

Assessing Online Readiness for a Professional Master's Degree Program in Agricultural Education

Maria Mercedes Rossi¹
K. Dale Layfield²
Joseph L. Donaldson³
Ye Luo⁴
Paula Agudelo⁵

Abstract

Online learning is one form of distance education mediated through information and communications technology. We used a descriptive research design to develop and validate a multidimensional instrument to assess readiness and motivations for online learning. We provided a theoretical framework to better understand the concept of readiness for online learning and motivations to learn online. We assessed the need for a professional online Master's degree in Agricultural Education from Clemson University and participants' experience with online learning. Participants in this study included 531 Cooperative Extension agents, Natural Resource Conservation Agency, Farm Service Agency employees, and School-based agricultural educators from South Carolina, North Carolina, and Georgia. Of those, 96 participants completed the open-ended question. The study findings revealed that the survey instrument is a valid and reliable tool. Most participants reported a tendency for self-directed learning as they indicated having higher learning expectations performances. Individuals who perceive themselves as capable of performing a specific task or behavior have high levels of self-efficacy. Participants expressed that distance from campus—no need to relocate, and flexibility were their primary motivators to enroll in online learning. Many prefer using asynchronous technologies since they provide a more convenient environment where they can work at their own pace and better balance their work and school responsibilities. Results may also suggest that participants who are motivated to pursue an online degree place a high value on being self-directed learners since they can plan, monitor, and evaluate their own learning process.

Introduction

Distance education has a history of nearly two centuries, and it has extensively impacted how the learning and teaching processes are conceived (Moore et al., 2011). Even though many scholars use these terms interchangeably, distance learning and distance education are two different concepts. Distance learning refers to the ability to learn at a distance, while distance education refers to the activity within the ability to learn at a distance (King et al., 2001; Moore et al., 2011).

¹ Maria Mercedes Rossi is a Postdoctoral Researcher in the Food, Nutrition, and Packaging Sciences Department, Clemson University, C228 Poole Agricultural Center, Clemson, SC 29634, rossi@clemson.edu. <https://orcid.org/0000-0002-4670-2900>

² K. Dale Layfield is an Associate Professor of Agricultural Education in the Department of Agricultural Sciences, Clemson University, 246 McAdams Hall, Clemson, SC 29634, dlayfie@clemson.edu. <https://orcid.org/0000-0002-1487-6922>

³ Joseph L. Donaldson is an Associate Professor, Extension Specialist of Agricultural and Extension Education and the Director of Undergraduate Programs in the Department of Agricultural and Human Sciences at North Carolina State University, 248 Ricks Hall, 1 Lampe Drive, Raleigh, NC 27695, joseph_donaldson@ncsu.edu. <https://orcid.org/0000-0002-9276-3747>

⁴ Ye Luo is a Professor in the Department of Sociology, Anthropology and Criminal Justice at Clemson University, 130G Brackett Hall, Clemson, SC 29634, yel@clemson.edu. <https://orcid.org/0000-0003-4899-318X>

⁵ Paula Agudelo is the Associate Dean For Research & Director of the Clemson University Experiment Station for the College of Agriculture, Forestry and Life Sciences, 104 Barre Hall, Clemson University, Clemson, SC 29631, pagudel@clemson.edu. <https://orcid.org/0009-0009-1787-2749>

Online learning is one form of distance education facilitated through information and communications technology such as the Internet or other multimedia technologies (Pillay et al., 2007). These new technologies can function in synchronous or asynchronous environments. Synchronous technologies are real-time tools that support interactive learning. One of the advantages of these technologies is that they can engage students instantly. Examples of these technologies are video conferences and chats that promote communication between teachers and students and between peers (Dhawan, 2020).

On the contrary, asynchronous technologies are recorded technologies not bound by time or place Rossi et al., 2021. Students can work at their own pace and time; hence it is considered a more flexible and less-structured environment. Students can download materials anytime and communicate with peers or professors using the Internet. With this technology, students can adjust their time better, combining work and family with school responsibilities (Hrastinski, 2008; Kaymak & Horzum, 2013).

To better understand the concept of online learning, Singh and Thurman (2019) conducted a systematic review of the literature on how researchers have defined online learning during the last 30 years. The authors concluded that a definition of online learning must include: a clear explanation of the term to avoid overlapping and ambiguity, a description of how the learning process is conceived, the type of technology used, and whether teaching would occur in a synchronous or asynchronous environment. It must also include interactivity or learning examples and recognize the role of physical distance, if any exists (Singh & Thurman, 2019). Online learning recently gained more popularity due to a pandemic declared by the World Health Organization in March of 2020 caused by the SARS-CoV2 virus that causes COVID-19, an extremely contagious and deadly disease.

Demand for online learning in agricultural education has been recognized in the literature for school-based agricultural educators (SBAE) and Extension Agents (Wilson & Moore, 2004; Miller and Miller, 2008). However, only a few studies explore other potential audiences, such as employees in agricultural services and businesses. These studies have been conducted locally (Wilson & Moore, 2004). Our study aimed to explore other potential audiences for an online Master's degree in Agricultural Education. We also aimed to develop and validate a complex and multidimensional instrument to assess participants' motivation and readiness for online learning. The study focused on Cooperative Extension agents, school-based agricultural educators, and Agricultural Service Agency professionals from South Carolina, North Carolina, and Georgia.

Theoretical Framework and Literature Review

The social cognitive theory (SCT), proposed by Albert Bandura in 1996, has been widely used as a theoretical framework in the field of distance education. The SCT emphasizes the vital role of the environment on motivation, learning, and self-regulation. According to Bandura, all learning activities occur in a social environment in which unique characteristics, such as cognition, beliefs, skills, affect, behavior, and environmental influences, frequently interact (Schunk & DiBenedetto, 2020). Bandura defined outcomes expectation as an individual's belief that a particular behavior will direct to a specific outcome. A few years later, Compeau et al. (1999) uncovered that technology was affected by a person's levels of self-efficacy. People with higher levels of self-efficacy used computers more often while experiencing lower anxiety and computer-related problems (Compeau et al., 1999). In the field of distance education, Hung et al. (2010) utilized the SCT as a framework for conceptualizing the dimension of computer/internet self-efficacy and selecting survey items to measure that dimension. According to the author, computer/internet self-efficacy does not relate only to performing some basic Internet-related tasks but to applying higher-level skills such as troubleshooting problems or using the Internet to gather information about online learning (Hung et al., 2010). Liaw (2001) developed a model

based on users' perceptions of a web-based technology as a training tool with the SCT and the technology acceptance model (TAM) as a theoretical framework (Liaw, 2001).

Student readiness for online learning is a relatively new concept, with a history of more than two decades (Rossi et al., 2021). It focuses on the following characteristics: the preference for the online environment, student confidence and competence in using the Internet and the computer to communicate, and the ability to learn autonomously due to internal motivations to learn (Smith et al., 2003; Pillay et al., 2007; Hung et al., 2010; Rossi et al., 2021). Many assessments have been developed to measure the construct of readiness for online learning. The McVay-Lynch instrument tool has been acknowledged in the literature as essential to assess the construct of online readiness. It focuses on students' attitudes and behaviors considered predictors of online learning (Smith et al., 2003). Smith et al. (2003) studied McVay's Readiness for Online Learning tool to validate it. The authors concluded that the survey instrument is reliable and can be used to assess online readiness. However, further research is required to determine its predictive validity (Smith et al., 2003). Hung et al. (2010) conducted a confirmatory study on McVay's Online Learning Readiness Scale (OLRS). They showed that the scale was multidimensional and valid for online learner attitudes and behavior. However, in the limitation section, the authors explained that since computer/internet self-efficacy and learner control did not show satisfactory convergent validity, the indicators for these two dimensions must be revised or replaced (Hung et al., 2010). The model had five dimensions: self-directed learning, motivation for learning, computer/internet self-efficacy, online communication self-efficacy, and learner control (Hung et al., 2010).

Additionally, Dray et al. (2011) developed a self-assessment tool to measure readiness for online learning. Although the study showed a solid validity for the items related to the learners' characteristics, the items for the technology subscale yielded inconsistent results. After revising the concepts, the authors changed the name to Information and Communication Technology (ICT) engagement scale, which focuses on four areas: "basic technologies skills, access to technology, usage of technology, and relationship with ICT," (Dray et al., 2011, p. 43). Cabi and Kalelioglu (2019) assessed Turkish students' attitudes and readiness to enroll in an online course from different departments at a private University. The authors translated to Turkish the Readiness for Online Learning Scale developed by Hung et al. (2010) and used a revised version of the Attitude of Students Towards E-learning scale, to measure student satisfaction with e-learning experiences. The study findings revealed a significant effect on students' computer/Internet self-efficacy and successfully improved self-directed learning skills. Also, students with high motivation had high self-directed skills (Cabi & Kalelioglu, 2019). Even though many instruments that measure the construct of readiness for online learning exists, they were developed to measure how ready students currently enrolled in online programs or taking online classes are. However, a valid and reliable instrument to measure how ready professionals in agricultural service agencies (FSA and NRCS), Cooperative Extension agents and School-based agricultural educators are to pursue an online Master's program in agricultural education is needed.

There are two types of motivation, intrinsic motivation and extrinsic motivation. Intrinsic motivation leads a person to learn because of the satisfaction of doing it. Extrinsic motivation may lead a person to perform a particular behavior to avoid a punishment or receive a positive incentive (Hung et al., 2010). The effects of motivation and online learning have been studied in the literature. Internal motivation to pursue a degree and acquire technical knowledge were the most reported motivators to enroll in an online Master's degree (Miller & Miller, 2005). Other motivations have also been identified, including: (a) employment goals; (b) a raise in salary (Cullum, 2016; Pugh, 2019); (c) acquiring a postgraduate degree (Miller & Miller, 2005; Carroll, 2011; Pate & Miller, 2012); (d) personal development benefits (Cullum, 2016; Pugh, 2019). Also, (e) having a good job or career (Carroll, 2011; Pate & Miller, 2012); (f) current job requirement (Miller & Miller, 2005; Pate & Miller, 2012); (g) acquiring or improving technical knowledge and/or academic skills; (h) the enjoyment of learning new information (Miller & Miller, 2005; Pugh, 2019). Additionally, (i) convenience (Russell, 2013; Cabi & Kalelioglu, 2019); (j) flexible pacing to

complete the program (Noel-Levitz, 2006; Oguz et al., 2015; (k) distance from campus- no need to relocate (Russell, 2013; Abramenka, 2015), and (l) time constraints due to work responsibilities (Abramenka, 2015; Cullum, 2016).

Results from the 2006 National Online Learners Priorities Report revealed that convenience was the primary motivation to enroll in the online program. Work schedule, flexibility, and program requirements were also important (Noel-Levitz Inc., 2006). Furthermore, Magda and Smalec (2020) conducted a study with 19 universities that partnered with Wiley Education Services. Most students chose flexibility as the primary motivator, followed by the convenience of schedules and program length (Magda & Smalec, 2020).

Study Objectives

The objectives of this study include the following: (1) develop and validate a complex, multidimensional instrument survey instrument to assess online readiness and motivation to learn online; (2) describe participant's demographic characteristics and their previous experience with online learning; (3) assess participants' readiness to pursue an online Master's program in Agricultural Education, and (4) examine participants' motivations for pursuing an online Master's degree in Agricultural Education. One characteristic that made this study unique was the target population. Miller and Miller, and Wilson and Moore had previously assessed the needs of Cooperative Extension agents and SBAE for an online Master's degree in Agricultural Education or a combination of both audiences. However, the research team was able to understand professionals in Agricultural Service Agencies' (e.g., Cooperative Extension Agents, SBAE, Farm Service Agency employees, and Farm Service Agency employees) needs, interests, readiness, and motivations to learn online and ask for recommendations to improve the professional online Master's degree in Agricultural Education at Clemson University.

Methodology

Study Design

We conducted a non-experimental descriptive research study since it is optimal for accurately describing the facts and characteristics of a specific population in real-life situations. Survey research is a type of design used to gather information about a specific population that shares a particular feature (Radhakrishnan, 2013). We used qualitative and quantitative strategies, such as structured and open-ended questions, to explore human behaviors and preferences. We developed a complex, multidimensional instrument tool based on results from a pilot intervention that we conducted to test the feasibility of our study protocol, data collection instruments, and sample recruitment strategies. We adjusted the main study's population based on the pilot study's results.

Population

The study was conducted with a census of Cooperative Extension agents and specialists from South Carolina (SC), North Carolina (NC), and Georgia (GA), and school-based agricultural educators (SBAE) from SC, NC, and GA. Farm Service Agency (FSA) field staff and Natural Resource Conservation Service (NRCS) field staff from SC, NC, and GA were invited to participate.

Cooperative Extension Agents Contacted

One hundred and fifty-three Cooperative Extension Agents from Clemson University in SC, 562 from North Carolina State University (NCSU) in NC, and 264 from the University of Georgia (UGA) in GA were contacted electronically to participate in our study. All contacted agents from SC received the survey. In NC, eleven email addresses were undeliverable emails, one agent retired, and two were on extended leave. Therefore, 547 Cooperative Extension agents received our invitation. Finally, UGA no longer employs two agents; another was on maternity leave, reaching 261 employees in GA.

Natural Resource Conservation Service Field Agents

From SC, 70 Natural Resource Conservation Service (NRCS) field agents were contacted via email to participate in our study. From NC 181 employees, and from GA 176. Three from SC had undeliverable email addresses, and one employee refused to participate; therefore, only 66 SC NRCS field agents received our survey. From NC, four had undeliverable email addresses; therefore, only 177 NRCS employees received our survey. From GA, 30 had undeliverable email addresses, and one person passed away. Hence, 145 NRCS employees received the survey in GA.

Farm Service Agency employees

From SC, we invited 126 employees, 327 employees from NC, and 314 from GA. In each state, one email address was undeliverable, resulting in 125 employees in SC, 326 in NC, and 313 in GA who received our survey.

School-based Agricultural Educators

In SC, we contacted 125 teachers via email. Of those, twelve email addresses were undeliverable; 113 received our survey. We implemented a different approach in NC and SC since the school-based agricultural educators' contact information is unavailable to the public. In NC, the state agricultural education leader and state FFA advisor shared our study information with a listserv of 500 SBAE. In GA, the GA Vocational Agriculture Teachers Association shared our study information with a listserv of approximately 500 SBAEs. We aggregated the number of contacted people from the pilot study that was conducted with a census of Clemson University Cooperative Extension Agents and Specialists, SC School-based agricultural educators (SBAE), SC Farm Service Agency (FSA) field employees, SC Natural Resource Conservation Service (NRCS) field staff, and Agritourism Operators in South Carolina. Agritourism Operators were removed from the study due to the low response rate. Table 1 summarizes the total number of contacted people from the pilot and main study by occupation and region.

Table 1
Aggregated Population by State and Occupation

| Occupation | State | Pilot study | Main study | Total |
|---|----------------|-------------|------------|--------------|
| Cooperative Extension Agents | South Carolina | 25 | 153 | 178 |
| | North Carolina | | 547 | 547 |
| | Georgia | | 261 | 261 |
| Natural Resource Conservation Service field employees | South Carolina | 28 | 66 | 94 |
| | North Carolina | | 145 | 145 |
| | Georgia | | 177 | 177 |
| Farm Service Agency employees | South Carolina | 13 | 125 | 138 |
| | North Carolina | | 326 | 326 |
| | Georgia | | 313 | 313 |
| School-based Agricultural Educators | South Carolina | 30 | 113 | 143 |
| | North Carolina | | 500 | 500 |
| | Georgia | | 500 | 500 |
| Total | | | 3,226 | 3,322 |

A total of 531 individuals completed the survey, with a response rate of 16%. Of those, 14% were Cooperative Extension agents from SC, 36% from NC, and 20% from GA. Furthermore, 11% were SBAE

from SC, 5% from NC, and 9% from GA. Finally, 3.2% worked in an Agricultural Service agency in SC, and 0.4% from NC. From GA, none of them responded to our survey. Table 2 summarizes participants' characteristics by state and occupation.

Table 2
Participants' Characteristics by State and Occupation

| Occupation | State | Frequency | Percentage |
|---------------------------------------|----------------|-----------|------------|
| Cooperative Extension agents | South Carolina | 73 | 14% |
| | North Carolina | 188 | 36% |
| | Georgia | 105 | 20% |
| School-based Agricultural educators | South Carolina | 60 | 11% |
| | North Carolina | 26 | 5% |
| | Georgia | 46 | 9% |
| Agricultural Service Agency employees | South Carolina | 17 | 3.2% |
| | North Carolina | 2 | 0.4% |
| | Georgia | 0 | 0% |

Instrumentation

Based on the literature review and per the recommendation of our panel of experts, a modified version of the Hung et al. (2010) instrument was used since it is a valid and multidimensional tool. The construct of online readiness was measured with the following dimensions: (a) self-directed learner (12 items), (b) learner control (5 items), (c) online communication self-efficacy (5 items), and (d) computer/Internet self-efficacy (5 items), with a total of 27 items. Each item per dimension was selected if they appeared two or three more times in the literature (Rossi et al., 2021). Self-directed learning focuses on how learners take responsibility, gain knowledge, and understand how to solve problems in online learning. Learner control emphasizes how online learners take control over the sequence, pace, and review of the amount of instruction. Online communication self-efficacy refers to effectively communicating with others using computer technology. computer/internet self-efficacy focuses on online learners' ability to demonstrate proper computer and Internet skills (Hung et al., 2010). Motivating factors to online learning was a separate survey section that had two dimensions (a) intrinsic motivation (8 items) and (b) extrinsic motivation (4 items). Furthermore, we gathered demographic information with six items, measured participants' experience with online learning with four questions, and assessed participants' needs for online learning with four items.

We administered the survey using the Qualtrics XM software and measured readiness for online learning and motivating factors to online readiness with a 5-point Likert scale (1 = very true, 2 = somewhat true, 3 = neither true nor false, 4 = somewhat false, and 5 = completely false), which was condensed into a 3-point scale to improve analysis (1=True, 2=Neither True or False, 3=False). Clemson University Human Subjects Institutional Review Board approved the study. Informed consent was confirmed by participants' willingness to complete the online survey.

We followed a modified tailored design method (Dillman et al., 2014). The lead researcher sent an invitation email to all potential participants to join the study with a link to the online Qualtrics Survey, highlighting the importance of participation. During the following month, once a week, we sent follow-up email reminders with the link to complete the survey to those who had not completed the questionnaire yet. The lead researcher also sent a personalized email thanking each of them for participating in the study. To establish if those who completed the survey represented the entire population, we followed the Miller and Smith (1983) methodology by comparing respondents to non-respondents to handle non-response error. We also followed Gall et al. (1996) recommendation that a minimum of 20 non-respondents be contacted if the response rate was less than 80% (Gall et al., 1996). To reach that goal, we contacted a total of 84 non-

respondents. The response rate was: 37.5% (12 responses). We analyzed demographic characteristics such as age, gender, and occupation. Due to differences in sample size, we compared those characteristics, which showed similar profiles, indicating similarities among the population and allowing us to generalize results to the entire population.

Validity of the Instrument

We gathered different sources of evidence to evaluate the validity of this assessment tool. First, we estimated the content validity; to assess how well the instrument measured each theoretical construct by describing the steps to develop the instrument tool. Second, we calculated our new instrument tool’s correlation and compared the results with other validated instruments since no gold-standard measurement is available to make the comparison (Sullivan, 2011). Then a panel of four experts reviewed the instrument to provide face and content validity assessment. Three experts were faculty members from Clemson University and one from North Carolina State University. Finally, we pilot-tested the tool to improve the survey’s quality by recognizing content problems and the statements’ accuracy and estimating the scale’s reliability. The new instrument included 24 questions.

Reliability of the Instrument

We used *Cronbach alpha* to estimate the instrument’s internal consistency. It is used to determine if the assessment tool provides the same result every time used in the same setting and with similar subjects (Sullivan, 2011).

Data Analyses

We analyzed the data with IBM Statistical Package for the Social Sciences (SPSS) Statistics Software for Apple Macintosh version 27.0. To explore the data’s essential features, we calculated descriptive statistics including frequencies, percentages, and standard deviation for the online learning readiness and motivation scales.

Results

Objective 1: Develop and validate a complex, multidimensional instrument survey instrument to assess online readiness and motivation to learn online.

Cronbach α for the online learning readiness scale was .944, revealing an excellent internal consistency. We also estimated the total-item correlation that might help identify any items that may not belong to the questionnaire. We examined the corrected item-total correlation, indicating how each item correlates with the overall questionnaire score. A correlation smaller than $r = .30$ suggests that the item may not belong to the scale (*SPSS Tutorial: Cronbach alpha*. 2021). We finally estimated the Cronbach Alpha for each item if that item is deleted. We were looking for a substantial increase in the scale. All the correlations results were more significant than $r = .30$; therefore, none of the items were excluded (SPSS Tutorial: Cronbach α , 2021). Table 3 summarizes the results of the reliability item-total statistics for the online readiness scale.

Table 3
Reliability Item-Total Statistics of 27 Item

| Item | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach’s Alpha if Item Deleted |
|--|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| SDL1: I would be able to use feedback to evaluate my performance (i.e., self-critique) | 42.38 | 233.17 | 0.58 | 0.94 |

| Item | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| SDL2: I am good at completing tasks independently (i.e., I won't need others to encourage or remind me to complete assignments) | 42.57 | 233.82 | 0.59 | 0.94 |
| SDL3: I would be able to carry out my own study plan | 42.43 | 233.72 | 0.58 | 0.94 |
| SDL4: I do not give up easily when confronted with technology-related obstacles (e.g., Internet connection issues, difficulty with downloads, difficulty locating information, unable to contact the instructor immediately) | 42.27 | 227.34 | 0.63 | 0.94 |
| SDL5: I have high expectations for my learning performance | 42.81 | 239.16 | 0.60 | 0.94 |
| SDL6: I would be able to plan, monitor, and evaluate my own learning process | 42.38 | 229.50 | 0.69 | 0.94 |
| SDL7: I would be able to seek assistance when facing problems | 42.69 | 238.30 | 0.52 | 0.94 |
| SDL8: I would be able to set up my learning goals | 42.39 | 231.00 | 0.65 | 0.94 |
| SDL9: I would be able to set up deadlines to meet my goals | 42.54 | 232.84 | 0.61 | 0.94 |
| SDL10: I would be able to take responsibility for my own learning | 42.73 | 234.58 | 0.71 | 0.94 |
| SDL11: I would classify myself as someone who is self-disciplined and can get things done on-time. | 42.61 | 234.46 | 0.59 | 0.94 |
| SDL12: I am able to receive constructive feedback from others | 42.77 | 241.02 | 0.57 | 0.94 |
| LC1: I will be able to integrate computer technologies into my learning activities | 42.62 | 236.79 | 0.71 | 0.94 |
| LC2: I would be able to improve my learning by repeatedly reviewing the course materials | 42.58 | 237.42 | 0.62 | 0.94 |
| LC3: I would be able to participate actively in small-group discussions/forums | 42.57 | 240.32 | 0.53 | 0.94 |
| LC4: When it comes to learning and studying, I am a self-directed person (Self-directed learners are individuals that take the initiative and responsibility for learning. They select, manage, and assess their own learning activities) | 42.52 | 234.06 | 0.72 | 0.94 |
| LC5: I would be able to complete my work even when there are online distractions (e.g., friends sending emails or websites to surf) | 42.53 | 233.75 | 0.70 | 0.94 |
| OCSE1: I am comfortable expressing my opinion in writing to others (e.g., with blogs, social networking services, or web pages) | 42.41 | 237.95 | 0.53 | 0.94 |
| OCSE 2: I feel confident in using online tools (e.g., email, discussion) to communicate with others effectively | 42.73 | 238.95 | 0.66 | 0.94 |
| OCSE 3: I feel confident in posting questions in online discussions | 42.50 | 236.21 | 0.62 | 0.94 |
| OCSE4: I am good at giving constructive feedback to others | 42.35 | 237.36 | 0.56 | 0.94 |
| OCSE5: I would be able to ask my classmates and instructors questions | 42.77 | 240.04 | 0.64 | 0.94 |
| CISE1: I feel confident in my knowledge and skills to use software for online learning | 42.53 | 234.45 | 0.69 | 0.94 |

| Item | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| CISE2: I feel confident in performing the basic functions of Microsoft Office programs (e.g., MS Word, MS Excel, and MS PowerPoint) for class assignments | 42.86 | 242.72 | 0.51 | 0.94 |
| CISE3: I feel confident in using the Internet (e.g., Google, Yahoo) to find or gather information for online learning | 42.97 | 243.67 | 0.60 | 0.94 |
| CISE4: I can troubleshoot most problems associated with using a computer | 42.23 | 233.43 | 0.58 | 0.94 |
| CISE5: I know how to install a software to support my learning using computers | 42.43 | 234.91 | 0.58 | 0.94 |

Note. SDL: Self-directed learners (12 items), LC: Learner control (5 items), OCSE: Online communication self-efficacy (5 items), and CISE: Computer/Internet self-efficacy (5 items). True or false perceptions to online readiness scale: 1 = True, 2 = Neither true nor false, 3 = False.

Cronbach α for the motivations scale was .886, revealing a very good internal consistency. We also examined the total-item correlation and the corrected item-total correlation (SPSS Tutorial: Cronbach α , 2021). Finally, we estimated the Cronbach Alpha if that item is deleted for each item. Since all the correlation results were more significant than $r = .30$, we did not exclude any of the items (SPSS Tutorial: Cronbach α , 2021). The results of the Item-total statistics are in Table 4.

Table 4
Item-Total Correlation. Motivation to Online Learning Scale

| Item | Mean if Item Deleted | Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|----------------------|--------------------------|----------------------------------|----------------------------------|
| IM1: Acquiring technical knowledge/ academic skills | 22.23 | 101.25 | 0.61 | 0.90 |
| IM2: Convenience | 22.46 | 101.78 | 0.64 | 0.90 |
| IM3: Distance from campus- no need to relocate | 22.49 | 101.66 | 0.58 | 0.90 |
| IM4: Flexible pacing for completing the program | 22.48 | 100.96 | 0.68 | 0.89 |
| IM5 - Pursuing a degree | 22.14 | 96.07 | 0.70 | 0.89 |
| IM6: Time constraints due to work responsibilities | 22.42 | 102.05 | 0.60 | 0.90 |
| IM7: Personal enrichment or benefits | 22.09 | 97.88 | 0.68 | 0.89 |
| IM8: For the enjoyment of learning new information | 21.78 | 100.09 | 0.53 | 0.88 |
| EM1: Advancement in current job | 22.05 | 95.00 | 0.67 | 0.82 |
| EM2: Current job requirement | 21.02 | 99.46 | 0.38 | 0.85 |
| EM3: Future employment goals | 21.88 | 94.54 | 0.67 | 0.83 |
| EM4: Salary increase | 22.16 | 98.21 | 0.55 | 0.85 |

Note. MI: Intrinsic Motivating Factors (7 items), EM: Extrinsic Motivating Factors (4 items). True or false perceptions to motivating factors to online learning: 1 = Completely true, 2 = Somewhat true, 3 = Neither true nor false, 4 = Somewhat false, and 5 = Completely false.

Objective 2: Describe the participants' demographic characteristics and their previous experience with online learning

Of 531 respondents, slightly more than four in 10 were from SC (42%), 30% from NC, and 29% from GA. The majority were females (59%). Most were white non-Hispanics (86%), 12% preferred not to say, 8% were Black or African American, 2% were multi-racial, 2% were Hispanics, and 1% were Asian-Americans. Almost half of the participants had completed a master's degree (47%), while 35% completed a bachelor's degree. Furthermore, 12% had completed coursework beyond a master's degree, 3% had a specialist degree, and 3% had a doctorate. Participants' age ranged as follows 18% were younger than 23 years old, 36% were between 24-30 years old, 26% were between 31-40, and 27% were between 51-60 years old. Participants' professions were reported as follows: 70% were Cooperative Extension professionals, 26% were school-based agricultural educators, and 4% were agricultural service agency employees, either working at the Natural Resource Conservation Agency or the Farm Service Agency. Table 5 presents the demographic information.

Table 5
Demographic Characteristics

| Demographic characteristics | Category | Frequency | Percentage |
|-----------------------------|---|-----------|------------|
| State | South Carolina | 156 | 30% |
| | North Carolina | 219 | 42% |
| | Georgia | 151 | 29% |
| Gender | Female | 207 | 59% |
| | Male | 312 | 39% |
| Race/Ethnicity | White Non-Hispanics | 449 | 86% |
| | Black/African American | 40 | 8% |
| | Hispanics | 8 | 2% |
| | Asian-American | 3 | 1% |
| | Multi-Race | 9 | 2% |
| | Prefer not to say | 63 | 12% |
| Education | Bachelor's degree completed | 180 | 35% |
| | Master's degree completed | 245 | 47% |
| | Coursework beyond Master's degree completed | 63 | 12% |
| | Specialist degree completed | 17 | 3% |
| | Doctorate degree completed | 13 | 3% |
| Age range | 23 years old and younger | 17 | 18% |
| | 24-30 years old | 105 | 36% |
| | 31-40 years old | 125 | 26% |
| | 51-50 years old | 80 | 27% |
| Profession | Cooperative Extension professionals | 364 | 70% |
| | School-based agricultural educators | 133 | 26% |
| | Agricultural Service Agency employees | 18 | 4% |

When we asked about their educational needs, most participants said (69%) indicated that they do not need to take graduate courses during the next five years. We asked participants about the likelihood they would apply for admission to the Master's in Agricultural Education degree program offered online through Clemson University. Most participants declined to answer this question (64%), and 7% reported they were unwilling to apply or were not likely to do it (17%). A small proportion (12%) indicated they were likely to apply for admissions.

More than one-half of the participants (56%) had experience with online learning and had taken four or more online courses. Slightly more than one in five (22%) had taken between 2-3 courses, while 8% had taken at least one class. Only 14% had no experience with online learning. Most participants who had taken an online course before (82%) did not drop the class, and those who did drop the course cited a limited time, a lack of encouragement from the instructor, and family or job incompatibility and personal problems.

Regarding the learning tools used, most (97%) selected search engines such as Google or Bing, and 87% reported using image databases such as USDA, ARS image gallery, Google, NASA, etc. Further, 72% reported using Wikis, and 59% used statistical data from institutions such as NASS, NHI, NSF, etc.

Objective 3: Assess participants' readiness to pursue an online Master's program in agricultural education *Self-directed Learning*

Participants indicated that they believe (97%) that they can receive constructive feedback from others. Most participants indicated a proclivity for self-directed learning as 95.8% indicated they have high expectations for their learning performances and 94.8% would take responsibility for their own learning. Furthermore, 94% would be able to seek assistance when facing problems, and 91.8% would classify themselves as someone who is self-disciplined and can get things done on time. They are good at completing tasks independently (i.e., I won't need others to encourage or remind me to complete assignments).

Learner Control Dimension

Nearly all participants (89.9%) responded they would improve their learning by repeatedly reviewing the course materials, and they would also integrate computer technologies into their learning activities (93%). Furthermore, 88.1% would be able to complete their work even when there are online distractions (e.g., friends sending emails or websites to surf), and 90.1% could participate actively in online small-group discussions/forums.

Online Communication Self-Efficacy

Almost all the respondents would be able to ask classmates and instructors questions (93.8%); felt confident in using online tools (e.g., email, discussion) to communicate with others effectively (93.6%), and 86.9% felt confident in posting questions in online discussions.

Computer/Internet Self-Efficacy

The vast majority (97.7%) felt confident in using the Internet (e.g., Google, Yahoo) to find or gather information for online learning, and 94.6% felt confident in performing the basic functions of Microsoft Office programs for class assignments. Additionally, more than a majority of participants felt confident in their knowledge and skills in using software for online learning (88.8%). Table 6 outlines the descriptive statistics of each dimension of online readiness.

Table 6

Online Readiness Scale Frequencies and Percentages in Order of Agreement

| Item | True | | Neither or False | | True False | |
|---|----------|------|------------------|-----|------------|-----|
| | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % |
| Self-directed learning dimension | | | | | | |
| SDL12: I am able to receive constructive feedback from others | 486 | 97 | 8 | 1.6 | 7 | 1.4 |
| SDL5: I have high expectations for my learning performance | 480 | 95.8 | 15 | 3.0 | 6 | 1.2 |
| SDL10: I would be able to take responsibility for my own learning | 474 | 94.8 | 16 | 3.2 | 10 | 2.0 |
| SDL7: I would be able to seek assistance when facing problems | 471 | 94 | 15 | 3.0 | 15 | 3.0 |
| SDL2: I am good at completing tasks independently (i.e., I won't need others to encourage or remind me to complete assignments) | 459 | 91.8 | 13 | 2.6 | 28 | 5.6 |
| SDL9: I would be able to set up deadlines to meet my goals | 457 | 91.2 | 20 | 4.0 | 24 | 4.8 |
| SDL11: I would classify myself as someone who is self-disciplined and can get things done on-time | 456 | 91.2 | 27 | 5.4 | 17 | 3.4 |
| SDL1: I would be able to use feedback to evaluate my performance (i.e., self-critique) | 444 | 89 | 32 | 6.4 | 23 | 4.6 |
| SDL6: I would be able to plan, monitor and evaluate my own learning process | 443 | 88.6 | 26 | 5.2 | 31 | 6.2 |
| SDL3: I would be able to carry out my own study plan | 442 | 88.6 | 35 | 7.0 | 22 | 4.4 |
| SDL8: I would be able to set up my learning goals | 436 | 87.2 | 42 | 8.4 | 22 | 4.4 |
| SDL4: I do not give up easily when confronted with technology-related obstacles (e.g., Internet connection issues, difficulty with downloads, difficulty locating information, unable to contact the instructor immediately) | 425 | 84.8 | 33 | 6.6 | 43 | 8.6 |
| Learner control dimension | | | | | | |
| LC1: I will be able to integrate computer technologies into my learning activities | 453 | 93 | 18 | 3.7 | 16 | 3.3 |
| LC2: I would be able to improve my learning by repeatedly reviewing the course materials | 438 | 89.9 | 24 | 4.9 | 25 | 5.1 |
| LC3: I would be able to participate actively in small-group discussions/forums | 436 | 90.1 | 27 | 5.6 | 21 | 4.3 |
| LC4: When it comes to learning and studying, I am a self-directed person (Self-directed learners are individuals that take the initiative and responsibility for learning. They select, manage, and assess their own learning activities) | 430 | 88.5 | 26 | 5.3 | 30 | 6.2 |
| LC5: I would be able to complete my work even when there are online distractions (e.g., friends sending emails or websites to surf) | 429 | 88.1 | 27 | 5.5 | 31 | 6.4 |
| Online communication self-efficacy dimension | | | | | | |
| OCSE5: I would be able to ask my classmates and instructors questions | 453 | 93.8 | 20 | 4.1 | 10 | 2.1 |
| OCSE 2: I feel confident in using online tools (e.g., email, discussion) to communicate with others effectively | 452 | 93.6 | 20 | 4.1 | 11 | 2.3 |

| | | | | | | |
|---|-----|------|----|-----|----|------|
| OCSE 3: I feel confident in posting questions in online discussions | 419 | 86.9 | 32 | 6.6 | 31 | 6.4 |
| OCSE1: I am comfortable expressing my opinion in writing to others (e.g., with blogs, social networking services, or web pages) | 409 | 84.5 | 38 | 7.9 | 37 | 7.6 |
| OCSE4: I am good at giving constructive feedback to others | 400 | 82.8 | 47 | 9.7 | 36 | 7.5 |
| Computer/internet self-efficacy dimension | | | | | | |
| CISE3: I feel confident in using the Internet (e.g., Google, Yahoo) to find or gather information for online learning | 472 | 97.7 | 4 | .8 | 7 | 1.4 |
| CISE2: I feel confident in performing the basic functions of Microsoft Office programs (e.g., MS Word, MS Excel, and MS PowerPoint) for class assignments | 457 | 94.6 | 12 | 2.5 | 14 | 2.9 |
| CISE1: I feel confident in my knowledge and skills to use software for online learning | 429 | 88.8 | 21 | 4.3 | 33 | 5.8 |
| CISE5: I know how to install a software to support my learning using computers | 403 | 83.4 | 36 | 7.5 | 44 | 9.1 |
| CISE4: I can troubleshoot most problems associated with using a computer | 373 | 77.4 | 45 | 9.3 | 64 | 13.3 |

Note. SDL: Self-directed learners (12 items), LC: Learner control (5 items), OCSE: Online communication self-efficacy (5 items), CISE: Computer/internet self-efficacy (5 items). Input lower scores reflect more true/higher readiness of online education.

Objective 4: Examine participants’ motivations for pursuing an online Master’s degree in agricultural education.

The most reported motivating factors to pursue an online master’s degree program were distance from campus—no need to relocate (68%); flexible pacing for completing the program (62%); convenience (59.77%); and time constraints due to work responsibilities (59.50%). Furthermore, the most common extrinsic motivating factors were salary increase (59.42%), advancement in current job (52.43%), and future employment goals (45.63%). The descriptive statistics are shown in Table 7.

Table 7
Descriptive Statistics of Motivating Factors Reported by Participants as Completely True

| Items | Completely True | | | |
|--|-----------------|---------|------|--------------------|
| | Frequency | Percent | Mean | Standard Deviation |
| IMF1: Acquiring technical knowledge/ academic skills | 236 | 45.65% | 1.91 | 1.188 |
| IMF2: Convenience | 309 | 59.77% | 1.66 | 1.079 |
| IMF3: Distance from campus- no need to relocate | 351 | 68.00% | 1.62 | 1.170 |
| IMF4: Flexible pacing for completing the program | 323 | 62.00% | 1.64 | 1.080 |
| IMF5: Pursuing a degree | 269 | 51.93% | 2.01 | 1.413 |
| IMF6: Time constraints due to work responsibilities | 307 | 59.50% | 1.69 | 1.116 |
| IMF7: Personal enrichment or benefits | 226 | 43.71% | 2.02 | 1.272 |

| | | | | |
|---|-----|--------|-------------|-------------|
| IMF8: For the enjoyment of learning new information | 211 | 40.89% | 2.32 | 1.392 |
| Internal motivating factor dimension | | | 1.85 | .91 |
| EMF1: Advancement in current job | 270 | 52.43% | 2.08 | 1.500 |
| EMF2: Current job requirement | 156 | 30.41% | 3.10 | 1.842 |
| EMF3: Future employment goals | 235 | 45.63% | 2.25 | 1.549 |
| EMF4: Salary increase | 306 | 59.42% | 1.96 | 1.487 |
| External motivating factor dimension | | | 2.34 | 1.28 |

Note. MI: Intrinsic Motivating Factors (7 items), EM: Extrinsic Motivating Factors (4 items). True or false perceptions to motivating factors to online learning: 1 = Completely true, 2 = Somewhat true, 3 = Neither true nor false, 4 = Somewhat false, and 5 = Completely false.

Conclusions

To better understand the concepts of online learning readiness and motivation toward online learning, this study proposes using social cognitive theory (SCT) constructs as a theoretical framework. A vast majority of our participants (95.8%) reported a tendency for self-directed learning as they indicated having higher learning expectations performances ($n = 480$). This characteristic relates to the concepts of self-efficacy and outcomes expectations proposed by Albert Bandura (1998). Individuals who perceive themselves as capable of performing a specific task or behavior have high levels of self-efficacy. Outcome expectations are a person's belief that a particular behavior will lead to a specific outcome (Bandura, 1998). Because participants have higher self-efficacy levels, they can recognize the importance of higher expectations for their learning performance and outcome expectancy. Results may suggest that participants who are motivated to pursue an online degree place a high value on being self-directed learners since they can plan, monitor, and evaluate their own learning process. Further, (94%) of our study participants ($n = 471$) responded that they would seek assistance with facing a problem, 82.8% ($n = 400$) would receive constructive feedback from others, and 93.8% ($n = 453$) would ask their classmates and instructors questions. SDL10: I would be able to take responsibility for my own learning ($n = 430$) 88.5%. These results are consistent with findings from other studies, where a positive relationship exists between online readiness and interaction. Interaction among students improves their learning experience and satisfaction with the content and the course. Additionally, the interaction between learners and teachers improves students' attitudes and motivation to learn (Szapkiw & Szapkiw, 2010).

We also conducted validity and reliability analyses of an instrument to measure key concepts from this theoretical framework. Cronbach α for the online learning readiness scale showed an outstanding internal consistency (.944), which concurs with the findings from past studies (Smith, 2005; Chou & Liu, 2005; Doe et al., 2017; Yu, 2018). The Cronbach α for the motivation scale was .866, indicating very good internal consistency consistent with the results reported in the literature. Pintrich and others (1991) used an instrument tool with Cronbach alpha ranged from .52 to .93 (Pintrich & others, 1991). Shih and Gamon's instrument had a .71-.91 internal consistency (Shih & Gamon, 2001), while Russell's study showed a Cronbach's Alpha of .96, indicating an excellent internal consistency (Russell, 2013). One difference between our study and the Miller and Miller (2008) study was that most participants do not need to take graduate courses during the next five years. Some participants in our study said they would likely apply for an online Master's degree from SC (9.97%), and 3% said they would definitely apply. Indicating that demand for online learning exists (12.23%). Our result concurs with the results reported in the literature (Wilson & Moore, 2004; Roberts et al., 2005; Miller & Miller, 2008; Miller & Miller, 2009). Overall, the study provides valuable information on participants' readiness for online learning and their motives to pursue an online Master's degree in program Agricultural Education.

Limitations of the study

Qualtrics XM, by default, permits recording an incomplete survey after one week. During the pilot intervention, the lead researcher did not change to one month to allow participants more time to complete the survey. Therefore, many surveys were saved empty. The research team agreed to discard them. A second limitation was identified during follow-up calls to address non-response bias. Many employees from Agricultural service agencies did not receive the invitation to participate in the study since their email security system filtered the email. Other employees did not complete the survey since they needed clearance from the Office Director. Dillman, Smith, and Christian (2014) recommend one way to increase response rate would be to send a postal letter to bring attention to the email request they are about to receive (Dillman et al., 2014). However, to do this task, researchers would have to plan for that in their budget. Another way to improve the response rate would be to make the survey shorter to avoid burden and fatigue and to provide incentives. Finally, due to this study being a census, generalizations cannot be made to other populations, only to SBAE, Cooperative Extension Agents, and professionals in Agricultural service agencies employees from SC, NC, and GA.

Practical recommendations

Since online learning is a more flexible environment, the Agricultural Education faculty should consider converting existing programs or developing new programs with asynchronous format, or combining both designs, ensuring the flexibility of the environment, the learning content, and the class layout. Most participants (62%) chose flexibility as their primary motivator to pursue an online Master's degree. Many preferred asynchronous learning over synchronous because it is convenient (59.77%), but they face time constraints due to job responsibilities (59.50%). Faculty from Agricultural Education departments should seek methods to promote interaction between students, students with instructors, and students with the structure to facilitate the learning process. Recommendations for the program director of the online Master's degree in Agricultural Education is to include the instrument survey as part of the application process to assess how ready prospective students are to become online learners. Also, the director could add a disclaimer on the program's website about the self-directed and self-motivated nature of the degree. Furthermore, Universities offering online degrees can include this instrument tool on their website so prospective students interested in pursuing an online degree can have a deeper understanding of how to be successful online learners. By completing this instrument tool, prospective online learner students will be aware of the characteristics needed to be successful online learning students. Finally, each Department could develop and offer a tutorial to all prospective online students and faculty on the technologies and skills needed to be successful online learners and teachers.

Recommendations for future research

We recommend conducting a similar study from a national perspective to understand how ready-to-learn online SBAE, Agricultural Extension agents, and professionals in Agricultural Service Agency employees are to pursue a professional online Master's degree in Agricultural Education. A national study can provide a deeper understanding of online learning readiness and motivation for online learning. Furthermore, individual programs across the country should consider replicating this study with their target audience to determine the readiness and motivating factors for an online degree in Agricultural Education. We recommend that a follow-up study be conducted using a qualitative methodology to further understand students' online learning perceptions.

References

- Cabi, E., & Kalelioglu, F. (2019). A fully online course experience from students' perspective: Readiness, attitudes, and thoughts. *Turkish Online Journal of Distance Education*, 165-180. <https://doi.org/10.17718/tojde.601934>
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 4723952093401. <https://doi.org/10.1177/0047239520934018>
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). John Wiley & Sons, Incorporated.
- Falloon, G. (2011a). Making the Connection. *Journal of Research on Technology in Education*, 43(3), 187-209. <https://doi.org/10.1080/15391523.2011.10782569>
- Falloon, G. (2011b). Making the Connection: Moore's Theory of Transactional Distance and Its Relevance to the Use of a Virtual Classroom in Postgraduate Online Teacher Education. *Journal of Research on Technology in Education*, 43(3), 187-209. <https://doi.org/10.1080/15391523.2011.10782569>
- Gall, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational research: An introduction, 6th ed.* Longman Publishing.
- Hung, M. L., Chou, C., Chen, C. H., & Own, Z. Y. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers & Education*, 55(3), 1080-1090. <https://doi.org/10.1016/j.compedu.2010.05.004>
- Liaw, S. S. (2001). Developing a user acceptance model for Web-based learning. *Educational Technology*, 41(6), 50-54. <https://www.jstor.org/stable/44428710>
- Miller, G., & Miller, W. W. (2005). Trends in learner characteristics and program related experiences associated with two off-campus Agriculture degree programs. *Journal of Agricultural Education*, 46(4), 2-12. <https://doi.org/10.5032/jae.2005.04002>
- Moore, J. L., Dickson-Deane, C., & Galyen, K. (2011). E-Learning, online learning, and distance learning environments: Are they the same? *The Internet and Higher Education*, 14(2), 129-135. <https://doi.org/10.1016/j.iheduc.2010.10.001>
- Moore, M. G., & Diehl, W. (2013). Chapter 5: The Theory of Transactional Distance. *Handbook of Distance Education*. Routledge.
- Pillay, H., Irving, K., & Tones, M. (2007). Validation of the diagnostic tool for assessing Tertiary students' readiness for online learning. *Higher Education Research & Development*, 26(2), 217-234. <https://doi.org/10.1080/07294360701310821>
- Radhakrishnan, G. (2013). Non-experimental research designs: amenable to nursing contexts. *Asian Journal of Nursing Education and Research*, 3(1), 25-28. <http://indianjournals.com/ijor.aspx?target=ijor:ajner&volume=3&issue=1&article=007>

- Rossi, M. M., Layfield, K. D., Agudelo, P., Donaldson, J., & Luo, Y. (2021). An assessment of the needs of school-based agricultural educators and other professionals in agricultural service agencies for a professional online master's degree in agricultural education [Doctoral dissertation Tiger Prints https://tigerprints.clemson.edu/all_dissertations/2946]
- Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Contemporary Educational Psychology*, 60, 101832. <https://doi.org/10.1016/j.cedpsych.2019.101832>
- Singh, V., & Thurman, A. (2019). How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018). *The American Journal of Distance Education*, 33(4), 289-306. <https://doi.org/10.1080/08923647.2019.1663082>
- Smith, P. J., Murphy, K. L., & Mahoney, S. E. (2003). Towards identifying factors underlying readiness for online learning: An exploratory study. *Distance Education*, 24(1), 57-67. <https://doi.org/10.1080/01587910303043>
- Sullivan, G. M. (2011). *A primer on the validity of assessment instruments*. Journal of Graduate Medical Education. <https://doi.org/10.4300/JGME-D-11-00075.1>
- Wilson, E., & Moore, G. (2004). Factors related to the intent of professionals in agricultural and extension education to enroll in an on-line master's degree program. *Journal of Agricultural Education*, 45(4), 96-105. <https://doi.org/10.5032/jae.2004.04096>