components provides a guide for adult education programs to develop a systematic process for future implementation. This study aimed to contribute to the literature by identifying what experts agree are the core components of digital literacy initiatives that can provide clarity and consensus for adult education programs.

Literature Search Strategy

In conducting the literature search for this study, the Walden University Library and Google Scholar were utilized to explore a variety of sources. The following databases were reviewed: Dissertation and Theses, ERIC and Education Source Combined Search, Google Books, Taylor and Francis Online, Thoreau Multi-Database Search, ProQuest Central, SAGE Journals, ScienceDirect, The Learning and Technology Library (LearnTechLib), and Education Source. Publication dates for many of the searches were not limited to the suggested 5 years from data of study completion because of the need to establish the origins of digital literacy, and older journal articles helped to place the

problem being explored into its historical context. To identify current trends, however, I limited the time frame of the studies to the suggested 5 years. Still, a few older articles offered valuable information that placed the phenomena being investigated into perspective and therefore influenced the presentation of the reviewed literature.

Reviewing the literature on digital literacy revealed that older literature served as foundational support for the current problem in this study. According to the literature, the current problem of digital literacy acquisition and necessity that now faces adult learners has been evolving for over 60 years. The limited research on adult digital literacy is the lack of research about what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. To locate relevant research to inform my study, I searched for *technology integration, ICT literacy, and adult learner technology*. The search yielded literature about digital literacy in K-12 and higher educational institutions and provided perspectives on the issues related to the development of digital literacy initiatives for adult education.

Keywords used for the literature review include the following: *digital literacy, adult digital literacy, adult literacy, ICT, ICT literacy, digital divide, adoption of innovation, innovation implementation, adult learners and technology, technology in adult education, digital literacy program, technology adoption, technology implementation, technology integration, digital literacy adoption, innovation adoption, implementation of innovation, origins of digital literacy, Delphi study, Delphi method, Delphi study in education, digital literacy frameworks, media literacy, information literacy, technology literacy, universal literacy,* and *digital literacies.*

Conceptual Framework

In this study, I sought to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. The conceptual framework framing this study was the concerns-based adoption model (CBAM; Hall & Hord, 1987). CBAM was formulated from Fuller's (1969) work that examined the changes and concerns of undergraduate teachers during their stages of teacher preparation (Hall & Hord, 1987). It was specifically designed for the educational setting through a research center at the University of Texas at Austin, where the researchers sought "to explore issues involved in implementation of new programs and practices in the nation's teacher education institutions and in schools and classrooms" (Hord et al., 2013, p.2). CBAM was developed to address the concerns about the implementation of significant changes within an organization (Hall & Hord, 2015). In this study, it provided a lens through which experts can provide clarity and consensus by identifying the core components of digital literacy initiatives.

CBAM is made up of three dimensions SoC, LoU, IC (Hall & Hord, 1987). SoC assesses the feelings and perceptions of the implementers' or educators' experience with innovation, while the LoU assesses the degree to which the innovation is being used. The IC is a tool to identify and describe the various core components of the innovation and helps to spell out what an initiative should look like in practice (Hall & Hord, 1987). Although the three dimensions work together as a framework, they are also applied independently to frame the systemic development of processes to enhance innovations, programs, or practices (Hord et al., 2014). This study directly aligned with one of the

three dimensions, IC, which highlights the various components of an innovation that directly outlines a clear path for innovation development. This direct alignment provided a lens through which developers of digital literacy initiative frameworks, models, or guidelines can identify the core components for adult education programs.

CBAM's IC dimension was developed sometime after the SoC and LoU dimensions in an effort to correctly capture the varied presentations of an innovation that was observed in practice (Hord et al., 2013). Researchers and developers of the CBAM framework observed that developing and then implementing an innovation, program, or initiative was hindered when there was a lack of clarity about the innovation and what teachers and implementers are asked to do (Hall & Hord, 2015). Providing materials, resources, attributes, goals, and other implementation requirements was not sufficient to provide clarity to answer the questions, "Just what is this innovation?" (Hord et al., 2013, p. 4). This lack of clarity gave conflicting signals and caused confusion for change facilitators, principals, program administrators, and teachers. They were left to interpret and create their version of what they thought or understood of the innovation, program, or initiative. Variations of the innovation were being presented, and some of these varied presentations were aligned with the goals of the innovation. In contrast, others were not aligned and did not closely resemble what was expected during use. This realization that attributes, goals, and implementation requirements of an innovation do not provide clear operational features or components of the innovation-led to CBAM's third dimension – Innovation Configuration (IC).

ICs are the patterns of an innovation and focus on a comprehensive image of the innovation and the various components or operational forms (Hall & Hord, 2015). The IC dimension focuses on developing and applying descriptions of what the "use of the innovation can look like" (Hall & Hord, 2015, p. 56), how it operates, or what its configurations are. The IC is a construct, tool, or process that can be used to develop a central understanding of what the innovation can look like and will look like when in full use (Hall & Hord, 2015). In this study, this concerns' model dimension addressed the configuration of the innovation – digital literacy initiative by focusing on the identification of core components. CBAM's IC dimension describes an innovation, program, or initiative in action and supports the formulation of an IC checklist or what is popularly called an IC Map (Aihi, 2013; Hord et al., 2013; Hord et al., 2014).

An IC Map describes the core components of a program and unpacks each part of the innovation, program, or initiative through definitive, clear, and specific procedures that can support comprehensive implementation processes (Hord et al., 2013). The IC Map includes components and variations of the innovation, program, or initiative. IC Maps help clarify differences and establish ideals through a consensus process (Hord et al., 2014). They provide teachers, facilitators, administrators, and implementers with vital operational features that are sometimes overlooked during training and professional development events for the innovation. IC Maps provide clarity through the agreed-upon components of the innovation, program, or initiative. The precise expectations of the components offer innovation fidelity in the variation continuum that is a dynamic part of IC Maps (Hall & Hord, 2015).

Components are the major operational features (Hord et al., 2014) of the innovation, program, or initiative. Components are the different configurations of the innovation and are divided into core components (critical) and related components (not critical). Core components are essential to the innovation, and related components are not crucial but recommended for the overall development of the innovation (Hord et al., 2013; Hord et al., 2014). The designation of components as core or related should be completed through teamwork or a consensus reaching process. Components are different from implementation requirements. According to Hord et al. (2013), implementation requirements are physical or support services which include funding, schedule, policies, and materials and or resources, while components refer to the people element or behavior, which includes beliefs, values, norms, attitudes, and relational aspects of the users as they use the innovation (p.4). The development of components makes IC Maps a dynamic, iterative process that cannot be completed in a vacuum. Components consist of a number of possible variations that represent the different ways in which the innovation can be put to use. Variations are the range of the components along a continuum from ideal to unacceptable or less desirable and show the various ways the components can be used to represent the innovation when implemented (Hall & Hord, 1987; Hall & Hord, 2015; Hord et al., 2014).

ICs have been used for a variety of purposes – research, evaluation, dissemination, and professional development. The research application of ICs can use the information to test the extent to which best practices, when applied, can impact the overall outcome or assess the behavior of members of a control group against the

behavior of participants in a treatment group in the adoption and implementation process (Hord et al., 2013). The evaluation application of ICs can be used to evaluate whether an innovation has been fully implemented and what the innovation should look like when implemented or after being implemented. The results of the evaluation can be used to assess and sometimes alter future implementation of the innovation (Hord et al., 2013). Dissemination application of IC provides clear, tangible descriptions about the configurations of an innovation, program, or practice. In this context, components are made clear prior to implementation so that teachers, administrators, trainers, researchers, and others will know what to expect and what components must be included for implementation to be considered successful (Hord et al., 2013). The professional development applications of IC provide a record of what teachers actually do with an innovation and thus give an indication of how professional development might be modified, recreated, redesigned, or completely changed (Hord et al., 2013).

IC applications in the above four areas are not always limited to one purpose within a given context, and the application context always points to a process of change (Hall & Hord, 2015). In a descriptive case study, Towndrow and Fareed (2015) used IC Maps as a professional development tool to identify and describe the different ways to implement one-on-one laptop computing. The motivation for the study was the lack of consistent or congruent practices among students and teachers in this laptop computing program. IC Maps were used in the following three areas: setting and directing information and policy, evaluate objectives concerning the innovation, and planning activities based on concerns identified. They found that IC Maps were a "viable means

for bridging educational policy and implementation gaps" (Towndrow & Fareed, 2015, p 417) because the IC Maps provided clear descriptions of the components of the innovation.

Likewise, Donovan et al. (2014) used IC Maps because there was a lack of a consistent definition of what constitutes 21st-century skills. This lack of a consistent definition hindered teacher educators from properly preparing teachers for a 21st-century learning environment they could not clearly describe. Donovan et al. (2014) used IC Maps to identify the configurations of the 21st-century learning environments and, in turn, provided a consistent process for the development of a framework for planning and implementing a professional development program for teachers in a 21st-century learning environment. Additionally, the IC Map was used to identify best practices of 21st century skills in the classroom. Donovan et al. (2014) and Towndrow and Fareed (2015) applied the IC dimension for professional development and evaluation, although Donovan et al. (2014) had the added benefit of applying the IC dimension for dissemination.

VanDerHeyden and Allsopp (2016), in their study, used IC for all four purposes, research, evaluation, professional development, and dissemination. The IC dimension was used as an evaluative tool for later dissemination of state licensure requirements and teacher preparation in pre-K-12 mathematics and professional development. These researchers recognized that it was not enough for mathematics teachers to just teach from the textbook and expect all students to grasp the concepts and skills needed to show mastery. There was a demand for high-quality mathematics instruction for all students at all levels. Teachers needed to understand and demonstrate mastery of the mathematics

content they teach, understand how students learn the mathematics content and understand the integral part assessment plays in overall student outcomes. An IC was used to establish a substantive description of the components that form a high-quality mathematics program. The IC was used to evaluate the current program, provide improvements for requirements, and plan professional development activities for teacher preparation.

The use of the IC in the three studies sought to rectify inconsistencies, differences, and other discrepancies in the use of innovations, programs, or initiatives. CBAM's IC dimension was used in different ways, and the IC applications overlapped and served multiple purposes. In this study, I sought to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. Digital literacy initiatives with its wide range of tools, skills, competencies, and purposes hinder developmental efforts and processes (Johnson et al., 2016). The inconsistencies surrounding the development of digital literacy initiative frameworks, models, guidelines, and strategies stem from a lack of clarity and consensus on what constitutes digital literacy. CBAM's IC dimension supports the process involved in identifying core components of digital literacy initiatives. The identification of components is the first step in the IC process. Dividing these components into core components and related components directly correlates and helps to clarify what an initiative like digital literacy should look like in practice. CBAM will address the configuration of the innovation - digital literacy initiatives and achieve the purpose of

identifying what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs.

Literature Review Related to Key Concepts

Origins of Digital Literacy

Digital literacy has evolved over the past 60 years. The trend, concept, and need existed before the term 'digital literacy' was coined in 1997 by Gilster. Gilster (1997) added the word digital to the word literacy to capture the concept that was bandied about in the field of education for over 30 years. Prior to the newly coined term, there was a steadfast awareness of the concept of digital literacy that stemmed from the ever-changing characterization of what constituted literacy because literacy has always been linked to technology. Prior to the digitization of books, the tools used to produce books were technologies. These tools or devices evolved as the society moved further into the computer age (Bawden, 2008; Belshaw, 2014; Sharma et al., 2016). Literacy or traditional literacy began to significantly overlap with the emerging technologies of the time.

In 1971, the inception of a digital library, now Project Gutenberg, was created, and thus the beginning of the need for users to learn how to access and use digital libraries (Belshaw, 2011). The need to learn and use these digital libraries reinforced the strong link of literacy to the emerging technologies. In 1979, the establishment of Apple Education Foundation enabled educational institutions to access Apple II systems, so teachers, as well as students, needed to be digitally literate in order to take full advantage of the resources (Rawlins, 2017). By the late 1980s and early 1990s, educators, writers,

and researchers were developing a discourse about the idea of redefining literacy to include the new technologies that existed.

The list of terms that were examined for patterns, links, or relationships to the notions that encompassed the concept of digital literacy included visual literacy, technology literacy, computer literacy, electronic literacy, media literacy, information literacy, and ICT literacy. Each term was too restrictive and did not adequately cover the emerging concept of digital literacy (Bawden, 2008). All the terms had trace elements of what constituted digital literacy, but none of them fully incorporated the concept. Additionally, some terms were used synonymously – electronic literacy and information literacy to portray the concept of digital literacy. A term that covered the digital age, information communication technologies, acquisition of knowledge, techniques, and skills was needed (Bawden, 2008; Belshaw, 2014; Fieldhouse & Nicholas, 2008).

Gilster's (1997) definition of digital literacy sought to encompass all the elements that comprised the concept of digital literacy. According to Gilster, digital literacy is "an ability to understand and use information from a variety of digital sources" (p. 1). However, his generality of the definition is one of the strengths of the definition, yet it sparked a debate about the imprecision and vagueness of the concept. However, the broad definition has come to be accepted as a comprehensive coverage of the concepts and principles that are comprised of digital literacy because the principles were broad (Bawden, 2008; Gilster's definition has an enduring value because it has stood the test of time and the evolution of the digital era. The digital ecosystem of the 1990s was far behind the current digital ecosystem. Even though Gilster talked about the internet age,

network computers, and hypertext, his definition was broad enough to incorporate future renditions and applications of an ever-changing digital ecosystem.

The evolution of the term 'digital literacy' continued even after the coinage in 1997. The definition of digital literacy was revolutionary because it looked at the ability of the learner to use information in multiple formats from a wide variety of sources. Gilster's (1997) definition was not limited to a specific technology (Bawden, 2008; Sharma et al., 2016). The definition targeted ideas and mindsets of the learner or user and indirectly incorporated skills, competencies, and information resources. Gilster's (1997) "mastering ideas not keystroke" (p.25) description of digital literacy proved to be revolutionary even though he framed his definition from the significantly large body of literature that was already in existence (Bawden, 2008). Other broad concepts existed, but none of them clearly captured the essence of what became known as digital literacy.

Digital Literacy Initiatives

A digital literacy initiative can prepare adult learners with the required knowledge, skills, and competencies necessary to participate and contribute to their digital world (Adams Becker, Pasquini, et al., 2017). "Digital literacy has become one of the most frequent subjects in policy debates and educational research." (Karpati, 2011, p.9). Educational institutions, as well as government agencies, are vested with the responsibility of developing digital literacy initiatives that will help learners in their acquisition and application of digital technologies in this digital society (Adams Becker, Cummins, et al., 2017; Johnson et al., 2016). Educational institutions, in conjunction with employers, have been working to develop digital literacy initiatives that would provide

learners with the full spectrum of tools, skills, competencies, and abilities (Alexander et al., 2016; Alexander et al., 2017). Additionally, digital literacy initiatives need to address how digital tools work, why they are useful in their society, and when to use them. Digital literacy initiatives must include all the elements of digital fluency and digital citizenship, which comprises the following elements: access, commerce, communication, collaboration, etiquette, health, welfare, law, security, privacy, rights, and responsibilities (Alexander et al., 2016). Factors that impede the successful development of digital literacy initiatives vary, but the idea that students are digital natives and appear to be digitally literate hinders the effective execution of any initiative (Alexander et al., 2017). Digital natives are not necessarily digitally literate; therefore, educational institutions are responsible for empowering students to use digital tools, find, evaluate, create and communicate across a wide array of information and communication technologies, and guide students in developing both cognitive and technical skills.

Educational institutions found it challenging to effectively prepare students for the future in which digital tools are an intuitive process. These institutions discovered that students and faculty were not effectively harnessing the elements of the digital environments in which they found themselves. The digital divide was expanding, and it was not just an issue of access to technology but an issue of fluency (Bhatt et al., 2015; Castek & Manderino, 2017). This issue of digital fluency is hindered by a lack of digital literacy skills in both students and faculty that will not only address the current need but will be applicable to technologies of the future. Digital literacy initiatives are hampered by a lack of consensus on what comprises digital literacy (Alexander et al., 2016). This

lack of agreement hindered institutions from formulating policies and programs that were comprehensive enough to include the wide range of tools, skills, competencies, and abilities that is digital literacy. Progress has been made towards the cultivation of frameworks, models, guidelines, and best practices, but there is "considerable variance" in the policies, adoption, development, and implementation programs in institutions across the United States and the rest of the world (Johnson et al., 2016). Unfortunately, individual institutions are developing their own digital literacy initiatives without standardized strategies to support the development process on a national or international level (Alexander et al., 2016; Alexander et al., 2017; Castek & Manderino, 2017; Feerrar, 2019).

Digital Literacy Initiative Frameworks

Frameworks, models, guidelines, and best practices are used to support the development of digital literacy initiatives. However, the lack of consensus gives rise to numerous frameworks, models, guidelines, and best practices which in turn contribute to the lack of clarity. The variety and complexity of the different frameworks are reflective of the disparity that exists in the field of digital literacy (Feerrar, 2019). Yet, the existing digital literacy frameworks share several features "across institutions and nations" (Alexander et al., 2017, p.4). One commonality is the plurality of digital literacy and the recognition of the multiple elements within these digital literacies that establish the ongoing development of digital literacy initiatives (Adams Becker, Pasquini, et al., 2017). The frameworks, models, guidelines, and best practices can be applied to digital literacy initiatives in various institutions, programs, and corporations. These frameworks, models,

guidelines, and best practices have been developed by individual institutions, professional organizations, government organizations, not-for-profit and non-profit companies and organizations, and individual scholars (Feerrar, 2019).

Belshaw (2014) presented eight essential elements of digital literacy. According to Belshaw, a digitally literate individual is someone who has a good balance of all eight elements in terms of their digital skills, attributes, practice, and identity. His framework integrates ongoing developments and transformation, which is broken down into the following eight elements; cultural, cognitive, constructive, communicative, confident, creative, critical, and civic. Belshaw's framework can be used to develop digital literacy initiatives that integrate the technical skills, social-psychological, and cultural competencies. All eight elements must be combined to get the desired effect of developing effective digital literacies. The context of the digital literacy initiative will determine to what extent each of the elements is injected and then fused to form a cohesive digital literacy initiative.

The eight elements, when combined, embody the essence of digital literacies (Belshaw, 2014) and are foundational to the development of digital literacy initiatives. The cultural element is acquired when the learner or user learns to navigate the different digital environments while using communication technologies in varied contexts. The cognitive element is where the learner or user develops their mastery of specific tools and technologies for a variety of systems, platforms, software, and devices. The constructive element is acquired when the learner or user shows awareness of the different ways they create, construct, reuse, and remix resources and content to create something new that

benefits other learners. With the communicative element, learners and users will be able to understand and utilize the different ways they can communicate through networks by using a variety of protocols and values that govern communication in the new digital world. The confident element proposes that the learner or user be confident in the use of digital technologies, understand, capitalize, manage personal learning environments and digital communities of practice. The creative element is when the learner or user utilizes digital technologies to develop processes, procedures, and systems that support certain interfaces and digital resources. Simply, the critical element is acquired when the learner or user develops an understanding of online security, protocols, identity, and data management by analyzing content and resources for effective application. Finally, the civic element is when the learner or user develops a critical awareness of how the digital world can link them to the local, national, and global organizations and seek opportunities for community engagement and citizenship through digital technologies (Belshaw, 2014).

Correspondingly, Alexander et al. (2016) agreed with Belshaw's (2014) presentation of the eight elements of digital literacies but presented them as three comprehensive models with their own "distinct standards, potential curriculum, and implications for creative educators" (Alexander et al., 2016, p.5). Alexander et al. conducted a study on how colleges and universities establish models and best practices for the development of successful digital literacy initiatives. This study breaks down digital literacy into three different models - universal literacy, creative literacy, and literacy across disciplines.

Universal literacy is "a familiarity with using basic digital tools such as office productivity, software image manipulation, cloud-based apps and content, and web content authoring tools" (Alexander et al., 2016, p.6). Universal literacy has elements of media and information literacy that are interwoven in its application; therefore, fostering creative skills, information seeking skills, collaboration skills, and critical thinking skills. Creative literacy comprises all features of universal literacy with added challenging technical skills that “lead to the production of richer content, including video editing, audio creation and editing, animation, an understanding of computational device hardware, and programming” (Alexander et al., 2016, p.6) along with digital citizenship and copyright knowledge (Adams Becker, Pasquini, et al., 2017). Creative literacy fosters more challenging creative skills, critical thinking skills, and a multitude of technical skills. Literacy across disciplines is the development of digital literacy throughout different classes that are unique to the learning context of the participants. Each educational discipline within higher education institutions would focus on developing digital literacy skills from their perspective. For example, "sociology courses can teach interpersonal actions online, such as the ethics and politics of social network interaction, while psychology and business classes can focus on computer-mediated human interaction" (Alexander et al., 2016, p.6).

The three models are based on the careful review of nine frameworks and 21 best practice exemplars. The three models can be incorporated into digital literacy initiatives. All three models are essential to the comprehensive development of any

digital literacy initiative because even in the field of education, digital literacy means different things to different groups (Alexander et al., 2016). How the humanities department views digital literacy will be completely different from how it is viewed in the computer science department. Additionally, how different departments in a higher educational institution approach the social, cultural, and technical factors of digital literacy was vastly different and contributed to the ongoing disparity in development efforts (Adams Becker, Cummins, et al., 2017).

Alexander et al. (2016) agreed with Belshaw's (2014) eight elements of digital literacies; however, instead of eight elements, there are three models. The three models are comprehensive and encompass Belshaw's eight elements. Universal literacy covers all eight elements in some aspects, while creative literacy dives deeper into the eight elements and wraps technical skills with socio-cultural components. Undeniably literacy across the disciplines is the development of all eight elements throughout any digital literacy initiative, classroom, department, institution, organization, or country. A strong characteristic of older frameworks of digital literacy has been the focus on technical skills, yet Belshaw seemed to make technical skills secondary in all eight elements (Adams Becker, Cummins, et al., 2017). Belshaw's overall focus echoed Gilster's (1997) original idea that digital literacy means "mastering ideas, not keystroke" (p.25). Eshet-Alkalai (2012), a forerunner to Belshaw and Alexander et al., proposed a conceptual framework for survival skills in the digital era. Eshet-Alkalai proposed the following six types of literacies: Photo-visual literacy is the ability to understand messages presented in visual-graphical displays. Reproduction literacy is the ability to create utilize digital

reproduction to create new meaning through editing or manipulating any form of media. Branching literacy is the ability to navigate complex knowledge and domains in cyberspace. Information literacy is the ability to critically evaluate, locate, and use information appropriately and effectively. Socioemotional literacy is the ability to understand and apply data and knowledge through collaboration through various media. Real-time thinking literacy is the ability to effectively process large volumes of fast-moving variety of rich media in real-time environs (Eshet-Alkalai, 2012). All six literacies are vividly perceptible in the three models proposed by Alexander et al., and when used together in digital literacy initiatives, they can help to develop the learners' digital skills repertoire.

Eshet-Alkalai's (2012) six types of digital literacies, Belshaw's (2014) eight elements of digital literacies, and Alexander et al.'s (2016) three models of digital literacies have several overlapping elements. The focus on the plurality of digital literacies is most evident, and information literacy is interwoven into the competencies presented. Eshet-Alkalai explicitly identified information literacy as one of the types of literacies, while Alexander et al. regarded it as a component of universal literacy. Belshaw (2014) treats information literacy as a comprehensive element that is present in all eight elements depending on the context of the learner or user. Belshaw's eight elements are like ingredients merged together in a recipe to create a product (Belshaw, 2014); therefore, information literacy is interlaced in the eight elements of digital literacies presented by Belshaw (2014).

Feerrar (2019) conducted a case study of The Digital Literacy Task Force (DLTF) at Virginia Polytechnic Institute (Virginia Tech). The DLTF aimed to develop a framework for digital literacy that can be used to create or begin the first stages in developing a digital literacy initiative (Feerrar, 2019). The DLTF framework endorsed the plurality of digital literacy by viewing digital literacy as an umbrella term that included information, data, media, and intervention literacies. Each literacy overlaps and interrelates in concept, development, and implementation. Additionally, the literacies reflect each other no matter which one becomes the main focus at the implementation stage. For example, it is impossible to focus on media literacy without reflecting on information literacy. Following this discovery of overlapping elements, the DLTF identified seven overlapping competencies or elements of digital literacy - discovery, evaluation, ethics, creation and scholarship, communication and collaboration, identity and wellbeing, and curation. These competencies are framed by five key values – participation, curiosity, reflection, equity, and social justice, and creativity. The five key values "connect and conceptualize the competencies" (Feerrar, 2019, p. 102). Central to the competencies and the values is the learner for whom the framework is designed.

The DLTF framework was designed for a specific institution – Virginia Tech, but the competencies and key values that are addressed in the DLTF framework are adaptable and can be used in varied contexts to begin or revise existing digital literacy initiatives (Feerrar, 2019). Feerrar agreed with Alexander et al.'s (2016) comprehensive models on digital literacy but extended the framework by recognizing digital literacy as having multilayered components and a dynamic set of skills, attitudes, and knowledge (Feerrar,

2019). Feerrar's digital literacy umbrella terms are comparative to Alexander et al. (2016) Universal Literacy because they both have elements of media and information literacies woven into the terms. Also, creativity or creation is a major element of competence in Belshaw's (2014), Alexander et al.'s, and Feerrar's frameworks. The creative element of digital literacy advances the skill and knowledge of the learner and helps to cultivate critical thinking skills that may be applicable to surviving in a digital society. Finally, Feerrar explicitly stated and illustrated the centrality of the learner in the DLTF framework. Other frameworks design the skills, knowledge, and concepts for the learner or student, but Feerrar made the learner part of the multilayered components of the framework. The visual representation shows the learner at the center with the seven competencies projecting out. The five values then overlap on the outer edge while framing the competencies.

The design of the DLTF framework reflects the design of Jisc's (2019) framework for digital literacy. Jisc, a non-profit organization, designed the Digital Capability Framework. The Digital Capability Framework is a redesign of Jisc's previous framework that displayed seven elements of digital literacies. Jisc improved on the previous framework by advancing digital literacies to digital capabilities. Digital capabilities still capture the plurality of digital literacies but progresses the concept to capabilities because the capabilities fit an individual for living, learning, and working in a digital society (Jisc, 2019). Learners are exposed to digital skills in everyday life but do not know how to use them effectively to garner the desired results in a digital society. The Digital Capability Framework has six elements - ICT proficiency, information, data, and media literacies,

digital creation, problem solving and innovation, digital communication, collaboration and participation, digital learning and development, and digital identity and well-being.

ICT proficiency is the central element of the Digital Capability Framework, and the other five elements overlap. ICT proficiency is a functional skill that is transferable and applicable across devices, software, services, and applications (Jisc, 2019). ICT proficiency refers to the basic concepts in digital technologies and information processing. This functional skill is presented in the DLTF framework, but it is embedded in the competencies and not emphasized as a separate element. Embedding the functional skill is reflective of Gilster's (1997) "mastering of ideas not keystroke" (p. 25) and Belshaw's (2014) secondary treatment of technical skills. On the other hand, Alexander et al. (2016) make functional skills a part of universal literacy. Digital identity and well-being are presented as an umbrella element in the Digital Capability Framework. Belshaw (2014) depicted digital identity and well-being in three elements civic, cultural, and confident; the civic element has more of the characteristics. Eshet-Alkalai (2012) made it a part of socio-emotional literacy, while the DLTF framework explicitly stated it on the seven competencies.

Other frameworks, models, guidelines, and best practices have been developed with the purpose of trying to standardize digital literacy and making the multiple elements more feasible and applicable for digital literacy initiatives (Alexander et al., 2017; Feerrar, 2019). The frameworks, models, guidelines, and best practices shared many overlapping elements while at the same time, they emphasized some elements at the risk of minimizing other elements. Despite the lack of consensus on the definition and

the lack of clarity of standardization efforts, no framework, model, guideline, and best practice focused solely on technical skills (Alexander et al., 2016; Belshaw, 2014; Feerrar, 2019). This shows a deviation from earlier attempts to define digital literacy and establish frameworks for the adoption and development of initiatives (Alexander et al., 2017; Bawden, 2008; Eshet-Alkalai, 2012; Feerrar, 2019). On the other hand, all the frameworks reviewed had information and media literacies as essential elements, thus endorsing the frameworks that refer to digital literacy as digital information literacy (Bawden, 2008; Sparks et al., 2016) and other frameworks that place an emphasis on media literacy (Alexander et al., 2017).

Digital Literacy and Adult Education

The term adult education came into formal usage in the United States in 1926 with the establishment of the American Association for Adult Education. The formalization of the term initiated the development of comprehensive concepts and diverse activities that began the overall distinction of what is now known as adult education (Ross-Gordon et al., 2017). Adult education has evolved nationally and internationally. As early as the 1800s, the idea of adult education was a reality in practice and concept, but what it involved or represented was in dispute (Schmidt, 2014). Many scholars presented adult education as a broad concept that involved all adult learners over a lifetime of education. At the other end of the continuum, adult education was seen as a service offered to a specific population who has explicit needs (Belzer & Kim, 2018; Ross-Gordon et al., 2017). The concept of adult education included all adult learners who are engaged in formal and informal education; this would include learners in all levels of

higher education and continuing education. The definition at the other end of the continuum describes a group of adult learners who are offered basic instruction and educational services to adults who do not have postsecondary level credentials in the United States of America and English language instruction for nonnative speakers of English (Ioannidou & Knauber, 2019; Ross-Gordon et al., 2017).

Adult education programs in this study serve adult learners (16 years and older) by offering basic instruction commonly referred to as adult basic education (ABE) and English language instruction for nonnative speakers of English, commonly referred to as English as a second language (ESL; Schmidt, 2014). This adult population is also generally referred to in the research as the underserved (U.S. Department of Education, Office of Educational Technology, 2017) or vulnerable adults (Jacobs & Castek, 2018). Adult education has always been concerned with adult learners' acquisition of knowledge to improve themselves and their society (Belzer & Kim, 2018). In this digital age, adult education programs recognize that adult learners will need to be fully equipped to contribute and participate in their society. Adult education programs have evolved to meet the demands of the digital age, and digital literacy is a critical skill for improving the quality of life for all adult learners (Sharp, 2018).

A digital literacy initiative can be the nucleus of any adult education program. Approximately 38 million adults in the United States of America lack basic literacy (math, reading, language, and digital) skills (U.S. Department of Education, Office of Educational Technology, 2017). Digital literacy can open and increase access to education and educational services, provide a wide range of public and personal services,

and activate support for the way people work, communicate, and learn. The demands of the current digital era have changed how literacy is perceived, delivered, and diffused. It is not enough to acquire the skills of reading, writing, and numeracy. Adult education programs need to help adults "develop knowledge, values, and a wide range of critical thinking, communication, and information management skills" (Jimoyiannis, 2015, p. 214). Therefore, a digital literacy initiative will need to help adult learners develop digital literacy skills beyond the basic or simplistic concept to multifaceted competencies that truly empower the learner and impact the society. According to Jimoyiannis (2015), adult digital literacy skills can motivate adults to develop essential literacy skills, contribute to the knowledge economy by strengthening human capital, and bridge the digital divide, and increase digital equity and inclusion (p.219). Through a digital literacy initiative, adult learners can improve skills through practice and develop new capacities to match the ever-growing digital ecosystem.

An international survey of adult skills, Program for the International Assessment of Adult Competencies (PIAAC), was conducted of adults 16 to 65 to measure proficiency in the skilled area of literacy, numeracy, and problem-solving (Castek et al., 2017; Ioannidou & Knauber, 2019; Jacobs & Castek, 2018; Vanek, 2017). The survey gathered information on how adults used the measured skilled areas at home, work, and their community. The results from the survey revealed that adults in the United States were below the international average in all three skilled areas. Adults were assessed in problem-solving in technology-rich environments (PS-TRE). The PS-TRE evaluated the ability of adults to operate in technology-rich environments and demonstrate information

and communication capabilities that are reflective of the current digital era (Castek et al., 2017). The survey highlights the need for digital literacy training among the adult learner population and unveils the need for advancing training beyond basic digital literacy skills. Vanek (2017) describes how PS-TRE can be used to inform curriculum development and, ultimately, instruction. Vanek (2017) identifies three core areas that adult education programs need to address to help their adult learners acquire digital literacy skills and focus on developing relevant problem-solving skills. The three core dimensions are as follows: (a) task or problem statements, (b) technologies or devices to be used, and (c) cognitive dimensions or cognitive processes are employed to solve the problem (Vanek, 2017). All three dimensions require that adult learners learn an extended set of digital literacies. Acquiring the basic digital literacy skills will not be enough; applying critical thinking skills and asking how and why within the digital arena is imperative to building problem-solving skills in this digital era.

The Development of digital literacy skills in adult education programs is best supported when explicitly taught alongside academic content (Vanek, 2017). Focusing on problem-solving while developing digital literacy skills helps the adult learner to be fully engaged in knowledge acquisition and skills transmission and application (Jacobs & Castek, 2018). The extended set of digital literacies activated by adult learners give them contextual skills that will prepare them to solve problems they encounter in their everyday lives. Vanek (2017) encouraged adult educators to provide explicit instructions on digital literacies through problem-solving processes. Teachers need to directly instruct students where students plan, select, and employ these digital skills in diverse contexts.

The context must incorporate the three dimensions – task, technologies, and cognition so that students receive the full problem-solving experience and are pushed to employ the appropriate cognitive dimensions or technologies to the task given.

A digital literacy initiative prepares learners to acquire digital knowledge, skills, and develop an aptitude that will help them interact and contribute to this digital era (Adams Becker, Pasquini, et al., 2017). Digital literacy initiatives in adult education programs should be concerned with digital problem solving if they are to remain relevant (Vanek, 2017). Additionally, an equal emphasis must be placed on digital literacy skills development as well as adequate access to digital tools to promote digital transformation (Chetty et al., 2018). Digital literacy initiatives must seek to be multifaceted, comprehensive, dynamic, relevant, and adaptive. Preparing adult learners for full participation in this digital era on the national and international stage must be an authentic and intentional emphasis. Adult learners, through a digital literacy initiative, will be given "core capabilities to achieve valued outputs in life" (Chetty et al., 2018, p. 6). It should be a catalyst that transforms the adult learners' life.

Digital Literacy and the Digital Divide

Improving adult learners' digital literacy skills through a digital literacy initiative is central to bridging the digital divide and an attempt to fill the chasm created by the divide. The digital divide is no longer the gap between those who have access to digital technologies and those who do not (Anderson, 2019; Lee & Kim, 2019; Perrin & Duggan, 2015; Scheerder et al., 2017; (U.S. Department of Education, Office of Educational Technology, 2017). The issue of access that has prolonged the divide for

years is addressed with federal, state, and local programs to help minimize the gap. Broadband access has been made available through various programs such as The Broadband Technology Opportunities Program (BTOP) (Pendell et al., 2013). BTOP is a grant-funded program in association with the American Recovery and Reinvestment Act (ARRA) to promote the adoption of broadband throughout the United States to underserved and unserved people and areas (U.S. Department of Education, Office of Educational Technology, 2017). Additionally, considerable progress has been made to increase access to schools, libraries, and homes. With the increase in internet use, broadband adoption, and smartphone ownership, the digital access divide has narrowed significantly (Anderson, 2019). However, the chasm created by a lack of access is still present and has become intricate with the addition of more challenges (van Deursen & van Dijk, 2019), thus creating a new type of digital divide. The new digital divide describes individuals who lack access to technology, lack knowledge of digital technologies, and lack the ability to transmit acquired skills (Chetty et al., 2018; van Deursen & van Dijk, 2019).

This new digital divide cannot just be solved by providing access; more is needed to bridge gaps of knowledge acquisition and skills transmission that have contributed to the divide. Digital literacy initiatives can bridge the gap by ensuring that learners are able to activate, access, use, and readily apply all the benefits of current and future digital technologies. Adult learners in adult education programs who are impacted by the digital divide will need targeted digital literacy training to successfully navigate the digital era (Castek et al., 2017). To facilitate digital literacy training, adult learners will need access

to relevant, up-to-date technology, technical support, and connections which can be delivered through a digital literacy initiative (Chetty et al., 2018; Stryja & Satzger, 2019). One digital literacy model used the web-based learning platform called Learner Web to develop a tutor-facilitated digital literacy model for underserved and vulnerable populations (Pendell et al., 2013). This model provided access to technology – hardware and software and knowledge acquisition – assessments, training, and practice. Model implementers knew that basic digital literacy skills would not be sufficient to help adult learners navigate the current digital ecosystem and to prepare them to be digitally equitable and inclusive in this knowledge society. Consequently, Jacobs and Castek (2018) advanced the Learner Web model by proposing the need for adults to develop digital problem-solving skills.

Recognizing that the digital divide is more than just an issue with access, Jacobs and Castek (2018) explored a model that can help vulnerable adults bridge the digital divide and advance lifelong learning through digital problem-solving. Adult learners who actively engage in digital problem-solving display and acquire a set of practices that develop beyond basic digital skills. Adult digital problem solvers need an extended set of digital literacies that will include knowledge, application, and transmission of skills that can evolve in diverse digital ecosystems. A digital problem solver does not just interact with the digital world on a part-time basis; this engagement is a lifelong learning endeavor and an integral part of everyday life (Jacobs & Castek, 2018). Digital problem-solving strategies can address the knowledge acquisition and skill transmission gap because it places a demand on the learner to have a wide knowledge of digital tools that

can be applied across digital spaces, contexts, and practices (Jacobs & Castek, 2018). Also, through "funding, coordination, training, and staff resources," a framework is being developed through communities of learning to bridge the digital divide for this population.

Digital literacy is a central element for bridging the digital divide. The evolution of the access issue and the widening of the gap with issues of a lack of knowledge and application has launched a greater need for digital literacy initiatives. Developing sustainable programs and forging community partnerships are crucial. Chetty et al. (2018) suggest that the digital divide is characterized by limited and costly infrastructure and limited digital literacy. These two crucial problems go beyond national borders and impact vulnerable populations at an international level. Community partners, educational organizations, and government agencies can address the gap by allocating funds, targeting infrastructure, supporting digital policies, and implementing training and process improvement programs (Chetty et al., 2018; Delello & McWhorter, 2017). The access issue has been exacerbated by the lack of knowledge and a lack of skills transmission. Cultivating digital literacy programs geared towards developing the necessary skills is vital to digital literacy initiatives; however, Chetty et al. (2018) promote this type of digital transformation by suggesting that an equal emphasis must be placed on access as well as digital literacy skills development.

Digital literacy initiatives are the prerequisite to overcoming the challenges of the digital divide (Chetty et al., 2018; van Deursen & van Dijk, 2019). While access as an issue is on the decline, it has evolved into a new demand for a distinctive infrastructure.

Equal emphasis must be placed on access as well as digital literacy training if adopters and implementers hope to bridge the divide. Digital literacy initiatives should not only address the one aspect of the digital divide; adopters and implementers need to tackle all elements equally. Learners cannot be taught digital skills without utilizing digital tools, and these tools are available when access is provided. At the same time, making tools accessible without the necessary training is a recipe for failure (Chetty et al., 2018). Additionally, Chetty et al. (2018) called for a standardized digital literacy framework that encompasses the multidimensional and fluid nature of digital literacy. This framework can effectively address the digital divide if policymakers participate in a dynamic venture to continuously measure, apply, and develop programs that reflex the fluid nature of digital transformation. In adult education programs, digital literacy initiatives must not only address the digital skills to bridge the digital divide; they must place equal emphasis on all aspects of the divide.

Echoing Chetty et al. (2018), van Deursen and van Dijk (2019) addressed the issue of the digital divide in terms of access and the need to develop digital literacy skills at the same time. van Deursen and van Dijk (2019) presented the digital divide as first-level divide, second-level divide, and third-level divide. The first-level divide deals with physical access and a shift to material access. The second-level divide deals with skills and uses, while the third-level deals with outcomes. The study purports that the first-level divide has shifted from inequalities in physical access to inequalities in material access. This shift does not eliminate physical access but impacts the skills, uses, and outcomes. The proposal for equal emphasis on all aspects of the divide becomes meaningful in van

Deursen and van Dijk's (2019) study because they pointed out that digital skills, uses, and outcomes are consistently affected when access is lacking. Infrastructure, as well as training, must be provided; digital literacy training has to be dynamic, persistent, multidimensional, and ever-changing to remain relevant while attempting to bridge the digital divide.

Delphi Method

Reaching a consensus on the core components of digital literacy is essential to the development of digital literacy initiatives. The Delphi method is a method of inquiry that is used by many researchers to build the most reliable consensus of a group of experts on a specific topic (Dalkey & Helmer, 1963; Gallego & Bueno, 2014). For this study, the Delphi method was used to identify what experts agree are the core components of digital literacy initiatives for adult education programs because of the limited information available for establishing frameworks for this specific population. Through the Delphi method, a panel of experts will identify core components of digital literacy initiatives that will contribute to the development of frameworks, models, and guidelines for adult education programs.

History of the Delphi Method

The Delphi method was developed by the RAND Corporation and used in defense research for the United States government. The Delphi method can be traced as far back as the 1950s, when Dalkey and Helmer (1963) embarked on a project to forecast the impact of technology on warfare. Recognizing that the customary forecast methods at the time failed to provide an answer or solution to the problem, Dalkey and Helmer (1963)

developed the Delphi method (Dalkey & Helmer, 1963; Rowe & Wright, 1999). The Delphi method is an expert group communication process that is designed to conduct a comprehensive investigation and facilitate a detailed discussion on specific complex issues (Linstone & Turoff, 1975; Skulmoski et al., 2007). The researcher interacts with the expert group through a series of intensive questionnaires combined with iterative feedback and redistribution of questionnaires (Dalkey & Helmer, 1963) until a consensus is reached on the issue.

Essential Features of the Delphi Method

The aim of the Delphi method is to forecast trends in certain fields through a series of rigorous questionnaires and structured feedback until a consensus is reached. The essential features of the Delphi method are anonymity, controlled feedback, statistical aggregation, and iteration. Anonymity of the Delphi method participants is accomplished through a series of questionnaires that are administered privately. The participants do not interact with each other and are given the opportunity to express their opinions or expert judgments on the specific issue without group pressure (Rowe & Wright, 1999; Skulmoski et al., 2007). The controlled feedback is an organized summary of all the collective responses provided to the participants from previous iterations. This type of feedback allows the participant to read the opinions of the other anonymous participants and affords them the opportunity to gain perspective and either clarify or change previous responses (Okoli & Pawlowski, 2004). Delivery of the questionnaires through a number of rounds helps to fine-tune the opinions of the experts once they receive the feedback of the other participants. The iteration of the feedback also allows

the participants to revise or strengthen their opinions (Skulmoski et al., 2007). Statistical aggregation in the Delphi method is a summary of the groups' judgments after the final round (Rowe & Wright, 1999).

The Delphi Process

The Delphi process is a series of rounds and iterations until the expert group reaches a consensus. The size of the expert group varies from a minimum of seven upwards to thousands. The size of the participants or expert group can be determined by several of the following factors: for example, time, distance, finances, or the research question (Skulmoski et al., 2007). An expert group size between 20 to 30 should be able to provide a diverse perspective on the topic (Sekayi & Kennedy, 2017). However, a minimum of seven and a maximum of 15 may provide diversity and can be better controlled by the researcher (Linstone & Turoff, 1975; Rowe & Wright, 1999). Similarly, the number of rounds is not specified, but many researchers use a minimum of two or three and a maximum of five (Gallego & Bueno, 2014; Linstone & Turoff, 1975; Okoli & Pawlowski, 2004; Skulmoski et al., 2007). The first round of a Delphi instrument may consist of open-ended questions which are distributed to the expert group. In the Delphi, the first round can be unstructured, facilitating a more open response from the experts. The responses are analyzed and sorted into categories or themes. The summarized results are shared with the group along with a second, third, or fourth round of Delphi instruments combined with controlled feedback. While remaining anonymous to each other, the expert group can review, clarify, and or modify responses through the feedback process.

Sekayi and Kennedy (2017) explored a qualitative modified Delphi method using a four-round process. The study was conducted to present a modified qualitative Delphi method because an assessment of previous Delphi studies offered little guidance on the interim steps of the iteration process (Sekayi & Kennedy, 2017). The original purpose of the Delphi method - to obtain the most reliable consensus on specific topics – was always evident in the reviewed studies, but the methodology, especially after the first round, varied from study to study. Sekayi and Kennedy suggested a four-round process. The first round, just like most Delphi studies, consists of open-ended brainstorming on the topic. In the second round, the list of statements is presented to the participants, while in the third round, the final statements of the group are presented for endorsement. The final and fourth-round includes the lists of moderately and or strongly endorsed statements from the expert group. The researcher can then assess the statements from the final round to determine if the research questions were answered or if consensus was reached. The spirit of the Delphi method is present in Sekayi and Kennedy's (2017) exploration – seeking a consensus or judgment through group communication on a specific topic, but the rounds and iteration process differed. Like Helmer-Hirschberg (1967), Sekayi and Kennedy (2017) proposed a four-round Delphi with the fourth round being different. In the fourth round, Sekayi and Kennedy present findings while Helmer-Hirschberg allowed the experts a final chance to review statements. Helmer-Hirschberg's (1967) fourth and final statements represented the consensus of the group. Sekayi and Kennedy also presented two options for the fourth round, thus reverting to the idea that the Delphi process, since its inception, has been modified to complement the nature of the research

being conducted. The Delphi method is used by researchers to build a reliable consensus through group communication of a group of experts on a specific topic (Dalkey & Helmer, 1963; Gallego & Bueno, 2014; Pilcher, 2015;)

The principles of the Delphi method support research that seeks a consensus on a particular topic from a group of experts. The lack of consensus on core components of digital literacy initiatives makes the Delphi method a suitable and reliable decision-making tool (Gallego & Bueno, 2014). The Delphi method facilitates a comprehensive investigation method (Skulmoski et al., 2007) that targets the problem. The Delphi process is flexible in the way it allows modifications to complement the nature of the research. The overall objective of the Delphi method is reaching a consensus on the issue; therefore, it is a suitable research method for this study that focuses on identifying what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs.

Delphi Method and Curriculum Development

The Delphi method has been used in many fields of study, and education is no exception. Educators and researchers may use it for needs assessments, policy creation, resource utilization, curriculum development, program implementation, resource adoption, and resource utilization (Sekayi & Kennedy, 2017). In this study, I sought to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. Fang et al. (2018) used a modified Delphi method to develop a curriculum for teaching perioperative medicine. The study was motivated by the lack of a standardized curriculum for the residents in this

area of medicine. Fang et al. (2018) used a two-round Delphi technique in a five-step process. This modified Delphi method included two face-to-face meetings and one focus group to discuss the results of the survey from the two rounds of Delphi. The curriculum was needed in institutions nationwide, so modifying the Delphi method to include face-to-face meetings to facilitate discussions both online and in-person was necessary for the development of this curriculum. The Delphi method allowed the researchers to acquire contributions from a larger group of experts in the field and provided the focus group with ample materials to draft the curriculum and submit for feedback in the second round. Even though Fang et al. (2018) modified the Delphi method to include face-to-face meetings, Muñiz-Rodríguez et al. (2017) used a three-round process without any face-to-face meetings to identify core competencies.

Muñiz-Rodríguez et al. (2017) sought to identify the core competencies needed in a teacher education program in Spain. Teacher education programs in Spain do not provide the core competencies secondary mathematics student-teachers need to acquire during their teacher education training. The national education curriculum provided general guidelines, but it was not specific to any field. A review of international teacher education programs revealed that Spain was not experiencing a unique issue because other teacher education programs in other countries faced the same issue – especially in the field of mathematics. Like Fang et al. (2018), Muñiz-Rodríguez et al. (2017) used the Delphi method to seek consensus for different facets of curriculum development. Both sets of researchers hoped to distribute the consensus curriculum within their respective institutions and across the country to other institutions with similar programs. A lack of

consensus motivated these researchers to seek expert judgments on pivotal issues that inform the development of curricula.

Another group of researchers, Parekh et al. (2018), conducted research using the Delphi method to ascertain the core concepts that should be learned in cybersecurity courses. Cybersecurity is a fast-growing field the has a high demand for professionals, but it is not clear what foundational knowledge needs to be taught in the core courses. The data gathered from the Delphi process provided a foundation of the core concepts and established a starting point for course developers when developing curricula, learning exercises, and relevant course material. Parekh et al. (2018) used the Delphi method because there was a lack of consensus on what constitutes core concepts in cybersecurity courses.

Fang et al. (2018), Muñiz-Rodríguez et al. (2017), and Parekh et al. (2018) all used different versions of the Delphi method to lay a foundation and inform future curriculum development. The three studies utilized the many benefits of the Delphi method to standardize course offerings, core competencies, and curriculum advancements. Correspondingly, the problem presented in this research study exhibits the same lack of consensus found in the studies of Fang et al. (2018), Muñiz-Rodríguez et al. (2017), and Parekh et al. (2018). There is a lack of expert clarity and consensus on the core components of digital literacy initiatives in adult education programs. This lack of expert clarity and consensus on core components makes digital literacy initiative processes and efforts unequal across institutions and adult education programs (Alexander et al., 2017). The decision to use the Delphi method is to identify what

experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs.

Summary and Conclusions

In this chapter, I reviewed the literature associated with digital literacy initiatives in adult education programs. The review of literature began by exploring the origins of digital literacy, followed by a closer look at digital literacy initiatives and digital literacy frameworks, models, guidelines, and best practices. I culminated the review of digital literacy by examining digital literacy and adult education, and digital literacy, and the digital divide. The ubiquity of technology places a demand on educational institutions, communities, and programs to ensure that their learners are fully equipped to function in this technological age. Digital literacy initiatives are crucial to the development of digital literacy skills. However, in order for initiatives to have a successful and relevant impact, clarity and consensus on what constitutes digital literacy are necessary (Adams Becker et al., 2018).

The chapter also included a review of the literature on the concerns-based adoption model and the Delphi method and how they relate to the digital literacy initiatives in adult education programs. CBAM's IC dimension provides a framework for identifying the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. Similarly, the Delphi method provided a model that can be used to seek consensus on a variety of issues. In this literature review, the Delphi method was examined because of its overall objective in seeking and reaching a consensus. Chapter 3 includes information on the design of the study, the rationale for

seeking to conduct a Delphi study, the participant selection process, instrumentation, and procedures for collecting and analyzing the data.

Chapter 3: Research Method

Digital literacy initiatives support the acquisition and development of digital skills, relevant knowledge, and effective application of the wide range of competencies adult learners need to function in this digital era (Adams Becker, Cummins, et al., 2017). The purpose of this qualitative modified Delphi study was to identify what experts agree are the core components of digital literacy initiatives for adult education programs. This development sought to identify core components of digital literacy initiatives that contribute to the development of frameworks, models, guidelines, and strategies for adult education programs. Possible participants in this study were program administrators, program directors, program coordinators, curriculum and instructional coordinators, and other professionals who are involved in the development of digital literacy initiatives in adult education programs, departments, or divisions.

Research Design and Rationale

This research study was guided by the following questions:

Research Question 1: What is expert consensus regarding core components of digital literacy initiatives in adult education programs?

Research Question 2: How do experts explain and justify the Delphi-derived core components of digital literacy initiatives in adult education programs?

The focus of this qualitative modified Delphi study was to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. In this study, I sought to identify the core components of a digital literacy initiative that prepares citizens through the development

of frameworks, models, guidelines, and strategies in adult education programs. For this study, a qualitative Delphi method and not a quantitative method was appropriate. The exploratory nature of this study lends itself to the qualitative Delphi method (Sekayi & Kennedy, 2017) because I sought to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. The identification of core components cannot be determined with a numerical value because seeking what experts agree on will elicit subjective opinions and responses from the participant panelists (Murry & Hammons, 1995; Sekayi & Kennedy, 2017).

A quantitative method could not be used since I did not want to quantify the core components and determine the greatest among the components or generate numerical data which cannot be constructed from peoples' experiences of the world (Merriam, 2002). Likewise, case study, grounded theory, and phenomenology have merits as study designs within the qualitative method in answering the research questions. However, a case study would require a more in-depth study into more than one case in order to form an established process (Yin, 1984) for adult basic education programs. In the same light, grounded theory could produce a vast amount of data that can be time-consuming and difficult to manage (Glaser & Strauss, 1967). The discovery of emerging patterns in the data could provide valuable information adult education programs can use for the development of digital literacy initiatives. However, the data can be overwhelming and subjective, thus leading to difficulties in establishing reliability and validity of findings. On the other hand, phenomenology involves studying a phenomenon that is experienced by a group of people (Creswell, 2009). This method could enhance the understanding of

digital literacy initiative development in adult education programs and provide insight into practitioners of the initiative. However, this study sought expert consensus on the core components of digital literacy initiatives. The experience of practitioners would become more valuable once core components are identified, and the initiative is farther along in the implementation stage.

Qualitative research is a broad enough approach that encompasses a multitude of designs, such as the Delphi method. Qualitative research is the process of understanding human and social phenomenon. According to Creswell (2009), the qualitative approach explores and seeks to understand the meaning individuals or groups give to problems. Qualitative research with a Delphi method is a suitable and pragmatic design for this study. It has been used in the field of educational research (Sekayi & Kennedy, 2017) and provides an opportunity for the researcher to identify core components of digital literacy because a qualitative Delphi study can directly inform practice, policy, or decision making (Brady, 2015) that can provide clarity and consensus for adult education programs. The qualitative Delphi method retains all the values of the classical Delphi and enhances the tradition by "making room for a greater range of perspectives about a topic" (Sekayi & Kennedy, 2017, p. 2756). According to Sekayi and Kennedy (2017), a fully qualitative version of the Delphi study "can be used to gather perspectives for a broader purpose" (p. 2757).

The Delphi method was developed by the RAND Corporation for ascertaining the opinions of experts about specific problems (Pilcher, 2015; Thangaratinam & Redman, 2005). The Delphi technique can be used for both quantitative and qualitative methods by

virtue of its procedural structure (Greason, 2018) and aims to help researchers build the most reliable consensus of a group of experts on a specific topic (Sekayi & Kennedy, 2017). As a qualitative method, the Delphi technique is a versatile and powerful qualitative research methodology (Murry & Hammons, 1995) that allows the researcher to be flexible yet responsive to the purpose of the study and collection of data (Brady, 2015; Skulmoski et al., 2007). The aim of the qualitative Delphi method is to build the most reliable consensus of a group of experts on a specific topic (Sekayi & Kennedy, 2017). The strength of the method is its four characteristics of anonymity, iteration, controlled feedback, and statistical group response (Gallego & Bueno, 2014; Greason, 2018). "The Delphi method works especially well when the goal is to improve our understanding of problems, opportunities, solutions, or to develop forecasts" (Skulmoski et al., 2007, p.1). As a qualitative research design, the Delphi method is also appropriate when there is insufficient information available about a problem or trend (Skulmoski et al., 2007) and to bring together expert viewpoints for a broader purpose and consensus (Sekayi & Kennedy, 2017). The Delphi method also allows the researcher to collect data that can lead to a deeper understanding of the research problem and thus provide a firm answer to the research questions (Brady, 2015; Okoli & Pawlowski, 2004). The qualitative Delphi method was selected for this study to identify the core components of digital literacy initiatives for adult education programs.

As a research method of inquiry, the Delphi method is suitable for use in qualitative research studies (Brady, 2015), appropriate when there is insufficient information available about a problem or trend (Skulmoski et al., 2007), and lends itself

to written responses to the Delphi instruments from participants when seeking a consensus (Brady, 2015). The qualitative Delphi method also allows the researcher data that can lead to a deeper understanding of the research problem, provide a firm answer to the research questions (Okoli & Pawlowski, 2004), and help researchers to unveil and understand the meaning people have to construct to make sense of their world (Sekayi & Kennedy, 2017). The Delphi method was selected for this study to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs.

The qualitative Delphi method, through its iterations and development of a consensus on core components of a digital literacy initiative, provided an answer to the research questions and addressed the phenomenon being studied. Although the Delphi method is geared towards panels of experts, a well-noted limitation is finding a panel with the expertise needed to provide answers and reach a consensus (Brady, 2015; Okoli & Pawlowski, 2004). According to Okoli and Pawlowski (2004), this limitation is the most neglected part of the Delphi method by many researchers. Therefore, I sought to ensure the level of expertise of each participant by employing a purposive sampling process (Brady, 2015) to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs.

Another noted limitation of the Delphi method is attrition of participants. Donohoe et al. (2012) recommended the following to address attrition; selecting participants with high interest in the research problem and results, maintaining communication during data collection, and giving participants detailed information about

the processes, goals, and timelines at the beginning of the research. In following Donohoe et al.'s (2012) recommendations, purposive sampling was employed (Brady, 2015) when selecting participants to try to ensure that the experts were directly involved with the development of digital literacy initiatives in adult education programs. Detailed information about the research was provided to the participants in the recruitment email and the consent form. During data collection, constant communication was maintained with the participants during the three rounds of the study. In Round 1, interviews were used to determine the core components of a digital literacy initiative from each participant. The initial interviews were conducted over the telephone, by email, or via video call format (audio only). In Rounds 2 and 3, consensus was sought from the expert panelists on the combined list of core components in Delphi instruments that would inform the final list of core components.

Role of the Researcher

The main characteristic of a researcher is "to understand the meaning people have constructed about their world and their experiences" (Merriam, 2002, pp. 4-5). The researcher is the primary instrument in qualitative research and is central to the overall research process. The researcher is the key element in the study who investigates and gathers data, analyzes documents, interviews participants, and observes behavior (Creswell, 2009). The researcher must be an astute communicator in not only presenting the phenomenon of interest but also the collection and analysis of data, the presentation of the research purpose, and the posing and interpreting of the research questions (Ravitch & Carl, 2016). In this study, I was the only researcher who was personally

responsible for implementing all facets of the Delphi process. I was responsible for contacting all the participants, creating all the questions, collecting and analyzing all the data, summarizing all prior responses, returning group feedback to the participants, and decoding and interpreting all the findings.

In an effort to reduce bias on the part of the researcher, it is necessary to approach the data source with a neutral attitude and demeanor so that personal impositions would not be placed on the message of each participant. Self-reflection and self-evaluation can help to alleviate bias and create a neutral stance (Ravitch & Carl, 2016). A neutral stance is also necessary during the data collection process. The use of the Delphi method also helps to reduce bias in the way the method is designed to capture qualitative data (Skulmoski et al., 2007). The researcher has to provide the participants with a summary of all the responses in each round; this feedback component of the Delphi method, where the researcher shares all responses with the participants and provides the participants with an opportunity to confirm or change their responses allows for checks and balances in an iterative process (Pilcher, 2015). These checks and balances can help to reduce any bias on my part. The participants were given the opportunity to read, react, revise, refine, or reiterate their own statements.

Methodology

Participant Selection and Recruitment

In this study, I sought to ensure the level of expertise of each participant by employing a type of purposive sampling (Ravitch & Carl, 2016) to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and

consensus for adult education programs. A purposive sampling approach helps to maximize quality responses, reduce biases, build credibility, and strengthen panelist retention (Brady, 2015). The Delphi method calls for a panel of experts, so employing purposive sampling (Brady, 2015) to choose experts from adult education programs with knowledge of core components for digital literacy initiatives is important. An expert is any individual with relevant knowledge and experience of a particular topic" (Habibi et al., 2014). For the purpose of this study, experts included program administrators, program directors, program coordinators, curriculum and instructional coordinators, and other professionals who are involved in digital literacy initiatives. Another way to identify experts was to select presenters from national and state conference proposal committees or presenters who are digital literacy experts in their state or programs.

Finding a panel with the expertise needed is the most neglected part of the Delphi method (Okoli & Pawlowski, 2004). Therefore, I used a type of purposive sampling where the panel of experts was purposefully chosen and can provide "context-rich and detailed" information (Ravitch & Carl, 2016, p. 205) that answered the research questions. Purposive sampling has multiple strategies that will allow me to identify experts who are knowledgeable or have relevant knowledge and experience (Habibi et al., 2014) about the core components of digital literacy initiatives. Selecting a group of expert panelists with this approach helps to maximize quality responses, reduce biases, build credibility, and strengthen panelist retention (Brady, 2015). Initial panelists were recruited from my professional network within adult education programs, and additional panelists were identified through a key knowledgeable sampling strategy or a

snowballing approach. “Key knowledgeables can provide valuable expertise” (Patton, 2015 p. 670), and a snowballing approach is an excellent approach for “locating information-rich key” participants (Patton, 2015 p. 669) on the developing digital literacy initiatives. Snowballing is a sampling approach based on the recommendations made by participants, panelists, or experts who are recruited by the researcher (Nworie, 2011). Additionally, seeking recommendations from national and state conference proposal committees on presenters who are digital literacy experts in their state or programs was be another purposive sampling approach that was applied to the procedure for recruiting a panel of experts.

Okoli and Pawlowski (2004) recommended that the size of the Delphi panel of experts should be 10 to 20 experts. Similarly, other studies suggest using as few as three experts and as many as 300 experts (Rowe & Wright, 1999; Sekayi & Kennedy, 2017). Since there are no strict guidelines on sample size, I recruited 30 experts with the hope of getting a minimum of 20 experts and a maximum of 30 experts (Nworie, 2011; Pilcher, 2015) as my sample size. According to Nworie (2011), the more participants in a Delphi study, the more opinions, but large samples can be logistically challenging and time-intensive for the panelists as well as the researcher (p. 26). On the other hand, according to Hsu and Sanford (2007), a Delphi study with too small a sample size may not provide “a representative pooling of judgments regarding the target issue” (p. 4). Therefore, a sample size of 20-30 experts from various adult education programs generated “expected reasonable coverage of the phenomenon” (Patton, 2015, p. 704), given that I sought to identify what experts agree are the core components of digital literacy initiatives that will

provide clarity and consensus for adult education programs. If more than 30 participants agreed to participate in the study, I would have used them in the study in the event other participants were unable to complete all three rounds.

The participants were program administrators, program directors, instruction and curriculum coordinators, program coordinators, and other professionals involved in the process of establishing digital literacy initiatives in adult education programs across the nation. Participants were informed of the process and aim of the study from the beginning. Communication with participants was maintained throughout the process with frequent reminders of deadlines and follow-up with voice calls to inquire about the well-being of participants who seem to struggle to meet deadlines (Donohoe et al., 2012). Participants can leave the study at any time; therefore, if a participant left, I made an assessment of the remaining participants and my sample size. If I had more than the minimum sample size, then the study would continue. If the sample size were smaller than the minimum, I planned to continue recruiting participants in an effort to reach the minimum sample size.

Potential participants were contacted via email and were invited to participate in the study. I emailed the invitation to potential participants, or the invitations were a referral from program administrators, program directors, program coordinators, curriculum and instructional coordinators, and national and state conference proposal committees. The participants needed to be experts in the development processes of digital literacy initiatives in order to provide the core components; therefore, a referral helped to augment the selection of participants. If these referred individuals chose to be

participants, they would work with other experts and respond to a series of questions. Participants received the Delphi instruments via email (see Appendix B and C) in two iterations over a 6-week period for each round. They also received a summary of all responses during the second and third rounds so that they could review their responses and the responses of the other study participants.

Instrumentation

The first round of this qualitative Delphi study consisted of open-ended interview questions (see Appendix A). The first-round instrument was designed to "draw the attention of the panelists to the issues, problems or questions to be addressed" (Nworie, 2011, p. 25). An interview instrument was the best way to solicit from each participant the responses regarding core components of digital literacy initiatives. Then in subsequent Delphi rounds, consensus was sought from the experts regarding the core components provided individually in the first round. In the second and third rounds, I used Delphi instruments. The interview instrument was based on Patton's (2015) research on the centrality of interviews and their provision of "deep, rich, individualized, and contextualized data" (p. 224) that is important to the research. The first-round interview instrument was designed to gain insight into the panelists' experiences, understand how they developed digital literacy initiatives, and identify the core components that help to shape those initiatives.

Question 1 of the interview instrument was designed as a preliminary question meant to engage and understand the context, not to determine demographic characteristics. Questions 2, 3, and 4 were designed to address core components of digital

literacy initiatives. Question 2 addresses the definition of core components because the term may not be a standard term used with reference to digital literacy initiatives. The literature reveals that the concept of core components is referred to as elements (Belshaw, 2014; Jisc, 2019), competencies (Feerrar, 2019), or models (Alexander et al., 2016).

Therefore the aim of this question was to establish a common language. If panelists used an alternate term to "core components," that term was used in subsequent questions with the panelists. Question 3 was directly linked to the research question, and Question 4 asked panelists to review which steps and processes may have contributed to their core components of a digital literacy initiative because steps and processes form part of the people element of this innovation (Hall & Hord, 2015).

Question 5 addressed the definition of digital literacy, and question 6 looked at frameworks, models, guidelines, or best practices. Question 5 was written to address the definition of digital literacy. According to the literature, an accepted definition of digital literacy is foundational to the development of a digital literacy initiative because it supports the understanding of what constitutes digital literacy (Adams Becker et al., 2018; Alexander et al., 2017; Bawden, 2008; Belshaw, 2014; Feerrar, 2019; Johnston, 2020) and helps to guide the development of digital literacy initiatives. Question 6 addressed the use of frameworks, models, guidelines, or best practices that are used to develop digital literacy initiatives. The variety and complexity of the different frameworks are reflective of the disparity that exists in the field of digital literacy (Feerrar, 2019) and contributes to the lack of clarity and consensus in the field. If the

panelists use an alternate term to frameworks, models, guidelines, or best practices, that term will be used in any follow-up questions or probes.

Questions 7 and 8 were written to look at instructors and learners, respectively. Question 7 asked about instructor preparation and its relationship to core components. Instructors will be the disseminators of digital literacy and will need to have more than a cursory knowledge of digital literacy (Hord et al., 2014). Core components of any digital literacy initiative should address teacher preparation, which will provide consistent, clear, and tangible configurations of the innovation (Donovan et al., 2014; Towndrow & Fareed, 2015). Finally, Question 8 addressed the central element of a digital literacy initiative – learners. How learners acquire digital literacy is fundamental to digital literacy initiatives and can provide substantive core components that will be invaluable to the development process.

Procedures for Data Collection

Many researchers use a minimum of two or three and a maximum of five rounds (Gallego & Bueno, 2014; Linstone & Turoff, 1975; Okoli & Pawlowski, 2004; Skulmoski et al., 2007) when conducting a Delphi study. I used three rounds in this study. The first round consisted of open-ended interview questions (see Appendix A). Using open-ended interview questions is comprehensive and will elicit detailed information on core components from the participants (Brady, 2015).

Round 1

In the first round, I used open-ended interview questions and provided the participants with an opportunity to explore the topic of interest. This round was the

broadest and longest round (Sekayi & Kennedy, 2017). I transcribed the interviews and sent each participant a copy of their interview responses and a list of the components they provided in the interview to review for accuracy. Once the participants returned their reviews, I created a Delphi instrument for distribution along with a summary of all responses from all participants. Responses that did not align with the other responses in terms of main idea or theme after coding will be included in the summary because they are a part of all responses submitted, and "uniqueness of individual statements should not be sacrificed" (Sekayi & Kennedy, 2017, p. 2758).

Round 2

The second round included a combined list of components derived from the interviews and a Delphi instrument where participants were asked to rate the Delphi instrument items on a configuration scale of ideal to unacceptable (Hall & Hord, 2015) and provided a reason or explanation in narrative form for their rating. Participants were permitted to modify any items on the list and justify the modification. Once the responses were collected, the narrative responses were coded to identify categories, patterns, and themes in the responses. The coded narrative responses were summarized and sent to participants for their review in the third round. The configuration scale responses were grouped based on rating, and these results were sent to the participants for their review in the third round. The components rated ideal, acceptable, and less ideal were compiled to form a revised list of components in a third-round Delphi instrument that was distributed to the experts.

Round 3

The third round was the final round, and the responses and feedback were collected, coded, and analyzed to determine if consensus had been reached by the experts on the research problem. The generated coded Delphi instrument responses from the second round were distributed along with an endorsement list (Sekayi & Kennedy, 2017). Participants were asked to review the statements and add suggestions or any modifications if needed. The endorsement list had a list of components derived from grouping and counting of the components that are rated ideal, acceptable, and less ideal. I asked participants to endorse each statement as strongly, moderately, or minimally endorsed (Sekayi & Kennedy, 2017), and they provided a narrative explanation for their endorsement. The final checklist of components formed a part of the results section of the study and will be distributed to participants for use in their programs.

Data Analysis Plan

The precepts of the Delphi technique support the design of Delphi instruments that are sent to a select group of experts in two to five rounds until a consensus is reached (Sekayi & Kennedy, 2017; Skulmoski et al., 2007). I modified the approach and conducted an interview in round one over the telephone, by email, or via video call format (audio only) with a selected group of 20 to 30 experts in three rounds until they reached a consensus. The aim is to reach a consensus, but there may be an absence of consensus that may provide usable results (Sekayi & Kennedy, 2017) for this study. All responses from participants in all three rounds were analyzed and coded to identify categories, patterns, and themes in the data. Interview data were coded using in vivo coding and then descriptive coding to summarize the main topics and identify patterns,

themes, or categories. The same two types of coding were applied to the narrative responses to the Delphi instrument items and the responses given to the summations provided to each participant in the second and third rounds. The use of in vivo coding helped to preserve the responses of the participants because I used the participants' own words or phrases to summarize or label their responses (Saldana, 2016). In vivo coding provided a better understanding of the information each participant provides in their responses without me adding any personal interpretation initially (Saldana, 2016). The responses provided to the rated components in each Delphi instrument were grouped and counted to determine which components were given a specific rating. In the second round, responses to components rated as ideal, acceptable, or less ideal were used to create a new Delphi instrument. In the third round, responses to components rated as strongly and moderately endorsed were used to create the final list of core components.

Round 1

For the first round, interviews were transcribed, and participants received their transcripts and a list of the components they provided in the interview to review for accuracy. In vivo coding was applied to the interview data to identify patterns, themes, or categories. After this initial coding, I used descriptive coding in another coding cycle to summarize the main topics and identify patterns and themes from the first cycle of coding (Saldana, 2016) that contributed to the creation of the components' Delphi instrument for the next round and feedback in the form of summations of all responses from all the participants.

Round 2

The components Delphi Instrument had a configuration scale so that participants could use the components as ideal, acceptable, less ideal, or unacceptable (Hall & Hord, 2015) and explain in narrative form for each rate they chose. After the distribution of the second round, the components were grouped and counted to determine how many components were rated ideal, acceptable, less ideal, and unacceptable. The components that were rated ideal, acceptable, and less ideal were used to create the new components for the third-round Delphi instrument. For example, if a component was chosen by 10% or more of the participants as ideal, acceptable, or less ideal, it would be included on the new instrument as an item. If a component was chosen by 10% or more of the participants as unacceptable, it was not included in the new instrument. The narrative responses from the Delphi instruments were coded to identify categories, themes, or patterns. The narrative responses to the summation were also coded and compiled according to categories, themes, or patterns derived from coding. The results from the grouped and counted components, along with the coded narrative responses and responses to the summation, were presented to the participants in the third-round feedback.

Round 3

Based on the responses from the second round, I created a components list based on the components that were rated ideal, acceptable, and less ideal. The new instrument was a list of components, and panelists were asked to use a Likert scale ranging from strongly to minimally endorsed (Sekayi & Kennedy, 2017). The narrative responses to the items from the Round 2 instrument and the narrative responses to the summation were

coded to identify categories, themes, or patterns. The results from the endorsement list from the third round were grouped and counted to determine how many components were rated as strongly endorsed, moderately endorsed, and minimally endorsed. The components rated strongly and moderately endorsed were used to create the final list of core components. The components rated as minimally endorsed were labeled and added to the bottom of the list. They were not designated as core components, but they are components that may have value in future developmental efforts. The categories, themes, or patterns from the narrative responses and the narrative responses to the summation, along with the final list of core components, were presented in the results section of the study. At the completion of the study, arrangements will be made to provide participants with the final list of core components and the compiled results from the components instrument.

Issues of Trustworthiness

Ensuring quality, trustworthiness, and credibility in any qualitative research is a necessity for establishing its value and significance. This responsibility rests in the hands of the researcher, who can employ various techniques and strategies to safeguard quality, trustworthiness, and credibility in qualitative research. Enhancing quality, trustworthiness, and credibility means the preservation of data collection and analysis methods paying close attention to triangulation, validity, and reliability. Quality, credibility, and trustworthiness intersect because they all deal with the participant, researcher, and the reader (Patton, 1999), and many qualitative researchers use the terms

and or concepts interchangeably even when talking about validity. The rigor of the qualitative research study is paramount when assessing the quality, credibility, or trustworthiness (Ravitch & Carl, 2016). While validity is needed, it is not completely guaranteed, but there are strategies and methods the researcher can employ to increase rigor and develop trustworthiness.

Shenton (2004) explored four criteria that should be considered when trying to employ rigor and thus develop trustworthiness of the qualitative study. The four criteria are credibility, transferability, dependability, and confirmability. All applied four criteria help to ensure trustworthiness in qualitative research and thus maintain the overall quality of the research study.

Credibility

In pursuing credibility, the researcher needs to ensure that a "true picture of the phenomenon" (Shenton, 2004, p. 63) being studied is present, and there is truth in the findings. For example, the use of random sampling could reduce researcher bias and thus add validity to the study (Shenton, 2004). Researchers can be confident in the truth of the findings. Therefore, in this study, credibility was provided through the Delphi process. First, ensuring that the participants were experts on the topic adds credibility to the study (Okoli & Pawlowski, 2004). Seeking program administrators, program coordinators, program directors, and curriculum and instructional coordinators in adult education programs, and recommendations from national and state conference proposal committees on presenters who are digital literacy experts in their state or programs helped to ensure that the participants were experts and would, therefore, provide a "true picture of the

phenomenon" (Shenton, 2004, p. 63) and in turn credibility. The Delphi process added another layer of credibility through the iterative and feedback elements. After each round, feedback was provided to the participants in the form of summations of responses. In the second round, the participants were asked to rate the components' Delphi instrument on a configuration scale of ideal to unacceptable and provide a reason for their rating (Hall & Hord, 2015). Participants were permitted to modify any items on the list and justify the modification. Once the responses were collected, the narrative responses were coded to identify categories, patterns, and themes in the responses. The coded narrative responses were summarized and sent to participants for their review in the third round. In the third round, participants were asked to endorse each statement as strongly, moderately, or minimally endorsed. The participants were evaluating my interpretation and categorization of their responses presented in the Delphi instruments. Participants were asked to justify their choices and or modifications in narrative form; this reflected their level of agreement with my interpretation and provided corrections if needed. This helped to reduce researcher bias and added credibility. Finally, indicating their level of agreement with the consensus I identified on the final round helped to establish the credibility of the results.

Transferability

In addressing transferability, the researcher needs to show that the findings are applicable to other contexts by providing enough information for readers to make an informed decision about applying the findings to other settings. The production of true statements needs to be generalized yet still maintaining its applicability to the findings of

the study in question (Ravitch & Carl, 2016). In this study, I provided detailed descriptions of all processes within the research. Detailed, thorough description of the data collection, iterative rounds, feedback, analysis, and interpretation validated the transferability of this study.

Dependability

Dependability demonstrates that the findings of the study are reliable and can be replicated. One good practice to address dependability is to report in detail, thus ensuring enough information for future researchers of the phenomenon. In this study, I provided a comprehensive, thorough description of the research process. The Delphi process offers elements of triangulation and member checks. Triangulation entails seeking different perspectives through methods, data sources, researchers, and theories (Ravitch & Carl, 2016). In this study, the multiple rounds, feedback, and responses from participants afforded me the opportunity to follow up with participants and provided different perspectives. The feedback process provided member checks or participant validation (Ravitch & Carl, 2016) through the multiple rounds of the Delphi process.

Confirmability

Accomplishing confirmability can be difficult, but it is possible. Confirmability, like objectivity (Ravitch & Carl, 2016), can be achieved if the researcher ensures that "the work's findings are the result of experiences and ideas of the informants, rather than the characteristics and preferences of the researcher" (Shenton, 2004, p.72). In this study, I enhanced confirmability through an audit trail by carefully detailing how decisions are made at each stage, documenting the data analysis process, and proactively recording

responses as they were submitted while delivering feedback to participants as objectively as possible.

Ethical Procedures

I was the sole researcher of this study, and participation was voluntary. Once approval was received from Walden University's Institutional Review Board (IRB #04-01-21-0518040), I initiated contact with potential participants via email and sent out invitations to each participant, inviting them to participate in the research. Approved consent forms were sent describing the purpose and nature of the study with a brief description of participants' responsibilities. No incentives were used for participation, and no conflicts of interest or outside ethical issues were anticipated. Although it is expected for participants to complete all rounds of the study, they were informed in the written consent form that they could choose to stop at any time.

During data collection, participants' confidentiality was protected. Participants did not have contact with each other, and I kept the participants' names confidential by removing names and email addresses from all responses. Collected data were secured on a password-protected cloud account and drive and will be destroyed after 5 years. During the analysis, participants' identities and responses were kept confidential. If the need arises to provide context by mentioning names, code names were assigned and used.

Summary

Chapter 3 provided an overview of the research method of the study. The chapter begins with the research design and rationale, followed by the role of the researcher in the study. The section entitled methodology includes instrumentation, data collection, and

analysis plan. The final section presents issues of trustworthiness and addresses the ethical procedures of the study. In Chapter 4, I present the findings of the study. Detailed analysis and description of the results that emerged from data collection and analysis are presented.

Chapter 4: Results

The purpose of this qualitative modified Delphi study was to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs. This development sought to identify core components of digital literacy initiatives that contribute to the development of frameworks, models, guidelines, and strategies for adult education programs. To accomplish the purpose of this study, I focused on the following research questions:

Research Question 1: What is expert consensus regarding core components of digital literacy initiatives in adult education programs?

Research Question 2: How do experts explain and justify the Delphi-derived core components of digital literacy initiatives in adult education programs?

In this chapter, I describe the setting and how the recruitment process was conducted. I then provide participant demographics, data collection, and data analysis processes that led to the formation of codes, categories, and themes. I also address the evidence of trustworthiness, present the findings, and conclude with a summary.

Setting

Participants were not impacted by any personal or organizational conditions that may have influenced their experiences. There were 21 participants in Round 1, 20 participants in Round 2, and 20 participants in Round 3. All participants worked in adult education programs across the United States at different levels and in different capacities. They all had expert knowledge of digital literacy initiatives in adult education programs.

Participants were recruited via email invitations. After receiving IRB approval, recruitment emails were sent out spanning a 5-week period. In the first week of the recruitment period, 31 emails were sent out, and nine responses were received in the affirmative. By Week 4, over 70 email invitations and five reminders were sent out; 25 responses were received, with 16 in the affirmative, and nine interviews were scheduled. By the end of Week 5, 21 participants consented to participate in the study, and all interviews were scheduled. Over a 3-week period, 21 interviews were conducted, transcribed, and sent to all 21 participants in a staggered process for an accuracy check. The 21 participants returned the transcripts over a 6-week period; one reminder was sent to seven participants who received their transcripts at least 2 weeks or 3 weeks prior but had not returned their transcripts.

Demographics

The participants of this study were recruited from various adult education programs across the United States. The 21 participants in the study came from Georgia, New York, Minnesota, Arizona, Florida, Massachusetts, Illinois, Tennessee, South Carolina, and Chicago. The participants' experience with digital literacy initiatives in adult education programs spanned 3 to 30 years. Participants were vice presidents, program directors, state directors, program coordinators, state coordinators, training specialists, and conference presenters. Seventeen of the 21 participants were adult education instructors before being promoted to other positions in their respective adult education programs. The participants were assigned numbers (Participant 1 to Participant

21) once they consented to participate in the study. These numbers will be used to refer to the participants in the study. Participant 6 did not complete Rounds 2 and 3.

Data Collection

Data were collected in three rounds using a modified Delphi technique. The data were collected from 21 participants in Round 1, 20 participants in Round 2, and 20 participants in Round 3. The first round was an interview with open-ended questions based on the research questions. From the first round of interviews, I used the information collected from each interview to create the Delphi instrument for Round 2. Once the data from the second round was collected, the information from the responses and the participants' ratings, explanations, and justifications for their choice was used to create the Delphi instrument for the third round.

Round 1 of Data Collection

In the first round of data collection, open-ended questions were used in 21 interviews which spanned a 3-week period. Each transcript was transcribed, and each participant was sent a copy of their interview transcripts to review for accuracy. In each transcribed transcript, the components provided by the participant were highlighted. Highlighting the components was a deviation from the plan presented in Chapter 3, which was to send a list of the components they provided in the interview. I highlighted the components in the transcripts instead of sending a separate list. Based on the responses from each participant, 25 questions were created that addressed components for the Round 2 Delphi instrument (see Appendix B).

Round 2 of Data Collection

In the second round of data collection, a Delphi instrument comprising 25 statements to collect data was used. The Delphi instrument was sent to 21 participants, and I received 20 responses after 3 weeks. I waited 2 weeks for the last response, but it was never submitted. All participants were asked to rate the Delphi instrument items on a configuration scale of ideal to unacceptable and provide a reason or explanation in narrative form for their rating. Participants were also asked to modify any of the items on the list and justify the modification. The 20 participants provided the rating for the Delphi instrument items and provided a reason or explanation for most of the items. Some of the participants provided modifications to the Delphi instrument items, which were incorporated into Delphi instrument three if the modifications aligned with the research questions and the purpose of the study. When responses were not received after 1 week, a reminder email was sent requesting that participants provide their input. At the end of the third week and three reminders, 20 responses were received. One participant promised to respond the fourth week, but after 5 weeks, I prepared the Delphi instrument for Round 3 and sought IRB approval as it was a requirement for me to seek IRB approval for each instrument created.

Round 3 of Data Collection

In the third and final round of data collection, the Delphi instrument was comprised of 15 statements to collect data (see Appendix C). The Delphi instrument was sent to 20 participants, and 20 responses were received after 5 weeks. Weekly reminders were sent, and after 3 weeks, 14 of 20 responses were received. By the beginning of the

fourth week, 17 responses were received, and reminders were sent to the last three participants every 3 days. By Week 5, 20 responses were received. The 20 participants received the third Delphi instrument along with a compiled list of the second-round responses from the other participants in the study. Participants endorsed each statement in the Delphi instrument as strongly, moderately, or minimally endorsed. Some of the participants provided modifications to Delphi instrument items and an explanation for why they chose that particular rating for that item.

Data Analysis

Round 1 Data Analysis

Round 1 data analysis began after all interviews were transcribed. Each transcribed interview was copied to an Excel spreadsheet. The questions and responses were color-coded to differentiate between interviewer and interviewee. Two columns were created to begin the first cycle coding in one column and the second cycle coding in the second column. In vivo coding was used for the first level coding to preserve the responses of the participants and break down the data into distinct parts (Saldana, 2016). Following the first level coding, descriptive coding was used to enhance the codes from the first cycle and identify words and short phrases that would lead me to the topic or a category for that section of the data.

In the first cycle coding, the responses to the interview questions that were related to research question one was reviewed. The coding of the interview questions began with identifying what each participant was saying about their use or knowledge of core components. An inductive approach was used, and the data were searched for relevant

information about core components. When any pertinent information was found, the exact words were copied into the first cycle coding column. This process was repeated for all 21 transcripts. Following the first cycle coding, the data in the first cycle column was examined, and descriptive coding was employed to identify the words and phrases that summarized the data. The information was compiled, and it was used to create the statements for the Delphi instrument in Round 2. Based on 28 categories that were coded from the interview data, 25 components were created. The 28 categories reflected the following themes that emerged based on how the participants talked about components in a digital literacy initiative: access, curriculum, assessment, active engagement, training, and systems and support.

Round 2 Data Analysis

Round 2 data analysis began after 20 of 21 Delphi instruments were received. The Delphi instrument had 25 components (see Appendix B), and participants were asked to rate each component as ideal, acceptable, less ideal, or unacceptable (Hall & Hord, 2015) and give an explanation in narrative form for each rating they chose. The data from the Delphi instrument were copied to an Excel spreadsheet along with the corresponding narrative responses for coding and analysis. First, all the responses from the configuration scale were grouped, and the responses were organized to each component based on how they rated the component. The components that were rated ideal, acceptable, and less ideal were counted to determine consensus.

After grouping and counting the components to determine consensus, 100% consensus on 18 of 25 components was received, 95% consensus on four of 25, 90%

consensus on two of 25, and 85% consensus on one of 25 components (see Appendix C). Upon seeing the level of consensus, I continued the analysis by reviewing all the components, categories, and explanations given by the participants. First, the component with the 85% consensus was examined, and 12 participants rated it ideal, three rated it acceptable, two rated it less ideal, and three rated it unacceptable. The component with the low ratings was eliminated based on comments from the participants and the explanations from one participant who stated that the component was already a part of other components.

In continuing the close examination of components, the component that had a 90% consensus was reviewed– the content support component – Component 12 on the Delphi instrument for Round 2. This component received two unacceptables, one less ideal, eight ideals, and nine acceptables. A few participants commented that this component was addressed in other components, and nine of the 20 participants questioned its meaning and relevance as a standalone component. The analysis of Round 1 was reviewed, and it was noted that some participants mentioned content support while others talked about supporting learners in the curriculum through lesson design or instructional coaches. After that review, the content support component was eliminated. A similar close examination was completed, and components 15, 21, 23, and 24 were eliminated from the Round 2 Delphi instrument because their elements were already in other components (see Appendix B). Three components were merged under the access theme and three components under the assessments theme. Access remained as a theme even though it had one component because it was addressing three categories essential to

a digital literacy initiative – device, internet connection, and technical support. After eliminations and mergers, the Round 3 Delphi instrument had 15 components for the participants to rate.

Round 3 Data Analysis

Round 3 data analysis began after all of the 20 Delphi instruments were received. Round 3 Delphi instrument had 15 components (see Appendix D), and the participants were asked to use a Likert scale and rate each component as either *strongly endorsed, moderately endorsed,* or *minimally endorsed* (Sekayi & Kennedy, 2017). The results from the rated components were grouped, compiled, and assessed for consensus. After grouping and counting the components, it was noted that 100% consensus on seven of 15 components, 95% consensus on five of 15 components, and 90% consensus on two of 15 components were received. The analysis of Round 3 data continued with the examination of the explanations and justifications given by the participants for each component. The narrative responses, along with their corresponding component was copied to an Excel spreadsheet for coding. In vivo coding was used for the first level coding to preserve the responses of the participants, and the data was broken down into distinct parts (Saldana, 2016). Following the first level coding, descriptive coding was used to enhance the codes from the first cycle, and repeated words, short phrases, or concepts by the participants were identified. Data from the descriptive coding was used to identify categories and then themes in the participants' responses. The following themes identified in Round 1 were enhanced in Round 3: access, curriculum, assessment, active engagement, training, and systems and support.

Evidence of Trustworthiness

Credibility

In pursuing credibility, I confirmed that a "true picture of the phenomenon" (Shenton, 2004, p. 63) being studied was presented. First, the level of expertise of the participants was confirmed during the recruitment process and after asking the first interview question in Round 1. All 21 experts were either program administrators (vice presidents), program coordinators, program directors, curriculum and instructional coordinators, and conference presenters in adult education programs, who are digital literacy experts in their state or programs. All the participants' experience with digital literacy initiatives in adult education programs spanned 3 to 30 years. Most of the participants were instructors in an adult education program before being promoted to other positions in their respective programs. These participants brought another perspective to the discussion on core components of a digital literacy initiative for adult education programs.

Another confirmed element in ensuring credibility was through the iterative and feedback element of the Delphi process. After each round, transcripts and feedback were provided to the participants in the form of an accuracy check-in Round 1 and summation of responses for Round 2. Participants were also permitted to modify items during Round 2, and that information was shared with all the participants in Round 3. Also, in the final round, participants were asked to indicate their level of agreement with the consensus identified on the final Delphi instrument.

Transferability

Transferability is the ability of the researcher to show that the findings are applicable to other contexts by providing enough information for readers to make an informed decision about applying the findings to other settings (Miles et al., 2014). Since the purpose of this modified Delphi study is to identify what experts agree are the core components of digital literacy initiatives that will provide clarity and consensus for adult education programs, then the findings from this study can be applied to other programs that serve this category of adult learners. I provided detailed, thorough descriptions of the recruitment process, data collection, iterative rounds, feedback, analysis, and interpretation of the findings.

Dependability

Dependability was addressed through the consistency of the findings and a thorough description of the research process. The feedback process, member checks, and or participant validation (Ravitch & Carl, 2016) through the multiple rounds of the Delphi process allowed me to follow up with the participants of the study. The immersive elements (Thangaratinam & Redman, 2005) of the Delphi process allowed me to closely interact with the data during the iteration of the rounds – analyzing the data after Rounds 1 and 2 to create the statements for Rounds 2 and 3 Delphi instruments. This data collection process and analysis of data are carefully recorded so that future researchers can understand, follow, and conduct future research.

Confirmability

The objective of confirmability is to show that the results are those of the participants. I carefully documented each round of the Delphi process, the data analysis process, recorded the responses of each participant in every round, and delivered feedback to participants. Participants were given the opportunity to check for accuracy in Round 1 and confirm their responses in Rounds 2 and 3.

Results

The findings provided answers to the two research questions in this study. Expert consensus on core components of digital literacy initiatives in adult education programs is that the core components must address certain operational features to develop a digital literacy initiative. The core components should focus on the following six themes: access, active engagement, systems and support, training, assessments, and curriculum. The experts agreed upon 15 components that fall under one of the six themes. In Round 1, an interview was conducted to determine what the 21 experts believed were the core components of a digital literacy initiative. Experts shared their experiences in adult education programs with regard to digital literacy. After analyzing and coding the interviews, 28 categories were identified that experts offered as essential features of a digital literacy initiative in adult education programs. The 28 categories were used to create 25 components for the Round 2 Delphi instrument (see Appendix B). After collecting and analyzing the data from Round 2, the data was used to develop 15 components for the Round 3 Delphi instrument (see Appendix D).

The six themes emerged after the 28 categories were identified in Round 1. No new themes emerged after Round 1. The themes identified in Round 1 were confirmed in Rounds 2 and 3 (see Table 1 for the 28 categories and the six themes).

Table 1

Categories: Coded Responses from Round 1 with Themes

Themes	Categories: Coded Responses from Round 1
Access	Access to a device Access to internet connection Access to technical support
Assessments	Needs Assessment of teachers Needs Assessment of the adult education program Need Assessment of learners Assessment and evaluation protocol
Training	Knowledgeable teachers Professional Development Opportunities to engage with colleagues Professional learning communities.
Curriculum	Align Curriculum Embed, Integrate, Infuse Curriculum
Active Engagement	Ample opportunities to apply skill Continuous learning activities
Systems and Support	Embed digital technologies in planning Enhance academic learning outcomes Critical thinking, cognitive skills Effective structures and support systems Effective routines and processes Confidence, Competence, Courage Include content creation Incorporate problem-solving Content support Learning ecosystem Instructional coaches Valuable collaborations Mindset, metacognitive and meta-learning strategies and activities

Access

All participants stated the importance of access in a digital literacy initiative. They proposed access to devices and digital technologies, internet connection, and technical support. Three of the 28 categories coded from Round 1 responses addressed the issue of access; three categories were used to create three components in Round 2 to represent each category. For the Delphi instrument in Round 3, the three components were merged into one component, and access remained as a theme because it still addressed three categories and essential features of a digital literacy initiative. In Round 2, the three components were agreed upon by 95% of participants for devices, 95% for internet connection, and 85% for technical support. In Round 3, the merged component under the access theme received 100% consensus.

According to the participants, access to a device is essential for any digital literacy initiative. Some participants made sure to emphasize up-to-date devices due to the constantly changing landscape of digital literacy, while others were more general in the type of devices because funding varies from state to state and in adult education programs. There were participants who wanted more specificity with the core component of access, specifically the access to devices. Participant 16 suggested the following rewrite of the component about access to devices, “Ensure that all learners, teachers, and other participants in the digital literacy initiative have comfortable and routine physical access to an up-to-date, well-functioning device or other digital technologies both within and outside of formal learning environments.”

Participant 16 also gave this component a less than ideal rating. Other participants wanted clarification of the type of access in terms of device and also location (home or classroom). To clarify, I referred them to the definition of a core component that was used in Round 1 and emphasized that a core component needed to be broad because specific access would be defined by the individual adult education program according to their local funds, policies, and program processes. Participant 9 rated this component as an ideal component but carefully noted that this component "could be hampered by local policies, tight budgets, and the effort it takes to manage a technology loaner program." Local programs will add variations to each component that will reflect their local procedures.

Access to internet connection was another category of the access theme that received 95% agreement in Round 2. Participants suggested that I specify the type, quality, and location of access - for example, "have reliable high-speed broadband access to the internet at school and at home." The feedback was the same as the one given for access to devices, and many of the participants offered variations to the component in the explanation and justification section of the Delphi instrument, as noted in Table 2.

Table 2

Explanation for Component 2 Rating (Round 2)

Participants	Explanation and Justification
Participant 1	Internet access is non-negotiable.
Participant 2	Again, the ideal situation is that they have internet access on campus.
Participant 3	Yes, affordable high-speed internet is needed for all. It's a human right!
Participant 4	Again, this is based on resources. If a program can provide hot spots or partner with an agency to provide secure Internet connections, that would be ideal.
Participant 5	Internet is an important part- internet uses research capabilities for jobs, online activities, software, supplemental, and a host of other purposes.
Participant 9	This is doable based upon the number of low-cost options through other social service agencies. Rural areas may be harder to ensure.
Participant 10	In order to compete and be competitive in the job market or to complete a higher level of education, Internet access is vital.
Participant 12	Internet connectivity is a matter of equity when it comes to digital literacy. We must ensure that all learners have access, not just those who can afford it.
Participant 13	Even if the access is provided off-site where participants have free access, this is a necessary step. Participation with an appropriate device without internet connections is not reasonable.
Participant 15	Without access the initiative will not proceed successfully.
Participant 14	This is ideal, but not possible in some areas where there is no broadband network. It is unfair to ask that adult education be responsible for laying infrastructure
Participant 17	Reliable internet needed for successful implementation
Participant 18	Being able to connect to the Internet is part of being a citizen in this country. Adults need to have access to the Internet for work, school, and as a member of their community.
Participant 19	So much of digital literacy occurs on web-based applications now. Internet connectivity is vital.
Participant 20	Devices and access are 2 of the 3 components needed for digital equity. (Skills is the other.)

Note. Component 2 was “Ensure that all learners, teachers, and other participants in the digital literacy initiative have access to Internet connection.” (Round 2). Participants 21, 7, 8, 11, 16 were not included on this table. The included participants rated this component as ideal.

During Round 1 interviews, several participants noted how the COVID-19 pandemic of 2020 magnified the need for internet access among adult learners in the adult education program. Many programs that did not have the funds to provide students with individual connections found creative ways to help students identify where they could get access to different types of internet connections. The explanations in Rounds 2 and 3 are representative of the general agreement about the importance of access. Participant 14 rated the component as ideal but stated, “This is ideal, but not possible in some areas where there is no broadband network. It is unfair to ask that adult education be responsible for laying infrastructure.” Participant 8 stated that this component was too expensive but necessary, even though Participant 4 declared that adult education programs could partner with companies to help provide access to students. Participant 21 who did not rate the component as ideal, added that the component seemed inadequate and wanted the digital literacy initiative to have a higher standard. Participant 1, 10, 17, and 19 provided an appraisal of the general believes of the participants by stating the following: “internet connectivity is vital,” “it’s a human right,” “reliable internet [is] needed for successful implementation,” [of a digital literacy initiative]. “In order to compete and be competitive in the job market or to complete a higher level of education, Internet access is vital,” [and] “Internet access is non-negotiable.” Access to an internet connection is a vital part of a digital literacy initiative.

Access to technical support received 85% agreement in Round 2. The three participants, Participant 5, Participant 16, and Participant 9, who rated this component as less ideal, provided an explanation for their rating. Participant 16 stated that the

component was too vague and that technical support should be “friendly and work to teach troubleshooting skills to reduce dependence.” Participant 5 added, “It would be difficult to have all students, classified, and teachers to have full access to technical support. It would be more ideal for teachers to have full access to help students.” And Participant 9 stated, “I think we should help when we can, but we cannot be the technology experts for every device, connection, website, or software program that’s out there. What we can do is refer them to the appropriate information source.” These three participants offered a rating and a perspective that was different from the other 17 participants, but their explanations strengthen the need to establish core components that are broad and can fit any program. If an adult education program can afford to establish technical support at their site, then they have provided access to technical support. On the other hand, if the adult education program can only give students information on how to access technical support from an outside agency, then they have also provided access to technical support. Likewise, adult education programs may want to teach students how to identify and describe any problems they may be having; as Participant 14 stated,

> The programs should either provide basic technical support, or help connect learners to technical support elsewhere. This may include instructing them on what information tech support needs, how to describe the problem, and or call with them to help navigate the system

Access to technical support is essential to the digital literacy initiative, and as Participant 15 acknowledged, without technical support, the digital literacy initiative will not succeed. Eight of the 20 participants agreed that access to technical support is critical,

and adult education programs should strive to help students learn to develop problem-solving skills along with accessing this resource.

Curriculum

All participants stated the importance of a curriculum in a digital literacy initiative and stipulated that the curriculum needed to be aligned to the general education curriculum and integrated, infused, or embedded. The general consensus was that a digital literacy initiative should begin with a curriculum that was already designed and add or combine several curricula to create one that was suited for their population and program needs. Additionally, the digital literacy curriculum should be embedded, integrated, or infused in the adult education program general education curriculum. Two of the 28 categories coded from Round 1 responses addressed the curriculum theme, so I used the two categories to create two components in Round 2. The two components were agreed upon by 85% of participants for align curriculum and 90% of participants for embed the curriculum. In Round 3, the same components were agreed upon by 90% of participants for align curriculum and 100% of participants for embed curriculum.

In Round 2, Participant 16, Participant 17, and Participant 20 rated the aligned curriculum (referring to one course) component as less ideal and explained their rating by stating that the curriculum is already aligned to the college and career readiness standards and that,

> No one curriculum is going to fit everyone's needs, and a "digital literacy curriculum" implies digital skills are being developed in isolation as part of direct instruction. While this is important for certain skills, supporting instructors with

> resources and training that supports them in effective tech integration should be the goal.

Participant 3 countered this comment and said, “I think the curriculum needs to be responsive and living, not static and fixed. The most consistent element in the digital world is change therefore our approaches to teaching and learning need to be responsive to change.” Participant 11 supported the idea of an aligned curriculum and said,

> If it doesn’t contextually fit with and support current AE goals, the initiative is less likely to be accepted, implemented, and sustained by the organization. However, alignment of the digital literacy curriculum with the current AE GMV increases its probability of success.

In Round 3, Participant 20 rated the aligned curriculum component as minimally endorsed and stated,

> While direct instruction of digital literacy skills is effective and more resources are needed for providing direct instruction, a one-size-fits-all “curriculum” for digital literacy is not the most critical component. Rather, curriculum that provides sensible, realistic guidance for the integration of digital skills within content areas, and guidance for how to make explicit skills connections, is both more helpful and more likely to be utilized by teachers who don’t feel they have time to “stop” what they are doing to focus solely on digital skills.

An aligned digital literacy curriculum cannot be a one-size fit all; therefore, the adult education programs will need to research, identify, and align or design a digital literacy curriculum with the goals, mission, and vision of the adult education program.

In Round 1, almost all the participants stated that the digital literacy curriculum must be integrated, embedded, or infused. I chose to use the word embed in the component. In Round 2, Participant 14 and Participant 16 rated this component as less ideal and offered the following explanation for their rating: Participant 16 said that this was an excellent component, but it needs more "specificity- Who? How? And Participant 14 noted that sometimes "digital literacy is a stand-alone class, not embedded into other courses." Other participants supported the idea of embedding curriculum in Rounds 2 and 3. They asserted that digital literacy should be embedded in all teaching and learning since it is a vital workplace skill. Participant 11 stated,

> This is ideal because the average teacher is already overwhelmed and feeling inundated with a million things. If you can blend it into what they already do (or find a way to market it as something that can help them do what they're currently doing more effectively) they will be more receptive of its implementation.

Participant 3 suggested that the curriculum "needs to be embedded into the learners' life and goals," and this was endorsed by Participant 14, who stated that digital literacy should be a natural part of the learning experience, no matter the topic. Participant 12 added, "Embedding digital literacy skills in a meaningful and relevant context helps learners acquire new skills and knowledge by developing their abilities and attitudes." Curriculum is an essential component, and since digital literacy is part of everyday life and work, it should be embedded across the curriculum.

Assessment

The assessment theme was created after analysis revealed that all the participants used terms like pre-assessment, evaluation, survey, needs inventory, skills assessment, skills inventory, pretest, and needs assessment. Four of the 28 categories coded from Round 1 responses applied to the assessment theme. In Round 2, I created four components, and each component was agreed upon as follows: 95% of participants for needs assessment of teachers, 85% of participants for needs assessment for the adult education program, 95% of participants for needs assessment for learners, and 95% of participants for assessment and evaluation protocols. After analyzing the data from Round 2, I merged three of the components into one, and so, for Round 3, the assessment theme had two components. The two components were agreed upon by 100% of the participants for assessment and evaluation protocol and needs assessment of learners, teachers, and adult education programs.

The topic of assessment was usually introduced in the Round 1 interview after a participant shared how they would or have started a digital literacy initiative in adult education programs. They talked about assessments in their response to Question 4 on the interview protocol – *"*Bring to mind the steps and processes you used to develop digital literacy initiatives? As you reflect on the steps and processes, what core components emerge?" Most participants talked about assessment of the learners first, then the teachers to determine teacher professional development. Assessment or inventory of the adult education program was only mentioned by eight of the 21 participants. The eight participants were current vice presidents of adult education programs or past vice

presidents of adult education programs. In Round 2, Participant 16, Participant 14, and Participant 21 did not agree with the needs assessment of an adult education programs and rated the component as less ideal and unacceptable. Participant 21 stated,

> This needs to be made clearer. Do you mean what it implies – a needs assessment of the whole adult education program and all its various components – or do you mean something else, for example, "a digital literacy needs assessment of learners (or teachers, tutors, and learners)"? My guess is you mean the latter, but that isn't what this says.

Feedback given in Round 2 clarified this statement. Based on data from Round 1, participants stated that a needs assessment of the adult education program was needed to determine the needs of the program apart from the learners and teachers. According to Participant 20, the needs assessment of an adult education program is needed because it is "critical to understand the capacity of the organization to serve or accomplish its goals around digital literacy." Participant 17 added that the program "can better plan and prepare if needs are known." The consensus among the eight participants was that an adult education program needed to identify the resources the program had and what resources were needed to serve the digital literacy initiative effectively.

Participant 5 stated, "Needs assessment can allow us to dissect what our strengths and weaknesses are within our program to then provide a plan of action to address those needs." And Participant 12 added, "A comprehensive needs assessment of adult education programs, sites, or locations should be conducted to ensure that digital literacy

is at the forefront in every classroom." Following the feedback from Round 2, the needs assessment component was agreed upon by 100% of the participants.

The assessment and evaluation protocol component was agreed upon by 95% of the participants in Round 2. Participant 21, who rated it less ideal, asked,

> Is this component an evaluation of the success of the digital literacy initiative, or do you mean assessing and evaluating the digital literacy skills the teachers, tutors, and adult learners have acquired, or both? A protocol is an evaluation tool, which suggests that you mean a way to assess teachers, tutors, and/or learners. Is that what you mean here? Do you also mean establish an "evaluation design" to determine the success of the initiative? If so, that needs to be made clearer.

This component is both an assessment protocol and an evaluation protocol. Instead of separating it into two different components, I combined it based on the data from Round 1. Several participants (Participants 5, 12, 13, and 19) stated the following in support of the assessment and evaluation protocol component: Participant 19 stated, "All program initiatives should have assessment protocols built into them." Participant 12 added, "Assessing digital literacy initiative will not be easy; however, building digital literacy assessments help build a habit of thinking critically about the digital world." Participant 13 stated, "This is vital for individual evaluation and for determining ongoing program-wide improvements to make." And Participant 5 stated, "This is important so you can collect feedback and determine what changes, if necessary, need to be implemented in the program for greater growth or improvement with digital literacy." According to Participant 17, this component will enable programs to "track progress to determine if

initiatives are successful." The assessment components are vital to a digital literacy initiative. Assessments are integral to an education initiative and can help adult education programs identify gaps, plan effective activities, and enhance student learning.

Active Engagement

The active engagement theme was created based on the following coded responses from the data collected in Round 1: ample opportunities to apply skill and continuous learning activities. These coded responses were very specific for the learners, even though all the components of a digital literacy initiative are geared towards the learners. Two of the 28 categories coded from Round 1 responses addressed the active engagement theme. In Round 2, I created two components, and each was agreed upon as follows: 85% of the participants for the ample opportunities to apply skill component, and 90% of participants for the continuous learning activities component. In Round 3, the two components in the active engagement theme were agreed upon by 100% of the participants.

The active engagement theme of a digital literacy initiative promotes the idea that the learner must be an active constituent in a digital literacy initiative. When commenting on the continuous learning activities component, Participant 17 stated that the digital literacy initiative will have "better outcomes with continuous practice in relevant activities." Participant 13 agreed with Participant 17 and stated,

> Students and even teachers will think of digital literacy as just being able to navigate hardware or software or websites unless we clearly show how digital

> literacy covers a much broader set of skills, such as evaluating sources, etc. I think this has to be continually and intentionally taught.

Participant 12 added, “Promoting, providing, and committing to continuous learning activities that reflect a wide range of digital literacy competencies, tools, and problem-solving skills for digital literacy acquisition plays a critical role in successful learning for adult education students.” In Round 3, Participant 13 continued support for the component and added, “continuous opportunities are important to help cement the learning for participants, and a wide range of competencies and tools is important to make the initiative as relevant as possible to as many participants as possible.” Promoting, providing, and committing to continuous learning activities in a digital literacy initiative is a critical element in the digital literacy acquisition process.

Participant 19 supported the idea of providing ample opportunities for students to apply digital literacy skills in support of content learning and stated that “digital literacy skills should be a part of every learning experience.” Providing ample opportunities will “foster practical application and reinforce learning,” said Participant 1. Participant 11 continued by adding that “application of content knowledge is essential. The only way to truly gauge this is by providing sufficient opportunities for students to apply the learned knowledge.” “Incorporating digital literacy skills into content learning is ideal,” declared Participant 14. Accordingly, “this contextualized instruction of digital literacy is vital to help students understand its value, its relevance, and its scope,” stated Participant 13. Providing ample opportunities for students to apply digital literacy skills in support of

content learning confirms the idea that learning always happens in context and supporting ways of application can encourage student growth.

Training

The training theme was created because of the following four of the 28 coded responses from the data collected in Round 1: opportunities to engage with colleagues, knowledgeable teachers, professional development, and professional learning communities. Based on the four categories, I created four components that were reflected in the training theme, which dealt with professional development, collaboration, and forming a community. In Round 2, each of the four components was agreed upon as follows: 95% of participants for opportunities to engage with colleagues, 75% of participants for knowledgeable teachers, 95% of participants for professional development, and 95% of participants for professional learning communities. After analyzing the data from Round 2, I deleted two of the components for the Round 3 Delphi instrument. The component about knowledgeable teachers was deleted because it was agreed upon by less than 80% of the participants. Upon closer examination, the component about opportunities to engage with colleagues was already included in another component, so I also deleted it. In Round 3, the training theme had two components, and 95% of participants agreed upon each component – professional development and professional learning communities.

Participants (Participant 3, 5, 9, 11, 12, and 14) who supported the professional development component and the professional learning community component believed that “digital literacy is constantly changing, so instructors need to be kept up-to-date.”

Therefore, “adult education programs should provide ongoing professional development to ensure that teachers’ digital literacy skills keep up with the constantly changing nature of technology.” “Digital training has to be targeted and relevant, or it won’t “stick” or be used.” “Having a [learning] community can help increase the digital learning innovation” and “provide an opportunity and a community where instructors can share their ideas, strategies, and implement new processes to help students.” “These communities connect learners and learning together in a sustainable system toward healthy mindsets for learning today, tomorrow, and into the future. The shape the learning community takes can vary and take different shapes and forms.” Training is a fundamental part of an initiative and facilitating targeted training and providing ongoing opportunities can aid the implementation process and keep a digital literacy initiative responsive to the needs of the adult learner.

Systems and Support

The systems and support theme includes components that addressed the digital literacy initiative in a general way or addressed all or some of the five other themes. The components listed under the systems and support theme could not be placed under any one of the previously stated themes, so after analysis, I concluded that these categories which I used to create components were operational features of the digital literacy initiative overall and included aspects of several other themes and categories in the initiative. The systems and support theme is broad enough to capture several interrelated categories and all the participants (learners, teachers, stakeholders, and implementers) of the digital literacy initiative

Each participant provided components that addressed all the six themes. For example, one component under the systems and support theme was “Encourage confidence, promote competence, and support courage of all participants within a digital literacy initiative.” Participant 21 presented the three words confidence, competence, and courage in the interview and called it the 3Cs. Participant 21 often shared the 3Cs with teachers when talking to them about digital literacy. Also, 15 of the 21 participants talked about one of the 3Cs when referring to students, teachers, coaches, and the digital literacy initiative or the adult education program. Although the participants did not mention the 3Cs together, they all talked about the same concept using one or two of the words during the interview. Based on the data, I placed the component in the systems and support theme because it applied to learners, teachers, other initiative participants and could be placed under two or more themes. The 3Cs component has certain threads from different themes that can be applied to the theme of active engagement, training, and curriculum.

After coding and analyzing the data from Round 1, I placed 13 of the 28 categories under the systems and support theme. I used the 13 categories to create ten components in Round 2. After coding and analyzing the data from Round 2, I merged and eliminated four components based on the explanations and justifications section on the Delphi instrument. For Round 3, the systems and support theme had the following six components created from 8 of the categories from Round 1 (see Table 3).

Table 3

The Categories and Components of the Systems and Support Theme

Systems and Support Theme	
Category	Components
Embed digital technologies in planning.	Integrate and embed digital technologies in planning and designing learning environments and experiences for learners.
Enhance academic learning outcomes. Critical thinking, cognitive skills Include content creation	Systematically plan digital literacy activities that align with digital technologies that enhance academic learning outcomes, content creation, problem-solving, and critical thinking.
Learning ecosystem.	Facilitate the construction of a learning ecosystem where digital literacy skills acquisition, development, and transmission will thrive.
Confidence, Competence, Courage.	Encourage confidence, promote competence, and support courage of all participants within the digital literacy initiative.
Instructional coaches.	Empower and develop instructional coaches (change agents or change facilitators) who will guide the implementation of the digital literacy initiative at the teacher and student level.
Mindset, metacognitive and meta-learning strategies, and activities.	Promote, facilitate, and engage in metacognitive and meta-learning strategies and activities within the digital literacy initiative.

Under the systems and support theme, 95% of the participants agreed upon four of the six components, and 100% of the participants agreed upon the component with three merged categories and learning ecosystem component.

Even though 100% of participants agreed upon the learning ecosystem component, they offered varied explanations and justifications for their rating. Participant 3 was unsure about the idea of constructing an ecosystem and stated,

> I'm not sure that an ecosystem can be constructed, but instead, pay attention to the idea of systems thinking that every piece has an effect on another piece within a system. Decisions are linked and have both benefits and consequences.

Participant 13 added,

> Understanding what this really means in practice might differ from person to person. As I understand it, facilitating a learning ecosystem means the teacher is not the 'sage on the stage' but rather a facilitator where students are doing much of the acquisition and transmission themselves - this is a positive good.

Participants 3, 4, 5, 7, 9, 11, 12, 14, 15, and 16 rated this component as strongly endorsed, and their comments can be summed up in the following comment by Participant 11, “Learning ecosystems help to foster creativity and innovation, which in turn affect the instruction delivered to students. Adult education programs that build learning ecosystems where digital literacy skills are a priority show better performance results.” Participant 18 supported this by stating, “Having an ecosystem of learners acquiring, developing, and transmitting digital literacy skills will allow best practices to be developed and increase student performance and acquisition.” Facilitating the construction of a learning ecosystem will help adult learners and teacher acquire the necessary skills.

The three merged categories’ component is worded as follows: “Systematically plan digital literacy activities that align with digital technologies that enhance academic learning outcomes, content creation, problem-solving, and critical thinking” according to Participant 3, this component had a comprehensive wording that “covers many facets of

what digital literacies learning entails." Participant 18 commented on the wording by stating, "This is worded very well! Digital literacy activities should be educational to help with critical thinking and problem-solving skills." Participant 11 also commented on the process by stating, "The process of this [component] would be the nucleus of the DL [digital literacy] implementation and center of its outcome and progression." Participant 12 expanded the comment on progression by stating, "In order to promote digital literacy skills in the classroom, educators must be able to overcome barriers that may hinder progress of utilizing technology in the classroom effectively. This requires a systematic plan of digital literacy activities." Participant 19 presented a realistic view of this component for adult education programs by stating, "This ideal statement may not meet the reality of most programs' abilities to actually deliver on this goal." Even though Participant 9 stated that "this works as long as they truly complement each other. I think this is harder than it looks," but "well planned digital literacy activities should provide those much-needed outcomes," added Participant 17." "Systematically planning digital literacy activities that align with digital technologies sharpen critical thinking skills, which are the basis for developing students' analytic reasoning and increasing their efficiency and productivity," said Participant 12. "This helps keep the digital literacy initiative in line with [a] larger program, and academic goals [and] helps students see [the] relevance," concluded Participant 13. This component received 100% consensus in Rounds 2 and 3

Based on the instructional coaches' category, I wrote the component as follows: "Empower and develop instructional coaches (change agents or change facilitators), who

will guide the implementation of digital literacy initiative at the teacher and student level." "Coaches can effectively guide and train practitioners as implementation progresses," said Participant 19. They "help adult education programs develop expertise in digital literacy and academic content standards," stated Participant 12. "There is evidence to support peer-to-peer educational supports to be the most beneficial," noted Participant 18. Some participants asked if teachers would be the instructional coach, and Participant 20 responded by stating,

> We have seen programs reimagine "specialization" of their staff to allow for those teachers who excel with technology or digital skills to focus on these areas and support other instructors. This includes "push-in" instructors who rotate classrooms to provide explicit digital skills lessons, and tool experts or champions to support other teachers through PD.

Participant 14 introduced the concept of digital navigators by saying, "It is great to have digital navigators to test learners' skills, perhaps provide instruction, point the learner to low-cost devices and internet, and provide basic tech support, as well as ensuring teachers are implementing digital literacy instruction." Participant 4, who rated this component as strongly endorsed stated, "This was extremely important in our program. I think without our DL lead really pushing for changes, we would not be where we are today."

The last component under the systems and support theme was based on the mindset, metacognitive, and meta-learning strategies and activities category. This category was coded from the data collected in Round 1 interviews. "Metacognitive and

meta-learning strategies empower students to think about their thinking. This awareness of the learning process enhances their control over their learning and improves their capacity for self-regulation and managing their motivation for learning," said Participant 10. Simply put, "learning is much more effective when students consider their thinking," stated Participant 19. "Metacognition is the ability to use prior knowledge to plan a strategy for approaching a learning task, take necessary steps to problem solve, reflect on and evaluate results, and modify an approach as needed. Therefore promoting, facilitating, and engaging in metacognitive strategies and activities within the digital literacy initiative, helps learners choose the right cognitive tool for tasks and plays a critical role in successful learning," said Participant 12. Participant 20 continued by stating,

> This [component] is aspirational but challenging to implement. This ties into well-crafted instructional materials that provide guidance for teachers on how to model "out loud" thinking as they are trained to do in math and reading instruction. This comes with effective PD and an emphasis on the notion that "tech integration" or "digital skills integration" is not just about using technology; it's about taking the opportunity to explicitly mention [that] the digital skills learners are developing as they utilize technology (and making connections across tech-enabled tasks and the different technologies being used).

Participant 15 went a step further and stated the importance of the component in relation to other components,

> I feel this is more important than the component around digital literacy curriculum. Well-trained teachers can facilitate learners in making the digital skills connections needed to internalize the skills. For example, asking students to look up something and then asking them targeted questions (What browser did you use? What search terms did you use? How do you know what you found is a valid source?) to model the thinking behind effective use of technology.

Promoting, facilitating, and engaging in metacognitive and meta learning strategies and activities should not be limited to a digital literacy initiative; it is important in any type of educational program or setting.

Table 4

Core Components with Consensus and their Themes

Core Components	Consensus	Theme
1. Ensure that learners, teachers, and other participants in the digital literacy initiative have access to a device, digital technologies, internet connection, and technical support.	100%	Access
2. Conduct a comprehensive needs assessment of learners, teachers, and the adult education program	100%	Assessment
3. Establish an assessment and evaluation protocol for the digital literacy initiative.	100%	
4. Provide ample opportunities for students to apply digital literacy skills in support of content learning.	100%	Active Engagement
5. Promote, provide, and commit to continuous learning activities that are reflective of the wide range of digital literacy competencies and tools for digital literacy acquisition	100%	
6. Promote and facilitate the formation and sustainability of professional learning communities.	95%	Training
7. Provide ongoing intentionally targeted professional development training of digital literacies for a digital literacy initiative.	95%	
8. Research, identify, and align or design a digital literacy curriculum with the goals, mission, and vision of the adult education program.	90%	Curriculum
9. Embed the digital literacy curriculum into the general adult education curriculum in a relevant and seamless manner.	100%	
10. Integrate and embed digital technologies in planning and designing learning environments and experiences for learners.	95%	
11. Facilitate the construction of a learning ecosystem where digital literacy skills acquisition, development, and transmission will thrive.	90%	Systems and Support
12. Systematically plan digital literacy activities that align with digital technologies that enhance academic learning outcomes, content creation, problem-solving, and critical thinking.	100%	
13. Promote, facilitate, and engage in metacognitive and meta-learning strategies and activities within the digital literacy initiative.	95%	
14. Empower and develop instructional coaches (change agents or change facilitators) who will guide the implementation of digital literacy initiative at the teacher and student level.	90%	
15. Encourage confidence, promote competence, and support courage of all participants within a digital literacy initiative.	95%	

Summary

In Chapter 4, I explained the data collection and data analysis process and presented the findings. The participants agreed on 15 core components of digital literacy initiatives in adult education programs (see Appendix E). These experts reached a consensus on 15 core components after three rounds. Along with the 15 core components, the experts explained the Delphi-derived core components and justified the rating they gave to each component (Appendix F). The findings were presented in this chapter under the following thematic headings: access, curriculum, active engagement, training, assessment, and systems and support (see Table 4). A digital literacy initiative needs to provide access to a device, internet connection and technical support. All digital literacy initiatives need a curriculum that encourages active engagement, and establishes an assessment and evaluation protocol. The systems and support theme encompasses embedded digital technologies, enhanced academic learning outcomes, content creation, problem-solving, and critical thinking that needs to be an integral part of a digital literacy initiative. In Chapter 5, I present an interpretation of the findings.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative modified Delphi study was to identify what experts agreed were the core components of digital literacy initiatives that would provide clarity and consensus for adult education programs. I sought to identify core components of digital literacy initiatives that contribute to the development of frameworks, models, guidelines, and strategies for adult education programs. In this study, I used a qualitative approach with a modified Delphi method of inquiry to collect data (Skulmoski et al., 2007). The Delphi method was modified to "suit the circumstances and research question" (Skulmoski et al., 2007, p. 5) and made it a suitable method to identify the core components of digital literacy initiatives. In addition, the IC dimension of the CBAM framework supported the need for a team (Hord et al., 2014) or a panel of experts because identifying components is "an interactive and iterative process" (Hord et al., 2013, p. 13) and consensus-building are encouraged to provide information on the components of digital literacy.

This study included 20 participants who participated in three rounds of questioning, with the first round including an interview where I asked open-ended questions based on the research questions. The second and third rounds included Delphi instruments based on the coded responses from the first round and second round, respectively. After the first round, 28 categories were identified from the coded responses. I used the 28 categories to create 25 components for the second-round Delphi instrument. After analyzing the data from the second round, I created 15 components for the third-round Delphi instrument. The following themes emerged from the categories:

access, active engagement, training, curriculum, assessment, and systems and support. Data analysis yielded findings from the participants about access to a device, an internet connection, and technical support. The experts agreed that a digital literacy curriculum needs to be embedded, instructors need to be trained, learners need to be actively engaged, and an assessment protocol is vital. Experts also agreed that adult education programs need to establish systems and support to enable the full development of a digital literacy initiative.

Interpretation of the Findings

In response to research Question 1, experts agreed on 15 core components of digital literacy initiatives for adult education programs. The 15 core components that fall under the following six themes: access, active engagement, training, curriculum, assessment, and systems and support emerged after the analysis of Round 1 data and was enhanced in Round 3 the final round. Core components are the operational features of an innovation. These operational features are the people element. The 15 core components agreed upon by the experts reflect the people element, and the core components address how developers in adult education programs should implement a digital literacy initiative. In response to research Question 2, the experts explained and justified the Delphi-derived core components. They offered rich data that supported why they gave each component a specific rating. These explanations and justifications gave insight into the diverse yet many times similar opinions of 20 experts. These 20 experts agreed upon 15 core components of a digital literacy initiative for adult education programs (see Table 4).

Under the access theme, adult education programs, who are involved in the development of a digital literacy initiative need to ensure that learners, teachers, and other participants in the digital literacy initiative have access to a device, digital technologies, internet connection, and technical support. The component dealing with access covered three of the 28 categories identified in Round 1. How each program provides access will be determined by each individual program. This finding confirmed Hord et al.'s (2014) concept of core components in CBAM's IC dimension. The core components are the major operational features (Hord et al., 2014) of an innovation – digital literacy initiative. The core components are broad and can have a number of possible variations that represent the different ways in which a digital literacy initiative can be put to use (Hord et al., 2014). Each adult education program will determine how their learners, teachers, and other participants in the digital literacy initiative will have access. Addressing the lack of access in a digital literacy initiative is one way of addressing an aspect of the digital divide. Studies have confirmed that the new digital divide describes a wider gap than just a lack of access to digital or information and communication technologies. The new divide now includes a lack of knowledge, and a lack of skills transmission (Chetty et al., 2018; van Deursen & van Dijk, 2019). This core component addresses one of the three elements of the digital divide, and adult education programs will need to address the issue of access when developing a digital literacy initiative.

The theme of assessment covers two components and four of the 28 categories identified in Round 1. Adult education programs need to conduct needs assessments of

learners, teachers, and the adult education program. Programs also need to establish an assessment and evaluation protocol for the digital literacy initiative. Assessments and evaluations are inherent in the education arena and is a necessity to evaluate learners on their completion of the established objective and can help to determine the gaps in a digital literacy initiative for an adult education program (Schmidt & DeSchryver, 2022). The only way to know if the digital literacy initiative is doing what it was established to do is through assessments and evaluations of all aspects of the initiative. Without this component, assessment, there is "little chance of knowing that all of the 'its' are the same in practice" (Hord et al., 2014, p.10). The components under the assessment theme provide developers with clarity for future implementation practices of a digital literacy initiative. The two components in the assessment theme emerged from data in Round 1, where the experts talked about assessment of the learners first, then the teachers to determine teacher professional development. Assessment or inventory of the adult education program was only mentioned by about 40% of the experts. Assessment is a pivotal part of the conceptual framework – CBAM. As a conceptual framework, CBAM provides tools and techniques for "facilitating and assessing the implementation of new innovations or reform initiatives" (Hall & Hord, 2015, p. 73). Establishing assessment and evaluation protocols and performing needs assessments are agreed upon core components of digital literacy initiatives for adult education programs.

Training as a theme covers two components and four of the 28 categories from Round 1. The theme of training is geared towards teachers, instructors, and other participants involved in delivering instruction in the digital literacy initiative. A digital

literacy initiative cannot prepare citizens if the teachers or instructors are not prepared. This finding extends the knowledge on training in the literature. Educators, implementers and policymakers are increasingly looking at targeted and intentional training and professional development (Feerrar, 2019; Darling-Hammond et al., 2020). Professional development or training for teachers is a crucial strategy for supporting the wide range of skills adult learners need to be prepared for the knowledge society (Feerrar, 2019; Darling-Hammond et al.,2020). Teachers, instructors, and other professionals need to be trained. Programs should provide ongoing targeted professional development of digital literacies and facilitate the formation and sustainability of professional learning communities. The formation of a professional learning community can allow teachers to move from "simply learning online tools to engaging in meaningful discussions" about supporting skills acquisition, enhancing instructional strategies, improving student learning, and cultivating an ecosystem (Tucker & Quintero-Ares, 2021, p. 12). Based on the CBAM's IC dimension, each adult education program can determine what their professional learning community would look like in practice with added variations to the core component (Hall & Hord, 2015). Whether big or small, professional learning communities can complement formal and informal training opportunities and provide institutions with an excellent avenue for teacher collaboration and collegiate discourse (Tucker & Quintero-Ares, 2021).

The theme of curriculum comprises of two components and two of the 28 coded categories from Round 1. According to the experts, the adult education program should embed the digital literacy curriculum into the general adult education curriculum in a

relevant and seamless manner. Additionally, programs need to research, identify, and align or design a digital literacy curriculum with the goals, mission, and vision of the adult education program. The components advance the idea that the digital literacy curriculum should be embedded and aligned. The general consensus on the components of the curriculum theme is that the developers of the digital literacy initiative should begin with a curriculum that was already designed and add or combine elements from other curricula to create one that is suited for their population. This extends the knowledge in the literature about a digital literacy curriculum. When the digital skills are embedded in the curriculum, the implementers can enable students to communicate in a digital environment, establish a safe digital presence, and promote digital literacy skills that are responsive to the individual needs of the adult learner (Johnston, 2020).

Active engagement as a theme promotes the idea that the learner must be an active constituent in a digital literacy initiative. The active engagement theme covers two components that were created from two of 28 coded categories from Round 1. In developing a digital literacy initiative, adult education programs need to promote, provide, and commit to continuous learning activities that are reflective of the wide range of digital literacy competencies and tools for digital literacy acquisition. Programs also need to provide ample opportunities for students to apply digital literacy skills in support of content learning. As confirmed in the findings from the data, a digital problem solver's connection, interaction and engagement with and in the digital world needs to be an integral part of everyday life (Jacobs & Castek, 2018). Although programs may not be able to guarantee lifelong engagement, they can provide ample opportunities for learners

to apply the skills and actively engage in the digital literacy initiative through learning activities. Learning activities promote a powerful association with "the acquisition of domain-specific knowledge than passive learning activities" so, giving learners an opportunity to practice newly acquired skills will help them build confidence, enhance their digital skills repertoire, produce digital content, and engage in complex problem-solving activities (Wekerle et al., 2020, p.3). Providing ample opportunities for students to practice and committing to continuous learning activities are essential parts of a skills acquisition process for a digital literacy initiative. These two components from the data confirm the knowledge in the research literature about the second-level divide. The second-level divide refers to skills and uses of digital technologies (van Deursen & van Dijk, 2019). By providing ample opportunities for students to practice and committing to continuous learning activities, the adult education program is helping to address the digital divide at the second level.

The systems and support theme comprises of six core components that were created from eight of 28 coded categories (see Table 3). The core components under the systems and support theme are made up of many related themes and impact all aspects of the digital literacy initiative. These six core components interconnected with other themes and were placed under the systems and support theme because they could not be situated under one of the other five themes because of the overlap. This theme is broad enough and captures the interconnected components that influence the learners, teachers, stakeholders, and other implementers of the digital literacy initiative.

Developers of a digital literacy initiative should systematically plan digital literacy activities that align with digital technologies. These digital literacy activities should enhance academic learning outcomes, content creation, problem-solving, and critical thinking, which will help the adult learner acquire, apply and become comfortable with a wide range of critical thinking, information, communication, and management skills (Johnston, 2020). In addition, adult educators should be encouraged to provide explicit instructions on digital literacies through problem-solving processes (Vanek, 2017). Furthermore, digital technologies should be integrated and embedded into the planning and designing of learning environments and experiences for learners. They should not be stand-alone learning objects. These two components are interwoven with other themes- curriculum, training, and active engagement.

The findings extend the knowledge on the new digital divide in the peer-reviewed literature analyzed in Chapter 2. Skills transmission is addressed if adult education programs facilitate the construction of a learning ecosystem where digital literacy skills acquisition, development, and transmission will thrive. Under the active engagement theme, the components covered providing the learners ample opportunities for students to apply digital literacy skills and committing to continuous learning activities, but they would be amplified and strengthened within a learning ecosystem. A learning ecosystem is a system of people, content, technology, culture, and strategy (Pornpongtechavanich & Wannapiroon, 2021). Learning interactions, applications, and transmissions take place, and the learners and teachers can thrive if they engage in metacognitive and meta-learning activities. Likewise, programs are asked to promote, facilitate, and engage in

metacognitive and meta-learning strategies and activities within the digital literacy initiative. Based on the conceptual framework- CBAMs IC dimension, programs are asked to facilitate the construction of the learning ecosystem and promote metacognitive and meta-learning strategies and activities. Individual adult education programs will have to determine the different variations of facilitating and promoting that will take place at their site. Based on program resources, they will determine how these variations will be operationalized (Hall & Hord, 2015).

Through the lens of the conceptual framework - CBAM, the use of instructional coaches, change agents, or change facilitators – as termed in the conceptual framework- is essential in the development and later implementation of a digital literacy initiative. The category – instructional coaches, was coded from the interview data in Round 1, and the findings from the data confirmed the need for instructional coaches, change agents, or change facilitators. CBAM encourages the use of change facilitators, and under the IC dimension, programs that use instructional coaches will determine the variations of the component and how they will be operationalized in each adult education program. Instructional coaches could be teachers, facilitators, volunteers, and or a combination of these individuals working together in line with a common set of goals (Hall & Hord, 2015). In this core component, the adult education program is asked to empower and develop instructional coaches (change agents or change facilitators) who will guide the implementation of the digital literacy initiative at the teacher and student level. These instructional coaches will be empowered to guide teachers as well as students. Additionally, the instructional coaches will need training; thus, the use of the word

develop in the wording of the core component. The instructional coach's component though placed under the systems and support theme, overlaps with the training, curriculum, and active engagement themes. The instructional coaches will need training; they need to be actively engaged in the digital literacy initiative with teachers as well as students, and they will need to be fully familiar with the desired curriculum of the digital literacy initiative.

Core components are the operational features of a digital literacy initiative. The core components are the people element, not implementation requirements (Hord et al., 2013). With the people element as the focus, adult education programs are asked to encourage confidence, promote competence, and support courage of all participants within the digital literacy initiative. Again, individual programs will determine the variation and how this core component is operationalized. In Round 1, the 3Cs were explained as follows, encourage confidence - encourage students and teachers to feel confident in their skills in using different kinds of technology. Promote competence – teachers and students need to have certain skills which can enable them to take on new challenges in the digital environment. Support courage – displaying so much confidence that teachers and students are willing to fail to learn in the digital technology environment. The 3Cs are operational features that reflect the people element of an innovation (Hall & Hord, 2015). The 3Cs component is under the systems and support theme but is interwoven in the training, curriculum, and active engagement themes. Teachers have to be trained to display confidence, competence, and courage. The curriculum envelops all the skills and concepts that teachers and students will acquire.

Finally, all participants in the digital literacy initiative must actively engage in the learning acquisition process within this digital environment.

Limitations of the Study

Personal bias was one of the limitations presented and could be based on my professional role in an adult education program. My interest in this topic and my desire to establish a digital literacy initiative motivated me to pursue this topic. In order to lessen this bias, the interview questions and protocol approved by my committee and the IRB were followed as closely as possible. If the interviewees had to be probed, an effort was made to adhere to the probes as written in the protocol. If there was a deviation off-topic because of responses given by participants, learned and practiced interview and language skills were used to direct the conversation back to the central topic. During transcription, a concerted effort was made to write only what the participant said. If the responses were not clear, it was noted in the transcript, and the participants were asked to make corrections when they checked the transcript for accuracy.

A second limitation was attrition based on multiple rounds. Even though the multiple rounds of this study could have contributed to attrition, it did not prove to be the case in this study. I began Round 1 with 21 participants and ended with 20 participants in Round 3. The multiple rounds and number of participants contributed to an extension of the data collection time. The data collection time lasted nearly 20 weeks.

A third limitation was associated with core components for the adult education programs. This limitation also defines the scope of the study and could have included continuing education, libraries, technical and community colleges, and other non-

traditional adult learning educational programs. Even though some participants introduced the digital literacy skills programs in public libraries, I had to stick to the scope of this study and noted that future studies could be conducted to include other types of adult learner programs.

Recommendations

Recommendations for further research are based on the conceptual framework, limitations, and findings of the study. The first recommendation stems from the limitations of the study. This study is focused on a specific adult learner population who want to learn English or earn a post-secondary credential to transition to college or a better job (Ross-Gordon et al., 2017). I recommend that further research be conducted for adult learner populations in continuing education programs, public libraries, community colleges, and other nontraditional adult learning educational programs. The adult learner population may have similarities, but their goals may differ from setting to setting. For example, the adult learner population in continuing education programs may not need postsecondary credentials or English language instruction. The core components of a digital literacy initiative for this kind of adult learner program may differ in the areas of curriculum, training, and systems and support. Further research will need to be conducted to identify the core components of a digital literacy initiative for these different programs.

The second recommendation for further research stems from the conceptual framework – CBAM's IC dimension. CBAM's IC dimension describes an innovation, program, or initiative in action and supports the formulation of an IC Map (Hord et al., 2014). Core components are used to create IC Maps which include components (core and

related) and variations of the initiative. In this study, I identified core components of a digital literacy initiative, and adult education programs can use the core components to develop IC Maps. The identification of core components is just the initial step for digital literacy initiatives. Once the core components are identified, each adult education program will need to work as a team (Hord et al., 2014) to add variations to each component that is suitable for their local program. Adult education programs will need to create their own IC Map, which can then be used as a guide for program implementation of the digital literacy initiative. Further studies can be conducted to identify IC Maps for adult education programs. Additionally, further studies can be conducted about the implementation phase of the digital literacy initiative. Future researchers could use the other dimensions of CBAM (SoC and LoU dimensions) to investigate this implementation phase.

Implications

This study may contribute to positive social change in several ways. The data for this study were collected during the COVID-19 Pandemic and about 1 year after adult education programs had experienced a new way of delivering instruction to their adult learner population. The varied versions of distance learning and online class offerings increased, and the shift in the digital landscape in adult education programs was highly evident. The need for digital literacy was more apparent than at any other time. At the organizational level, this study can contribute to positive social change by providing clarity and consensus for adult education programs. Identifying these core components of digital literacy initiatives specifically for adult education programs will help programs

fulfill state and federal mandates. Teachers, administrators, stakeholders, and policymakers will meet the demands of an evolving digital culture by providing adult learners with a wide range of competencies and applicable skills needed. Adult education programs can use the core components to establish and sustain frameworks, models, guidelines, and strategies that are program-specific and responsive to the adult learners' needs. Programs will be able to help adult learners master emerging digital avenues and apply learned skills and concepts to diverse contexts in the ever-changing digital world.

At the societal level, this study may contribute to positive social change by addressing the digital divide. Adult education programs will prepare students for new technological environments while addressing the digital divide through digital literacy initiatives. The core components of a digital literacy initiative identified in this study can address the gap in the digital divide. All 15 components address the lack of access, lack of knowledge, and a lack of skills transmission; adult learners will have access to relevant, up-to-date technology, technical support, digital literacy skills training, and essential connections.

Another contribution and implication of the study are that the findings will ultimately provide local adult education programs with more clarity and what constitutes a digital literacy initiative. Local adult education programs can use the 15 core components identified in this study to develop frameworks, models, guidelines, or strategies to effectively advance and deliver a set of competencies to adult learners. Adult learners will be able to acquire digital literacy skills, which will enable them to become digital citizens, digitally fluent, and digitally immersed in their society (Adams Becker,

Cummins, et al., 2017). Local adult education programs will be able to develop these core components in alignment with their program needs and will be able to offer professional development for their instructors, who will be central to the implementation of a digital literacy initiative.

Conclusion

Adult education programs through a digital literacy initiative facilitate the acquisition of essential digital literacy skills and empower adult learners to interact with peers in their society (Adams Becker, Cummins, et al., 2017). Providing clarity and consensus on the core components of digital literacy initiatives in adult education programs will help adult learners acquire and develop the cognitive and technical skills needed to find, evaluate, create, and communicate information when using information and communication technologies. Advancing digital literacy has powerful implications for global economies, governments (Adams Becker, Pasquini, et al., 2017), and organizations, as well as bridging the digital divide of an underserved population (U.S. Department of Education, Office of Educational Technology, 2017) that do not have sufficient access or the necessary skills to participate in a knowledge society. Leveraging a digital literacy initiative to help adult learners acquire digital literacy skills will contribute to a bridging of the digital divide of the adult education population (Sharp, 2017). Adult education programs through digital literacy initiatives will be responsive to the individual needs of the adult learner, prepare them for a competitive workforce, provide relevant and exceptional educational programs, and promote a desire for lifelong learning.

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Appendix A: Delphi Round 1 Interview

Identifying Core Components of Digital Literacy Initiatives for Adult Education Programs

This first round will be an interview and should take approximately 45 minutes to 1 hour. The other two rounds of questionnaires should take approximately 30 minutes or less to complete, and the overall rounds should be conducted over a 6-week period.

1. How long have you been working in the area of digital literacy?
    a. How did you become involved in the area of digital literacy?

(Warm-up questions meant to engage and understand the context, not to determine demographic characteristics)

2. In this study, I am using "core components" to mean the major operational features of an innovation like digital literacy initiatives. They refer to behavior or the people element of an innovation – beliefs, values, norms, attitudes, and relational aspects.

    How familiar are you with this term "core components"?

    Possible Probe:

    a. If you are not familiar with the use of this term, what term do you use to describe the operational features of a digital literacy initiative?

    Probe:

    a. What does the term "core components of digital literacy" mean to you?
    b. How does it influence the development of a digital literacy initiative in your practice?

(Note: If participants use an alternate term to "core components" use that term in subsequent questions to participants).

3. What core components of digital literacy, if any, have you been using?

Probes:

a. If core components are used - why were those components chosen?

b. If core components are not used - what was used in the development of digital literacy initiatives?

4. Bring to mind the steps and processes you used to develop digital literacy initiatives? As you reflect on the steps and processes, what core components emerge?

    a. Tell me about the core components.

5. The American Library Association (2015) defines digital literacy as "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills" (p.2). How does this definition align with your perspective of digital literacy?

Probes:

a. If this definition does not align with your perspective, please share your definition of digital literacy.

b. How much emphasis is placed on this definition in your development of digital literacy initiatives, if at all?

c. How did the definition (or your definition) of digital literacy influence the development of core components, if at all?

(Rationale: According to the literature, an accepted definition of digital literacy is foundational to the development of a digital literacy initiative because it supports, on some level the understanding of what constitutes digital literacy.)

6. What frameworks, models, guidelines, or best practices, if any, have you used in the development of core components of a digital literacy initiative?

   Probes:

   a. If you did not use frameworks, models, guidelines, or best practices, what did you use?
   b. What factors influenced the choice of this framework, model, guideline, or best practice?
   c. Describe the strengths of the framework, model, guideline, or best practice chosen.
   d. Describe the weaknesses of the framework, model, guideline, or best practice chosen.

(Note: If the panelist used something other than frameworks, models, guidelines, or best practices, use that term in subsequent questions.)

7. How does instructor preparation for digital literacy initiative influence the development of core components?

   Probes:

   a. On what core components, if any, did you focus?

   b. Tell me more about the core components derived from your focus on instructor preparation.

8. Describe how you have helped adult learners acquire digital literacy?
   a. What core components emerged?
   b. Tell me more about the core components derived from your focus on helping adult learners acquire digital literacy.
   c. Why were those core components chosen?
9. What other core components for digital literacy can you share with me?

Appendix B: Round 2 Questionnaire

Round 2 Questionnaire: Core Components of a Digital Literacy Initiative

Rate each component as either ***Ideal, Acceptable, Less Ideal, or Unacceptable***. Explain or justify each rating by adding your explanation or justification below each component. If you need to make corrections or modifications to any component, please enter it in the section provided below each component.

Adult education programs should:

1. Ensure that all learners, teachers, and other participants in the digital literacy initiative have access to a device or other digital technologies.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

2. Ensure that all learners, teachers, and other participants in the digital literacy initiative have access to Internet connection.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

3. Provide all participants in the digital literacy initiative access to technical support.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

4. Conduct a comprehensive needs assessment of teachers' digital literacy skills.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

5. Provide the digital literacy initiative with knowledgeable teachers.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

6. Promote and facilitate the formation and sustainability of professional learning communities.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

7. Research, identify, and align a digital literacy curriculum with the goals, mission, and vision of the adult education program.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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8. Embed the digital literacy curriculum into the general adult education curriculum in a relevant and seamless manner.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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9. Provide ongoing intentionally targeted professional development training of digital literacies for a digital literacy initiative.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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10. Facilitate the construction of a learning ecosystem where digital literacy skills acquisition, development, and transmission will thrive.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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11. Conduct a comprehensive needs assessment of the adult education program, site, or location.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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12. Establish and maintain a system to provide content support to the participants of the digital literacy initiative.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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13. Conduct a comprehensive needs assessment of learners' digital literacy skills.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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14. Systematically plan digital literacy activities that align with digital technologies that enhance academic learning outcomes, content creation, problem-solving, and critical thinking.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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15. Provide teachers continuous opportunities to engage with colleagues to meet the needs of all students in the digital literacy initiative.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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16. Provide ample opportunities for students to apply digital literacy skills in support of content learning.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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17. Integrate and embed digital technologies in planning and designing learning environments and experiences for learners.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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18. Promote, facilitate, and engage in metacognitive and meta-learning strategies and activities within the digital literacy initiative.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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19. Promote, provide, and commit to continuous learning activities that are reflective of the wide range of digital literacy competencies, tools, and problem-solving skills for digital literacy acquisition.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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20. Empower and develop instructional coaches (change agents or change facilitators) who will guide the implementation of the digital literacy initiative at the teacher and student level.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

21. Develop and promote opportunities for valuable collaborations.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

22. Establish an assessment and evaluation protocol for the digital literacy initiative.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

23. Create applicable and effective structures and support systems for the digital literacy initiative.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

24. Implement effective routines and processes for a digital literacy initiative.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

25. Encourage confidence, promote competence, and support courage of all participants within the digital literacy initiative.

☐ Ideal ☐ Acceptable ☐ Less Ideal ☐ Unacceptable

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

Appendix C: Round 2 Components with Consensus

Round 2 Components	Consensus %
Component 1: Ensure that all learners, teachers, and other participants in the digital literacy initiative have access to a device or other digital technologies.	100%
Component 2: Ensure that all learners, teachers, and other participants in the digital literacy initiative have access to Internet connection.	100%
Component 3: Provide all participants in the digital literacy initiative access to technical support.	100%
Component 4: Conduct a comprehensive needs assessment of teachers' digital literacy skills.	100%
Component 6: Promote and facilitate the formation and sustainability of professional learning communities.	100%
Component 7: Research, identify, and align a digital literacy curriculum with the goals, mission, and vision of the adult education program.	100%
Component 8: Embed the digital literacy curriculum into the general adult education curriculum in a relevant and seamless manner.	100%
Component 9: Provide ongoing intentionally targeted professional development training of digital literacies for a digital literacy initiative.	100%
Component 10: Facilitate the construction of a learning ecosystem where digital literacy skills acquisition, development, and transmission will thrive.	100%
Component 13: Conduct a comprehensive needs assessment of learners' digital literacy skills.	100%
Component 14: Systematically plan digital literacy activities that align with digital technologies that enhance academic learning outcomes, content creation, problem-solving, and critical thinking.	100%
Component 15: Provide teachers continuous opportunities to engage with colleagues to meet the needs of all students in the digital literacy initiative.	100%
Component 16: Provide ample opportunities for students to apply digital literacy skills in support of content learning.	100%
Component 17: Integrate and embed digital technologies in planning and designing learning environments and experiences for learners.	100%
Component 18: Promote, facilitate, and engage in metacognitive and meta-learning strategies and activities within the digital literacy initiative.	100%
Component 22: Establish an assessment and evaluation protocol for the digital literacy initiative.	100%
Component 25: Encourage confidence, promote competence, and support courage of all participants within the digital literacy initiative.	100%
Component 21: Develop and promote opportunities for valuable collaborations.	100%
Component 11: Conduct a comprehensive needs assessment of the adult education program, site, or location.	95%

Component 19: Promote, provide, and commit to continuous learning activities that are reflective of the wide range of digital literacy competencies, tools, and problem-solving skills for digital literacy acquisition.	95%
Component 20: Empower and develop instructional coaches (change agents or change facilitators) who will guide the implementation of the digital literacy initiative at the teacher and student level.	95%
Component 24: Implement effective routines and processes for a digital literacy initiative.	95%
Component 12: Establish and maintain a system to provide content support to the participants of the digital literacy initiative.	90%
Component 23: Create applicable and effective structures and support systems for the digital literacy initiative.	90%
Component 5: Provide the digital literacy initiative with knowledgeable teachers.	85%

Appendix D: Round 3 Questionnaire

Round 3 Questionnaire
Core Components of a Digital Literacy Initiative

Rate each component as either ***Strongly Endorsed, Moderately Endorsed, or Minimally Endorsed***. Explain or justify each rating by adding it below each component. If you need to make corrections or modifications to any component, please enter it below each component.

Adult education programs should:

---

1. Ensure that learners, teachers, and other participants in the digital literacy initiative have access to a device, digital technologies, internet connection, and technical support

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

---

2. Conduct a comprehensive needs assessment of learners, teachers, and the adult education program.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

---

3. Provide ample opportunities for students to apply digital literacy skills in support of content learning.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

---

4. Promote, provide, and commit to continuous learning activities that are reflective of the wide range of digital literacy competencies and tools for digital literacy acquisition.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

---

5. Promote and facilitate the formation and sustainability of professional learning communities.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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6. Provide ongoing intentionally targeted professional development training of digital literacies for a digital literacy initiative.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

---

7. Research, identify, and align or design a digital literacy curriculum with the goals, mission, and vision of the adult education program

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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8. Embed the digital literacy curriculum into the general adult education curriculum in a relevant and seamless manner.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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9. Integrate and embed digital technologies in planning and designing learning environments and experiences for learners.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

---

10. Facilitate the construction of a learning ecosystem where digital literacy skills acquisition, development, and transmission will thrive.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

---

11. Systematically plan digital literacy activities that align with digital technologies that enhance academic learning outcomes, content creation, problem-solving, and critical thinking.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

---

12. Promote, facilitate, and engage in metacognitive and meta-learning strategies and activities within the digital literacy initiative.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

---

13. Empower and develop instructional coaches (change agents or change facilitators), who will guide the implementation of digital literacy initiative at the teacher and student level.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

---

14. Establish an assessment and evaluation protocol for the digital literacy initiative.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

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15. Encourage confidence, promote competence, and support courage of all participants within a digital literacy initiative.

☐ Strongly Endorsed ☐ Moderately Endorsed ☐ Minimally Endorsed

Explain or justify your rating: Click or tap here to enter text.
Correction or modification? Click or tap here to enter text.

Appendix E: Core Components

Core Components

1. Ensure that learners, teachers, and other participants in the digital literacy initiative have access to a device, digital technologies, internet connection, and technical support.

2. Conduct a comprehensive needs assessment of learners, teachers, and the adult education program

3. Establish an assessment and evaluation protocol for the digital literacy initiative.

4. Provide ample opportunities for students to apply digital literacy skills in support of content learning.

5. Promote, provide, and commit to continuous learning activities that are reflective of the wide range of digital literacy competencies and tools for digital literacy acquisition

6. Promote and facilitate the formation and sustainability of professional learning communities.

7. Provide ongoing intentionally targeted professional development training of digital literacies for a digital literacy initiative.

8. Research, identify, and align or design a digital literacy curriculum with the goals, mission, and vision of the adult education program.

9. Embed the digital literacy curriculum into the general adult education curriculum in a relevant and seamless manner.

10. Integrate and embed digital technologies in planning and designing learning environments and experiences for learners.

11. Facilitate the construction of a learning ecosystem where digital literacy skills acquisition, development, and transmission will thrive.

12. Systematically plan digital literacy activities that align with digital technologies that enhance academic learning outcomes, content creation, problem-solving, and critical thinking.

13. Promote, facilitate, and engage in metacognitive and meta-learning strategies and activities within the digital literacy initiative.

14. Empower and develop instructional coaches (change agents or change facilitators), who will guide the implementation of digital literacy initiative at the teacher and student level.

15. Encourage confidence, promote competence, and support courage of all participants within a digital literacy initiative.

Appendix F: Components with Sample Explanations and Justifications

Components with Sample Explanations and Justifications	
Component 1: Ensure that learners, teachers, and other participants in the digital literacy initiative have access to a device, digital technologies, internet connection, and technical support.	
Explanation and Justification	All of our instructors have new laptops and we also have a computer/hotspot loaner program for students. This necessary for the DLI. Access is a vital part of digital literacy -- so that learners, teachers, and other participants can engage with the literacies they are learning freely outside of class time for their own individual purposes. Access to these items provides learners, teachers, and other participants with a solid foundation to effectively engage with online resources, digital tools, and one another in the learning process.
Component 2: Conduct a comprehensive needs assessment of learners, teachers, and the adult education program	
Explanation and Justification	A comprehension needs assessment is important because it helps determine the gaps in digital literacy in the adult education program. Knowing what people understand or need additional assistance is crucial to progressing effectively towards digital literacy and successful adult education programs. Assessing needs will identify where to focus instructional time and energy, focusing on what gaps in digital literacy exist. It is important to assess instructors as well as learners, as many instructors aren't comfortable with their own digital literacy skills and/or have never taught digital literacy We don't know where we are going unless we have a map which the needs assessment provides.
Component 3: Establish an assessment and evaluation protocol for the digital literacy initiative.	
Explanation and Justification	This is a critical component. There needs to be standardization of setting metrics and tools for measuring progress/growth against these metrics. Assessment helps programs gain insight into what students understand, to plan and guide instruction, and provide helpful feedback. An assessment is key to determine what skills a student has mastered and which still need some work.

Component 4: Provide ample opportunities for students to apply digital literacy skills in support of content learning.	
Explanation and Justification	Ample opportunities allow students to stretch their skills in different ways. Employing digital literacy skills in a meaningful and relevant context helps learners acquire new skills and knowledge by developing their abilities and attitudes. It's very important for students to see and understand how the DL skills are going to help them reach other goals.
Component 5: Promote, provide, and commit to continuous learning activities that are reflective of the wide range of digital literacy competencies and tools for digital literacy acquisition.	
Explanation and Justification	Digital literacy is huge and evolving daily; and hopefully we will be able to develop new real-world activities and tools that will keep up with technology. Continuous opportunities are important to help cement the learning for participants, and a wide range of competencies and tools is important to make the initiative as relevant as possible to as many participants as possible. Continuous learning activities need to meet the differing needs of learners (and others involved in the adult literacy system). It's not clear however that the individual is doing the committing.
Component 6: Promote and facilitate the formation and sustainability of professional learning communities.	
Explanation and Justification	Learning communities enhance participation and promote better outcomes. It can enhance instructional learning strategies, help create common assessments, and also assist in processing the digital literacy standards. Professional learning communities are key and would aid programs in facilitating and balancing out workloads.
Component 7: Provide ongoing intentionally targeted professional development training of digital literacies for a digital literacy initiative.	
Explanation and Justification	Targeted and intentional and ongoing are all keys - regular PD for teachers will be necessary to keep the initiative relevant, timely, and to keep the teachers confident. Because digital learning can enhance learning experiences, save teachers time, enable teachers to better tailor learning to student needs, track student progress, provide transparency into the learning process, and so much more, ongoing targeted professional development is crucial. Ongoing professional development is vital for sustaining any digital literacy initiative and is a research-based best practice.

Component 8: Research, identify, and align or design a digital literacy curriculum with the goals, mission, and vision of the adult education program.	
Explanation and Justification	As long as the curriculum meets many different learners needs and is continually updated and responsive to learners' needs. A research-based digital literacy curriculum aligned and designed with the adult education program provides connection, clarity, and direction to the digital literacy initiative. Curriculum that provides sensible, realistic guidance for the integration of digital skills within content areas, and guidance for how to make explicit skills connections, is both more helpful and more likely to be utilized by teachers who don't feel they have time to "stop" what they are doing to focus solely on digital skills.
Component 9: Embed the digital literacy curriculum into the general adult education curriculum in a relevant and seamless manner.	
Explanation and Justification	Embedding digital literacy skills in a meaningful and relevant context helps learners acquire new skills and knowledge by developing their abilities and attitudes. This would seem to be the best way to deliver this education. Digital Literacy is real world communication and information adults need to navigate in 2021. This has been essential to all ABE setting for the past 10 years. It is essential that all programs embed digital technology in current curriculum. As we noted during Covid-19, it is so very important.
Component 10: Integrate and embed digital technologies in planning and designing learning environments and experiences for learners.	
Explanation and Justification	The effective use of digital technologies in planning and designing learning environments and experiences for learners can increase student engagement, help teachers improve their lesson plans, and facilitate personalized learning. The more technology is embedded in the learning, the more comfortable and competent students become in their skill development. This is the core of ABE instruction. Students are better able to gain improvement in skills with authentic experiences.

Component 11: Facilitate the construction of a learning ecosystem where digital literacy skills acquisition, development, and transmission will thrive.	
Explanation and Justification	Learning ecosystems help to foster creativity and innovation, which in turn affect the instruction delivered to students. Adult education programs that build learning ecosystems where digital literacy skills are a priority show better performance results. Having an ecosystem of learners acquiring, developing, and transmitting digital literacy skills will allow best practices to be developed and increase student performance and acquisition. I'm not sure that an ecosystem can be constructed, but instead -- pay attention to the idea of systems thinking -- that every piece has an effect on another piece within a system. Decisions are linked and have both benefits and consequences.
Component 12: Systematically plan digital literacy activities that align with digital technologies that enhance academic learning outcomes, content creation, problem-solving, and critical thinking.	
Explanation and Justification	Systematically plan digital literacy activities that align with digital technologies that enhance academic learning outcomes, content creation, problem-solving, and critical thinking. This is necessary to embed the activities in a larger curriculum framework - the outcomes, problems, and critical thinking should be tied to the broader standards/goals of the course. These are all essential skills and will create learners who can think on their own in work-based situations.
Component 13: Promote, facilitate, and engage in metacognitive and meta-learning strategies and activities within the digital literacy initiative.	
Explanation and Justification	Metacognitive and meta-learning strategies empower students to think about their thinking. This awareness of the learning process enhances their control over their learning and improves their capacity for self-regulation and managing their motivation for learning. Promoting, facilitating, and engaging in metacognitive strategies and activities within the digital literacy initiative, helps learners choose the right cognitive tool for tasks and plays a critical role in successful learning. Enhancing these skills will promote digital literacy.

Component 14: Empower and develop instructional coaches (change agents or change facilitators), who will guide the implementation of digital literacy initiative at the teacher and student level.	
Explanation and Justification	These actors could be coaches, teachers, facilitators, volunteers -- and a combination of these individuals working together in line with a common set of goals. Instructional coaches help adult education programs develop expertise in digital literacy and academic content standards. Strong coaching and teachers will enable students to be more confident about their skills and the skill they are learning.
Component 15: Encourage confidence, promote competence, and support courage of all participants within a digital literacy initiative.	
Explanation and Justification	This may help with overall retention, particularly of students at the lower skill levels. The digital literacy initiative boosts student engagement. When students use digital literacy skills and tools, they engage more deeply with the content, which helps them better understand information and communicate their knowledge visually and digitally. Any successful initiative begins with motivated students. These characteristics are found in all evidence-based learning strategies.