frontiers | Frontiers in Education

TYPE Original Research
PUBLISHED 23 October 2023
DOI 10.3389/feduc.2023.1252353

OPEN ACCESS

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RECEIVED 03 July 2023
ACCEPTED 09 October 2023
PUBLISHED 23 October 2023

CITATION
Maynard RCI, Pennisi SV and Lombardini L (2023) Identifying faculty opinions about implementing an online, non-thesis master's degree.
Front. Educ. 8:1252353.
doi: 10.3389/feduc.2023.1252353

Identifying faculty opinions about implementing an online, non-thesis master's degree

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Introduction: Although distance education is a growing field, there are benefits and challenges in creating and implementing new online degrees. Faculty play a critical role in forming new online programs and hold differing perceptions about online learning. The purpose of this research was to identify faculty opinions about implementing an online, non-thesis master's degree as an alternative to the existing thesis-based degree.

Methods: In this study, 17 faculty members in the field of horticulture were surveyed at a major university in the southeastern United States. Q methodology was selected as the research tool to identify the primary opinions faculty held about an online, non-thesis master's degree. Once participants were surveyed, factor analysis was used to reduce the responses into three perspectives.

Results: Three distinct perspectives were summarized as: (A) in-person instruction is more effective than online education, (B) online programs increase accessibility to graduate degrees, and (C) successful online programs require independent learners. Participants holding the first perspective believed an online program would not benefit student learning and would increase the workload of faculty. Participants with perspectives B and C agreed that an online program would be beneficial in reaching a broader audience of students. Although perspective C placed a high importance on independent learning, perspectives A and B indicated engaging with students was critical to student learning.

Discussion: All factors agreed an online degree would help our department reach non-research-oriented students. However, there was discrepancy in faculty willingness to support the program. Based on the identified faculty perspectives, it is believed that an online, non-thesis master's would be successful if faculty who are willing to participate in the online degree were trained to be effective online educators and if they encouraged students to hold a deeper level of engagement with the content.

KEYWORDS

faculty opinions, online degree, non-thesis, Q methodology, mixed methods

1. Introduction

Distance education is an increasingly popular option with abundant access to online resources and emerging technologies which allow for collaborative learning in an asynchronous format (Lee, 2017). Graduate students report selecting distance education as the best option for continuing their education while employed full time and are drawn to online programs for their convenience and flexibility (Harris and Martin, 2012; Ilgaz and Gulbahar, 2017). In Fall 2021, 3.2 million students were enrolled in graduate degree programs in the United States, and 40% of those students were exclusively taking online courses (U.S. Department of Education, 2021).

Although online graduate degrees are common, there is a striking lack of availability for students interested in pursuing a graduate degree in horticulture. As of the 2021–2022 academic year, 23 institutions in the United States offered a master's in horticulture. Of these programs, only four institutions had a fully online, non-thesis option causing a discrepancy in career requirements and educational opportunity (Institute of Education Statistics, 2022). For example, many positions such as Extension Agents, directors of botanical gardens, and instructors at community and technical colleges require a master's degree without the need for research-based skills (Seed Your Future, 2020; O*Net OnLine, 2023). Therefore, these positions may easily be filled by candidates with online degrees.

An online, non-thesis master's degree option would broaden the educational opportunities for students pursuing specialized, non-research positions. Additionally, distance education would make a department's graduate program more accessible to employed individuals with limited schedule flexibility (Coleman and Berge, 2018). One important variable impacting the availability of online graduate degrees is support from the department's faculty. One third of leaders in higher education institutions in the United States reported that faculty attitudes towards online education is a significant hinderance to the growth of online programs (Elaine et al., 2016). Therefore, this research aimed to investigate what factors influence faculty support or disagreement with online programs. This study identified the perceived impact of implementing a new online, non-thesis master's degree by surveying horticulture faculty at a major university in the southeastern United States.

2. Literature review

2.1. Student perspectives of online graduate programs

Several studies have investigated the success of graduate students in online programs. In Malaysia, online learning is a new option, which gave researchers a unique opportunity to study graduate students' experiences with a newly developed online program. The study surveyed online Master of Education students enrolled part time or full time. Although the respondents found it more challenging to get help from the instructor in an online format, they reported the online format did not decrease their motivation to learn. Also, most respondents said online learning was supportive of their individual learning needs. However, many students were not comfortable with this new instructive method and preferred face-to-face programs (Tareen and Haand, 2020).

A study of online graduate business students at a university in Australia identified a correlation between student self-efficacy and success in online programs. Two factors contributing to self-efficacy were the attitude of the student and digital literacy. Students who had high self-efficacy demonstrated greater engagement with other students in the course and interacted more with the learning management system. It was recommended that educators should take care to improve the capacity of all students to effectively use the digital technologies selected in their classroom to improve their chance of success in an online program (Prior et al., 2016).

A study of graduate students in online thesis and non-thesis degrees in Turkey found that students were more prepared for online learning if they were self-directed and had control over the learning process (Kaymak and Horzum, 2013). Additionally, students were more satisfied with their online classes when they could self-regulate their learning and efficiently manage their time (Kara et al., 2019; Landrum, 2020). Kaymak and Horzum (2013) also found a negative interaction between student readiness and course structure meaning the more prepared students were to enter an online program, the less course structure they needed. The implications of this study are that if students are not ready to enter an online program, they will need more support from the instructor in terms of a well-designed course structure to be successful.

Another indicator of student success in online programs is how interactive they are. The more interaction students have with the content, instructor, and other students, the more likely they are to meet their learning needs (Kaymak and Horzum, 2013). For example, online graduates enrolled in a Master of Arts program in the United States reported their best experiences with online learning involved sharing their knowledge with classmates (Holzweiss et al., 2014). Although it can be challenging to have consistent interactions with other students in an online class, student retention in online programs is greatest when they hold quality interactions with the instructor (Harris and Martin, 2012; Kara et al., 2019).

2.2. Faculty perspectives of online graduate programs

For online programs to be successful, graduate departments need willing and engaged faculty to teach online courses. However, several barriers have been identified that prevent instructors from beginning or continuing online courses. The first barrier is the time needed to create online content (Kellen and Kumar, 2021). Some time-consuming factors for new online classes include creating an effective instructional design and learning new software and technology (Rockwell et al., 1999). However, faculty who teach online and face-to-face courses reported their total workload did not differ between the two delivery formats (Thompson, 2004). Once an online course is established, faculty report the majority of their time is spent grading and communicating with students (Thompson, 2004; Mandernach et al., 2013).

Another concern for faculty is the perceived value of online instruction (Kellen and Kumar, 2021). This is evidenced by employers who do not view online and in-person degrees as equal. A study by Lennon (2021) indicated that employers are twice as likely to respond to applicants who were awarded an in-person degree as opposed to an online degree. Prospective employers perceived online degrees as less rigorous, lacking in-person interactions, and having the potential for academic dishonesty. However, they also recognized student self-direction and discipline as unique benefits of online education (Columbaro and Monaghan, 2008). Despite faculty and employer apprehensions about the quality of an online degree, a multi-year study of graduate students enrolled in several courses in Scotland and Sweden indicated there was no performance difference between the online and face-to-face students (McPhee and Söderström, 2012).

Faculty also lack confidence in delivering online lectures (Kellen and Kumar, 2021). Because online classes create distance between the student and the instructor, appropriate use of technology paired with constructive pedagogy is essential for effective online instruction. Also, since online courses lack non-verbal cues, communication between faculty and their students can be challenging (Holzweiss

et al., 2014). One way instructors can improve communication with the student is by providing feedback in a video or audio format (Davis et al., 2019). Successful online education not only relies on the instructor to remain current with changing technology and communicate well with students, but the students must also take an active role in the learning process (Joshi et al., 2022). It has been shown that self-regulation is critical to student success in online courses (Ye and Pennisi, 2022). Whereas face-to-face courses rely on students self-reporting their engagement with course content, online learning management systems allow instructors to monitor the frequency and duration of student engagement with the content to ensure the students are making appropriate advancements through the course (Davis et al., 2019). Overall, students must self-regulate their learning, manage their time effectively, and receive sufficient feedback from their instructor to be successful in an online program (Lee, 2017).

In addition to the barriers that prevent faculty from starting an online course, several factors influence faculty satisfaction with online teaching. Satisfaction is higher when faculty have autonomy in designing their courses and more interactions with students. However, they are dissatisfied with student evaluations, which tend to be lower in online courses and can negatively contribute to promotion and tenure (Marasi et al., 2020). Faculty satisfaction with and perception of online instruction may be influenced by the lockdown period of the Covid−19 pandemic when many institutions were forced to transition online. This is particularly true for faculty who had no previous experience teaching in an online format. However, their abrupt transition online is not comparable with faculty who have well-constructed online courses (Marasi et al., 2020).

3. Materials and methods

3.1. Q methodology

This research aimed to determine faculty opinions on the addition of an online, non-thesis master's degree to the existing thesis option. Q methodology was selected as the research tool because it allows analysis of both divergent and mutual opinions. Because individual opinions are subjective and vary from person to person, they are challenging to study (Brown, 2019). However, Q methodology, introduced by William Stephenson in the 1930s (Stephenson, 1935), is a way of studying human subjectivity in a quantitative, systematic manner (Herrington and Coogan, 2011; McKeown and Thomas, 2013). The goal of Q methodology is not to identify a single truth but to investigate the diversity of opinions held by many individuals (Cross, 2004). A drawback of other survey tools is they tend to report consensus statements and minimize periphery viewpoints. Conversely, Q methodology attempts to explore all viewpoints relating to the given topic and can derive greater meaning than Likert-scale studies (Lundberg et al., 2020). For the purpose of this study, it is important to recognize all opinions held by faculty in the department, making Q methodology a useful research tool.

Q methodology has been used extensively in education research. Lundberg et al. (2020) analyzed the use of Q methodology in 74 studies conducted in the United States, the United Kingdom, Australia, and South Korea about compulsory education. These studies used Q methodology as a research tool to investigate teachers' and students' understanding of a subject, attitudes and values, critical reflection, evaluation of educational issues, preference in responding to issues, and method of decision making (Lundberg et al., 2020). Q methodology has also been used at the university level in many studies including investigating students' motivation for learning (Zheng et al., 2020), faculty opinions about student evaluations (Wu and Wang, 2021), and faculty opinions on using technology in the classroom (Clausen et al., 2021).

One study used Q methodology to determine faculty opinions about shifting classes online during the Covid−19 pandemic (Ramlo, 2021). The study identified three distinct perspectives. The first perspective was comprised of faculty who enjoy teaching and are proficient with using technology. They had previous experience teaching online and transitioned well to fully online classrooms but valued hands-on experiences in face-to-face classrooms. Another group of faculty generally experienced feeling overwhelmed during the pandemic, but not necessarily because of shifting their courses online. The third group of faculty had a strong and challenged by having to learn a new way of teaching (Ramlo, 2021). Although the subject of Ramlo's (2021) study is similar to the present research, one clear distinction is the motivation for moving to online instruction. Whereas during the lockdown period of the pandemic, instructors were forced to move into an exclusively online format, the present study investigates the willingness or reluctance of faculty to adopt an online program. The significance of this distinction is faculty would have time to prepare and be trained for online instruction.

3.2. Research instrument

The initial step in Q methodology is the development of a Q concourse. The concourse is a collection of opinion-based statements representing all possible opinions on the subject, which makes it theoretically limitless (Brown, 2019). The concourse is traditionally developed from focus groups and interviews, but it can also be formed from previous research articles (Brown, 2004). For this study, statements for the Q concourse were collected from three different sources. Statements were inspired from major themes in previous research including time required to develop online courses, lack of confidence in teaching online, the perceived reduction in value of online courses compared to face-to-face instruction, the need for external support, the convenience of online programs for students, the students' needs for quality interactions, and the ability of students to take an active role in the learning process (Rockwell et al., 1999; Harris and Martin, 2012; Kaymak and Horzum, 2013; Holzweiss et al., 2014; Elaine et al., 2016; Ilgaz and Gulbahar, 2017; Kara et al., 2019; Landrum, 2020; Kellen and Kumar, 2021; Joshi et al., 2022; Ye and Pennisi, 2022).

Next, a focus group was formed during the strategic planning of an online, non-thesis option for a master's in horticulture to identify additional themes of interest. In this focus group, several potential benefits and challenges of this new degree were recognized including creating new interest in the field of horticulture by making the graduate degree more accessible, the ability of a new degree option to bring more funding to the department, and whether a new program should be the shared responsibility of all graduate faculty in the department. These ideas were recorded as a list of opinion-based statements and added to the Q concourse.

Finally, to ensure faculty opinions were expressed in the concourse, all graduate faculty in the department were surveyed. Before the survey, they were told the basic structure of a potential online master's which included converting the same courses required for the thesis-based degree into an online format, requiring twice as many course credit hours, and removing the thesis requirement. Since the online master's had not been developed yet, an anonymous survey was distributed to all graduate faculty asking: "What would the implementation of an online, non-thesis master's degree mean to you?" Many faculty responses to the survey were similar, but each statement was recorded individually.

From the Q concourse, five themes were identified including the growth of the department, quality of the degree, faculty responsibility, implications for teaching, and impact on the student. Based on these five categories, the concourse was then reduced in an attempt to summarize the primary viewpoints (Stephenson, 1978). Each of the 50 statements from the Q concourse was considered individually. Statements with similar meanings were combined, but any statement that represented a unique perspective was maintained in the list. The Q concourse was reduced to a list of 34 representative statements forming the Q set. The Q set, shown in Table 1, was reviewed by the department head, two faculty members, and a graduate researcher to ensure its completeness and clarity.

3.3. Study population

The graduate faculty invited to participate in this study included 31 members with varying appointments in instruction, extension, and research. Twenty-six of them taught courses for graduate students and six had fully online courses that were developed outside of the Covid−19 lockdown period. Seventeen faculty had formal academic responsibility with a teaching appointment ranging from 5 to 86%; however, only six had a high teaching responsibility. Because all graduate faculty, regardless of their instruction appointment, may interact with graduate students in an advisory capacity, all members of the graduate faculty were invited to participate in the study. The faculty included 15 Professors, seven Associate Professors, eight Assistant Professors, and one Senior Public Service Associate with a full appointment in extension. The age of faculty also varied with five aged 30–40, seven aged 41–50, 12 aged 51–60, and seven aged 61–70. The teaching experience of the faculty is expected to differ based on the wide age range and difference in teaching responsibility within the department.

Although all graduate faculty were invited to participate in the study, only 17 responded, giving a response rate of 55%. Because some faculty chose not to participate, the response rate may be a limitation of the study. Without complete participation, it is challenging to infer what percentage of the faculty population falls under each of the perspectives analyzed. However, the number of participants was deemed sufficient based on Watts and Stenner's (2012) recommendation of having half as many participants as Q statements. In general, Q research studies do not require a large participant population because the aim is to identify distinct viewpoints and analyze them further. Watts and Stenner (2012) state that unique perspectives identified by factors may be identified with as few as one participant significantly loading onto the factor (Watts and Stenner, 2012).

3.4. Data collection

In Q methodology, data is collected by participants sorting statements in the Q set. This sorting is often conducted in person, but to maintain the anonymity of research participants and minimize subjective bias, the Q sort was administered online. The EQ Web Sort platform (version 1.0.2), created by Shawn Banasick and made available through GitHub, was used to configure this Q study in an online format. All graduate faculty in the department were provided with a URL link to the Q set and asked to initially sort the randomized statements into three categories: statements they agreed with, had neutral feelings about, or disagreed with. After the initial sorting, participants were asked to re-sort the statements into a forced, quasi-normal distribution from "most agree" (+4) to "least agree" (−4), forming the individual Q sort (Brown, 1993). It is important to note that statements ranked with a negative value do not necessarily mean the individual disagreed with the statement. Rather, their opinions were more closely aligned with statements ranked with a higher value. An example of the completed Q sort is shown in Figure 1.

Once participants completed the Q sort, they were asked to explain the statements they agreed the most and least with through an open-ended question in the online survey. Demographic information was collected through an anonymous survey to identify potential relationships between the factors and teaching experiences of the participant. Questions included their instruction appointment, whether they teach graduate classes, whether they have experience teaching online classes, how many graduate students they advise, how many graduate committees they serve on, and how many professional development activities related to teaching they had participated in the past 5 years.

3.5. Statistical analysis

A distinguishing feature of Q methodology is its use of factor analysis to group individual responses into fewer viewpoints. A participant's Q sort represents the overall perceptions of the individual. If other participants Q sorts are highly correlated, they are grouped together to form a factor. Individuals within a factor will have a similar perspective, whereas each factor represents a different viewpoint (Watts and Stenner, 2005). Although factor analysis attempts to explain as much of the variance among Q sorts as possible, reducing the number of factors analyzed also reduces the number of viewpoints that can be described. Therefore, Q methodology is a mixed methods approach using quantitative statistical analysis combined with qualitative abductive reasoning to extract the appropriate number of factors.

Results from the Q sorts were analyzed using the KADE software (version 1.2.1; Banasick, 2019). First, the Q set and all faculty responses were uploaded to the software, and a correlation matrix was formed to compare how similar or dissimilar individual sorts were to one another (Brown, 2004). Next, principal component analysis with forced Q sorting was used to isolate factors. Eight factors were initially identified by the software, and the Kaiser-Guttman criterion recommends maintaining all factors with an eigenvalue greater than 1.00 (Shrestha, 2021). In this study, six factors had an eigenvalue greater than 1.00. However, three of the six factors only had one Q sort significantly loading onto the factor. Because factor analysis is

TABLE 1 A set of 34 neutral, subjective statements were compiled to address different opinions faculty may hold about the implementation of an online, non-thesis master's degree.

Growth of the department	
1	This degree would make our department more visible
2	This degree would make our department more competitive in terms of attracting students
3	This degree would bring additional funding to our department
4	Without a research component, more students may be interested in studying horticulture
5	This degree would have a minimal impact on our graduate program
6	There is a current need for this degree in our department
7	Online programs produce competitive professionals
8	Non-thesis programs produce competitive professionals
Quality of the degree	
9	This degree would be valuable to employers
10	This degree would be valuable for students
11	This degree would prepare students to obtain a non-research industry position
12	I would be willing to recommend a student from this program to an industry position
13	This degree would maintain the value of our current graduate program
Faculty responsibility	
14	This degree would increase the workload of faculty members
15	This degree would have minimal benefit to me
16	Additional faculty should be hired to teach the online classes
17	This degree should be a shared responsibility among all graduate faculty
18	Only faculty with teaching appointments should assist with this degree
19	Additional staff should be hired to recruit students
20	Additional staff should be hired to advise students
Implications for teaching	
21	Online classes would give greater flexibility in teaching
22	In the long-run, online courses would require less preparation time
23	My teaching would be as effective online as it is face-to-face
24	I would be willing to develop an online course if I had technical assistance
25	Online classes require more resources to be engaging for students
26	I would be willing to learn more about online delivery options
27	I would need significant training to teach an asynchronous online course
Impact on the student	
28	This degree would be helpful for students with limited schedule flexibility
29	This degree would allow more students to obtain a graduate degree
30	Students in an online program should have self-regulating study habits
31	Online programs should incorporate networking opportunities for students
32	Students in an online program should participate in at least one in-person networking event with faculty
33	This degree would help us reach non-research-oriented students
34	Student learning depends on level of engagement in online courses

These statements were the Q set used to survey faculty opinions in the Department of Horticulture at the University of Georgia.

intended to reduce the number of variables in a data set, it is not useful to form factors with fewer than two Q sorts (Watts and Stenner, 2005). Yeomans and Golder (1982) identified that the Kaiser-Guttman criterion can result in an inaccurate prediction of the appropriate number of factors. Therefore, only three factors were selected for analysis to account for as much of the variance of each Q sort as possible (Table 2).

Once three factors were selected for analysis, a varimax rotation was used to reduce the many opinions expressed in the Q sorts into a few core ideas (McKeown and Thomas, 2013). Varimax rotations present the most mathematically significant factor loadings by representing as much study variance as possible in the factors. Additionally, varimax rotations minimize researcher bias by preventing manual, judgmental rotations (Watts and Stenner, 2005).

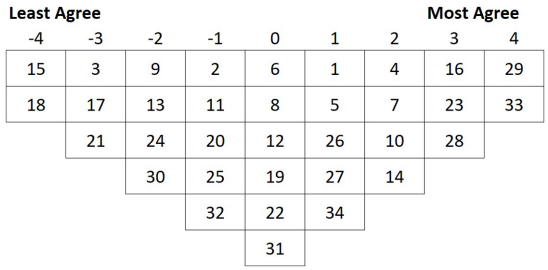

FIGURE 1
A quasi-normal distribution ranging from most agree (+4) to least agree (−4) was used for the Q sort in this study. Each square on the distribution is a placeholder for a statement number. This figure shows an example of a completed Q sort from a participant in Factor B. The forced distribution ensures participants consider the importance of each statement with respect to every other statement.

TABLE 2 Factor analysis was used to group faculty opinions on the implementation of an online, non-thesis master's in horticulture.

Q sort	Factors		
	A	B	C
Participants loading onto factor (no.)	6	4	4
Study variance explained (%)	28	12	10

Of the 17 survey participants, 14 faculty significantly loaded onto three factors (A, B, and C). These factors explain 50% of the total study variance.

Although the software automatically loaded participants into the three factors, the factor loadings were only considered statistically significant at $p \leq 0.05$. Therefore, three factors with several significantly loading participants were created using this method of factor analysis. Next, composite Q sorts were created for each factor which are weighted averages of each of the factor loadings showing how each statement is ranked by the factor. Therefore, an individual factor is an idealized Q sort comprised of several individual Q sorts representing the shared perspective of all participants within a factor (Stephenson, 1978).

The perspective of each factor was interpreted using the crib sheet method described by Watts and Stenner (2012), which uses abductive reasoning to identify key characteristics of each factor. This method examines the highest and lowest ranking statements in each factor as well as each of the statements ranked at more extreme values than any other factor. The crib sheet method was used to isolate defining statements for each of the factors. Additionally, the post-sort survey responses were used to confirm placement of individuals into each factor. Each of the distinguishing statements identified with the crib sheet method and the survey responses were used to form a theory about the entire factor. Therefore, both quantitative data from the factor analysis and qualitative data from the abductive reasoning were used to generate the factors.

4. Results

The three analyzed factors explained 50% of the study variance. Six participants significantly loaded onto Factor A and four participants significantly loaded onto Factors B and C. Three Q sorts did not significantly align with any of the factors. Rather, they shared opinions with more than one factor and were excluded from individual factor analysis. These composite Q sorts for each factor are summarized in Table 3. Responses to post-sort survey questions were used to support the perspectives of each factor.

Of the 17 participants, only seven responded to the follow-up survey about their teaching experience. For this survey, one respondent loaded onto Factor A, two respondents loaded onto Factor B, three respondents loaded onto Factor C, and one did not load significantly onto any factor. Due to low participation in the post-sort survey, sufficient demographic information was not available to describe each of the factors, which is one limitation of the study. Therefore, the teaching experience survey was not included in the factor analysis. The perspectives expressed in the Q sort from each of the three factors are described below using (statement no.: Q sort value).

4.1. Perspective A: in-person instruction is more effective than online education

Factor A has an eigenvalue of 4.70 and explains 28% of the study variance with six participants significantly aligning with the factor. A primary concern of Factor A was the increased workload for current faculty (statement no. 14: Q sort value +4; Table 3). Therefore, Factor A considered that additional faculty and staff support would be required for the new program (16: +2; 19: +2). Additionally, Factor A regarded that student learning depends on level of engagement (25: +1; 31: +2; 34: +4). Overall, participants did not consider an online degree valuable for the department (1: 0; 2: −1; 5: −2; 15: +3) or the students (7: −2; 8: −3; 11: 0). Thus, Factor A did not acknowledge a current need for the program (6: −3) and were not willing to contribute to the program (24: −4). When participants from Factor A were asked to explain their Q sort, the dominant response was they felt the program would require significant work without sufficient financial return to the department. Additionally, they reiterated the belief that in-person instruction is essential to a successful education. The distinguishing statements of extreme viewpoints for Factor A with p value <0.05 are listed in Table 4.

Figure 2 shows statements that distinguish Factor A from either other factor and how those statements were ranked differently by Factors B and C. For example, Factor A, shown as the solid black line, strongly agreed that the addition of an online, non-thesis degree would increase faculty workload with minimal benefit to the faculty. Although Factors B and C somewhat agreed faculty workload would be increased, they found more personal benefit from the program. Furthermore, Factor A strongly disagreed that there is a current need for the degree in our department; however, Factors B and C both recognized a need for the program. The results of a Q methodology study by Amaruzaman et al. (2017) were also represented in this way to visualize the differences in opinions between factors.

4.2. Perspective B: online programs increase accessibility

Factor B has an eigenvalue of 2.01 and explains 12% of the overall study variance with four participants loading onto the

TABLE 3 Faculty opinions on the implementation of an online, non-thesis master's in horticulture were grouped into three factors.

	Statement	Factors		
		A	B	C
1	This degree would make our department more visible	0	1	1
2	This degree would make our department more competitive in terms of attracting students	−1	1	0
3	This degree would bring additional funding to our department	−1	−1	3
4	Without a research component, more students may be interested in studying horticulture	0	2	2
5	This degree would have a positive impact on our graduate program	−2	−1	2
6	There is a current need for this degree in our department	−3	1	2
7	Online programs produce competitive professionals	−2	0	0
8	Non-thesis programs produce competitive professionals	−3	0	−1
9	This degree would be valuable to employers	−2	1	1
10	This degree would be valuable for students	0	0	0
11	This degree would prepare students to obtain a non-research industry position	0	2	1
12	I would be willing to recommend a student from this program to an industry position	−1	3	−3
13	This degree would maintain the value of our current graduate program	−2	−2	−1
14	This degree would increase the workload of faculty members	4	1	3
15	This degree would have minimal benefit to me	3	−4	0
16	Additional faculty should be hired to teach the online classes	2	2	0
17	This degree should be a shared responsibility among all graduate faculty	−1	−3	−2
18	Only faculty with teaching appointments should assist with this degree	1	−4	−1
19	Additional staff should be hired to coordinate this degree	2	0	1
20	I would be willing to serve as a graduate advisor for students in this degree	−3	3	−3
21	Online classes would give greater flexibility in teaching	1	−1	−3
22	In the long-run, online courses would require less preparation time than face-to-face courses	−1	−3	−4
23	My teaching would be as effective online as it is face-to-face	−4	−2	−4
24	I would be willing to develop an online course if I had technical assistance	−4	−2	−1
25	Online classes require more resources to be engaging for students	1	−1	0
26	I would be willing to learn more about online delivery options	0	−2	−2
27	I would need significant training to teach an asynchronous online course	3	−3	3
28	This degree would be helpful for students with limited schedule flexibility	3	3	−2
29	This degree would allow more students to obtain a graduate degree	1	4	2
30	Students in an online program should have self-regulating study habits	1	−1	4
31	Online programs should incorporate networking opportunities for students	2	0	1
32	Students in an online program should participate in at least one in-person networking event with faculty	0	0	−1
33	This degree would help us reach non-research-oriented students	2	4	4
34	Student learning depends on level of engagement in online courses	4	2	−2

Each factor corresponded to a composite Q sort, which is a weighted average of the opinions expressed in individual Q sorts. Statements from the Q set are shown with their assigned value from the Q sort yielding the composite Q sort for Factors A, B, and C.

factor. Respondents in Factor B primarily highlight the ability of an online program to increase the accessibility of a graduate degree in horticulture, especially to non-research-oriented students (29: +4; 33: +4). Participants felt the program would be valuable for the department (2: +1) and the students (11: +2; 12: +3). Additionally, they expressed their willingness to personally support the program (12: +3; 15: −4; 20: +3). They responded that they were already comfortable teaching online classes (27: −3) but could benefit from additional training (23: −2). They did not believe all faculty should be involved in the program (17: −3), but they valued support from faculty without a teaching appointment (18: −4). Specifically, in the post-sort questions, participants identified that faculty with extension appointments would positively contribute to the program. Respondents in Factor B supported the program because they observed other successful online programs, and they reported the

TABLE 4 Statements which were ranked significantly differently ($p \leq 0.05$) by Factor A than by Factors B and C were considered distinguishing statements for Factor A.

No	Statement	Q sort value	*p*-value
Most agreed with:			
14	This degree would increase the workload of faculty members	4	$p < 0.005$
34	Student learning depends on level of engagement in online courses	4	$p < 0.01$
15	This degree would have minimal benefit to me	3	$p < 0.0001$
Least agreed with:			
6	There is a current need for this degree in our department	−3	$p < 0.0001$
24	I would be willing to develop an online course if I had technical assistance	−4	$p < 0.05$

This table gives distinguishing statements ranked |3| or |4| by Factor A.

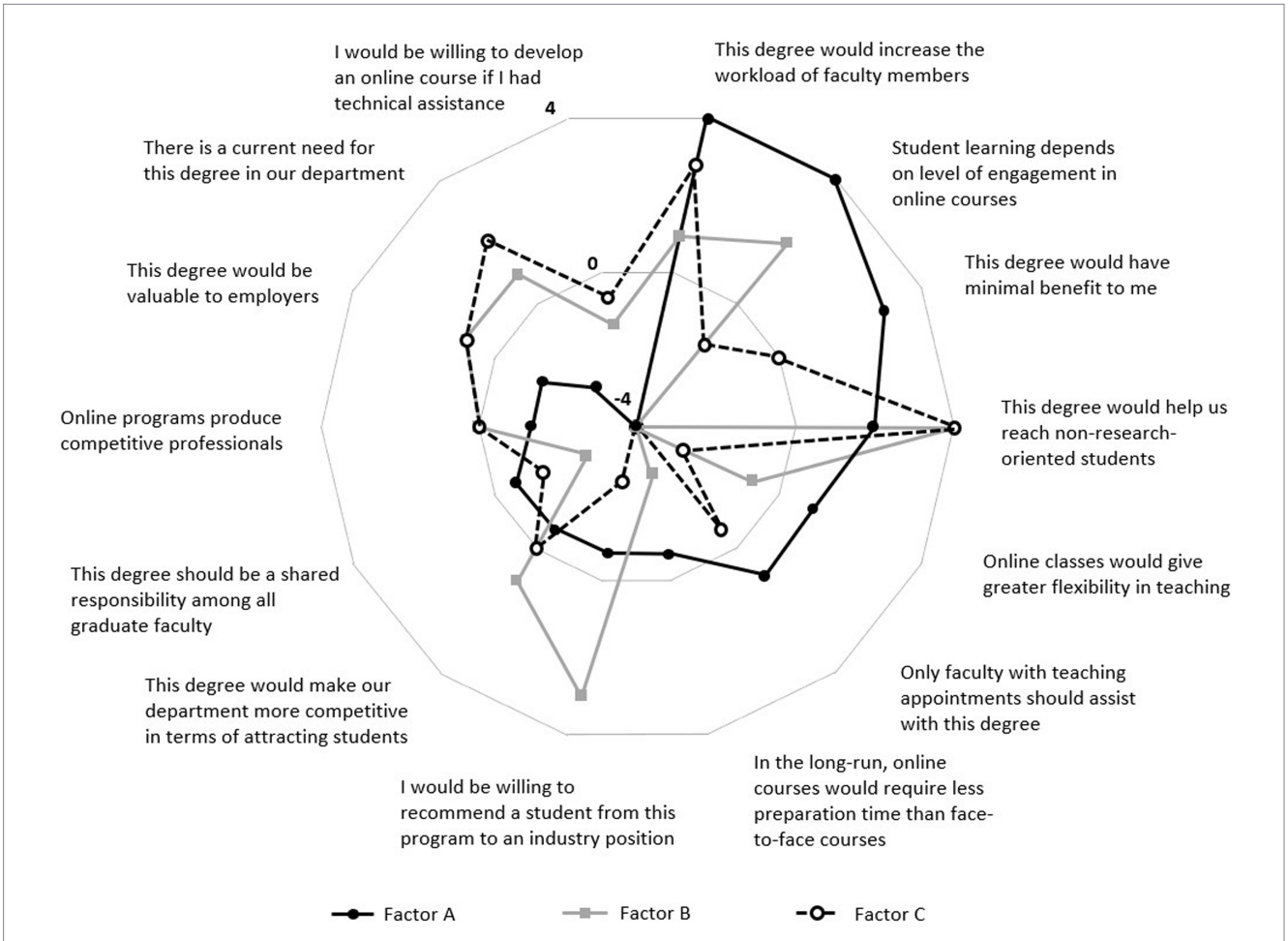

FIGURE 2
The distinguishing statements for Factor A are shown with a solid black line on the diagram. The rings represent a gradient of Q sort values from +4 on the outer ring to −4 in the center of the diagram. Each marker corresponds to a statement on the perimeter of the diagram. The solid gray line and dashed black line indicate how Factors B and C ranked the distinguishing statements from Factor A.

horticulture industry already expressed interest and support for this program. Table 5 summarizes the distinguishing statements of extreme views for Factor B with p value <0.05.

Figure 3 shows how distinguishing statements for Factor B were ranked by Factors A and C. Factor B, shown as the solid gray line, strongly agreed the degree would allow more students to obtain a graduate degree and would be willing to serve as a graduate advisor for students in the program. Although Factors A and C somewhat agreed the degree would make our graduate program more accessible to students, neither were willing to personally serve in an advisory capacity. On the other hand, Factor B strongly disagreed that they would need training to teach an asynchronous, online class; however, Factors A and C were not confident teaching online classes without significant training.

TABLE 5 Statements which were ranked significantly differently ($p \leq 0.05$) by Factor B than by Factors A and C were considered distinguishing statements for Factor B.

No	Statement	Q sort value	*p*-value
Most agreed with:			
29	This degree would allow more students to obtain a graduate degree	4	$p < 0.005$
20	I would be willing to serve as a graduate advisor for students in this degree	3	$p < 0.0001$
12	I would be willing to recommend a student from this program to an industry position	3	$p < 0.0001$
Least agreed with:			
27	I would need significant training to teach an asynchronous online course	−3	$p < 0.0001$
22	In the long-run, online courses would require less preparation time than face-to-face courses	−3	$p < 0.05$
15	This degree would have minimal benefit to me	−4	$p < 0.0001$
18	Only faculty with teaching appointments should assist with this degree	−4	$p < 0.0001$

This table gives distinguishing statements ranked |3| or |4| by Factor B.

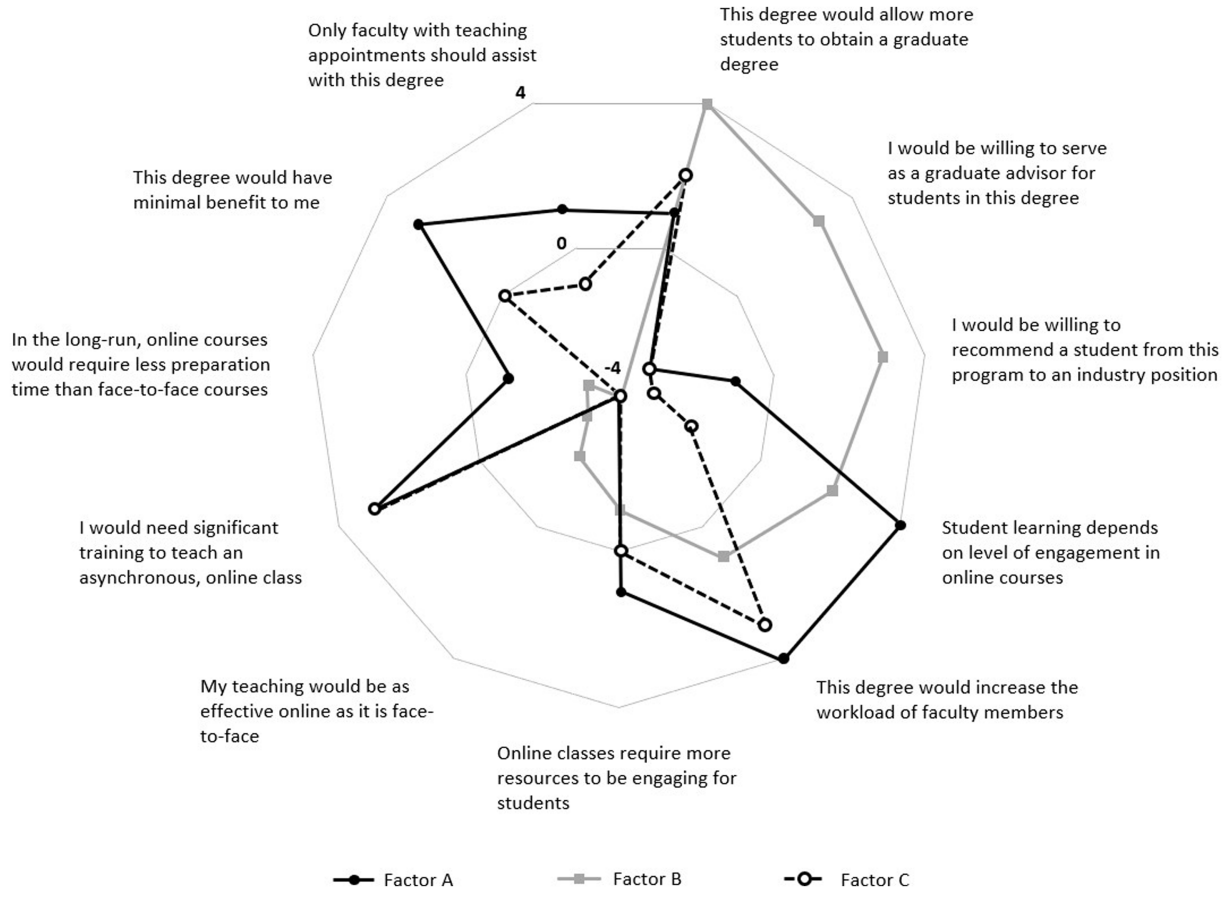

FIGURE 3
The distinguishing statements for Factor B are shown with a solid gray line on the diagram. The rings represent a gradient of Q sort values from +4 on the outer ring to −4 in the center of the diagram. Each marker corresponds to a statement on the perimeter of the diagram. The solid black line and dashed black line indicate how Factors A and C ranked the distinguishing statements from Factor B.

4.3. Perspective C: successful online programs require independent learners

Factor C is a composite of four respondents, explaining 10% of the survey variance with an eigenvalue of 1.65. Respondents in Factor C strongly believe the program would benefit non-research-oriented students (33: +4). Specifically, individuals expressed the value the program would hold for professionals in the horticulture industry who are not research-minded but want to further their education. Factor C also highlighted the importance of students being independent learners in an online program (30: +4) and placed a lesser importance on direct engagement with the students (34: −2).

TABLE 6 Statements which were ranked significantly differently ($p \leq 0.05$) by Factor C than by Factors A and B were considered distinguishing statements for Factor C.

No	Statement	Q sort value	*p*-value
Most agreed with:			
30	Students in an online program should have self-regulating study habits	4	$p < 0.0001$
3	This degree would bring additional funding to our department	3	$p < 0.0001$
14	This degree would increase the workload of faculty members	3	$p < 0.05$
Least agreed with:			
12	I would be willing to recommend a student from this program to an industry position	−3	$p < 0.005$
22	In the long-run, online courses would require less preparation time than face-to-face courses	−4	$p < 0.01$

This table gives distinguishing statements ranked |3| or |4| by Factor C.

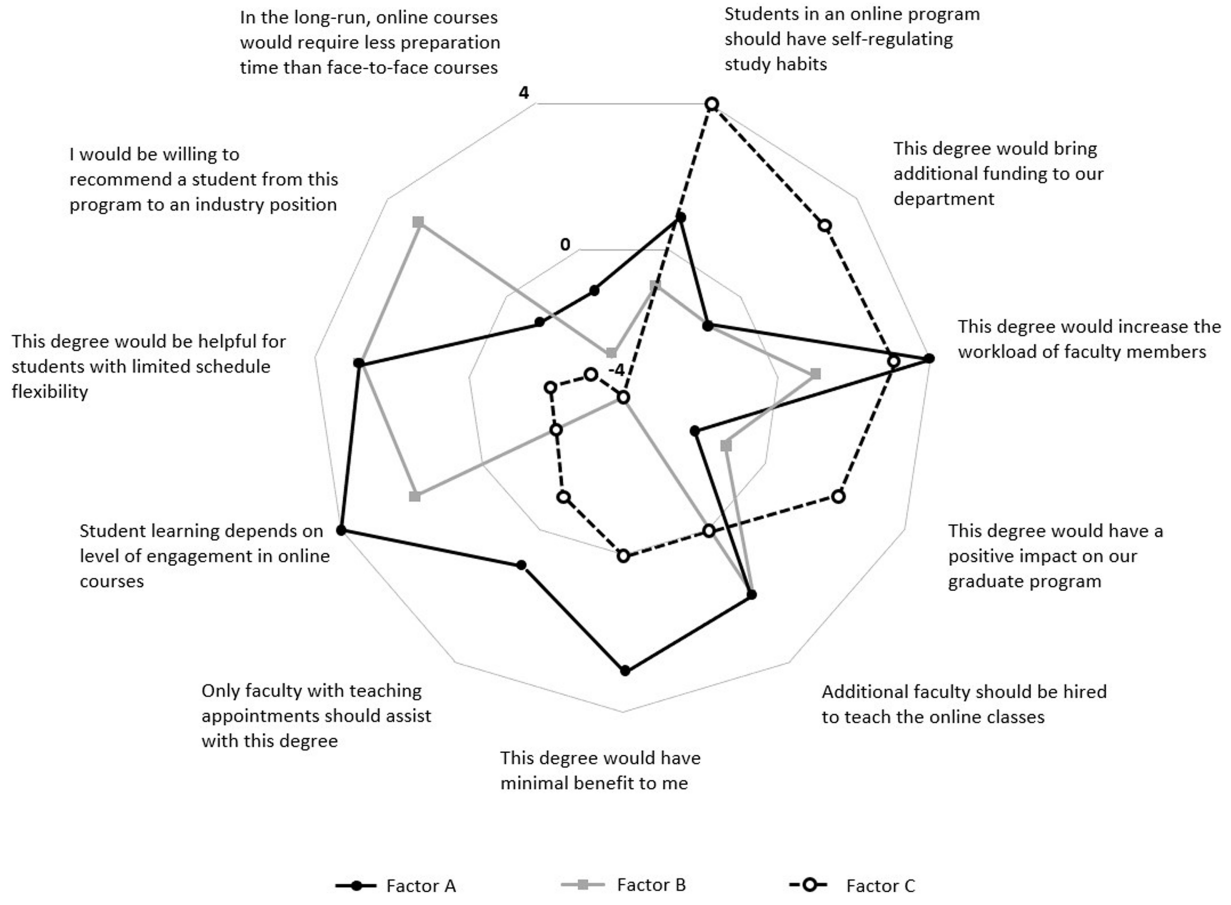

FIGURE 4
The distinguishing statements for Factor C are shown with a dashed black line on the diagram. The rings represent a gradient of Q sort values from +4 on the outer ring to −4 in the center of the diagram. Each marker corresponds to a statement on the perimeter of the diagram. The solid black line and the solid gray line indicate how Factors A and B ranked the distinguishing statements from Factor C.

Respondents in Factor C also believed the program would add value to the department (3: +3; 5: +2; 6: +2). A primary concern of Factor C was that although online classes would give flexibility to the student, it would increase the workload of faculty (14: +3; 21: −3; 22: −4). Finally, respondents noted the importance of appropriate training for faculty to be effective instructors online (23: −4; 27: +3). The distinguishing statements for extreme views of Factor C are summarized in Table 6.

Figure 4 shows how distinguishing statements for Factor C were ranked by Factors A and B. It was the perspective of Factor C, shown as the dashed black line, that students in online program need self-regulating study habits. However, Factors A and B did not agree as strongly with this statement. Factor C also strongly disagreed that student learning depends on level of engagement in online classes. In contrast, Factors A and B strongly agreed that the learning process requires students to engage in online classes.

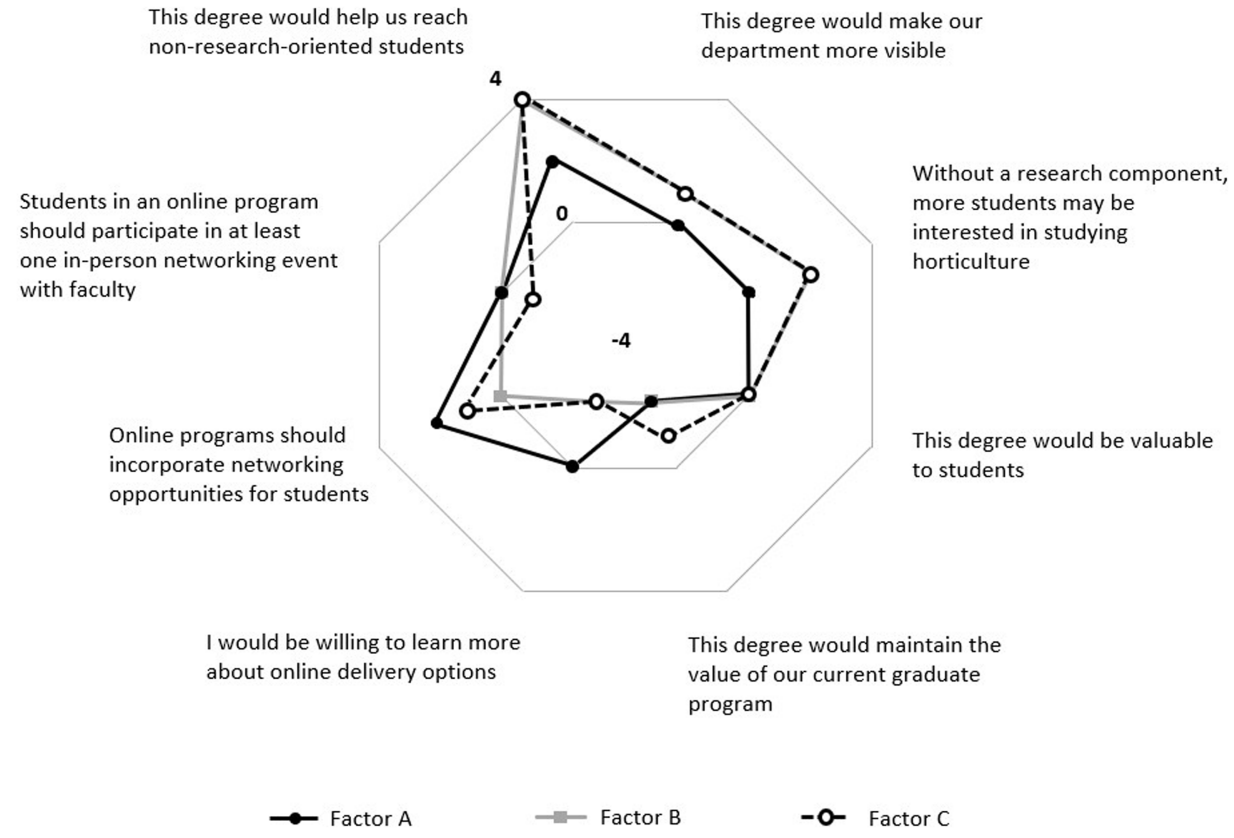

FIGURE 5
This diagram shows the consensus statements among Factors A, B, and C using a solid black line, solid gray line, and dashed black line, respectively. The rings represent a gradient of Q sort values from +4 on the outer ring to −4 in the center of the diagram. Each marker corresponds to a statement on the perimeter of the diagram.

4.4. Consensus statements among factors

This study also identified eight statements that were not significantly divergent among the three factors (Figure 5). The responses to most of these statements were neutral, indicating they were not primary concerns for any factor. The most notable consensus is a strong agreement among all factors that the online degree would allow us to reach non-research-oriented students (33: 2/4/4), which is the primary objective of the program. Additionally, Factors A, B, and C agreed or responded neutrally that an online master's degree would make the department more visible (1: 0/1/1) and generate new interest in horticulture (4: 0/2/2). However, all three factors were neutral that the online degree would be valuable to students (10: 0/0/0) and did not agree that it would maintain the value of the current degree program (13: −2/−2/−1). Faculty also shared an unwillingness to learn more about online education (26: 0/−2/−2). Finally, each factor agreed that students should have networking opportunities (31: 2/0/1) but not necessarily involving faculty (32: 0/0/−1).

5. Discussion

Although the opinions expressed in this survey fell into three distinct factors, some perspectives were shared between two or more factors including faculty workload, effectiveness of teaching, and importance of student engagement. The primary objective of this research was to identify why there is a discrepancy between the educational need of graduate students entering the workforce and available educational opportunities. Since faculty play a critical role in the growth of online programs, our research attempted to identify the reason for faculty support of or disagreement with an online master's degree. One consensus statement among all factors indicated faculty strongly believed an online degree would help our department reach non-research-oriented students. Therefore, we could improve educational opportunities for graduate students by offering an online degree if we can increase the willingness of faculty to support the program and equip them to be successful online educators.

A primary concern of Factors A and C was the potential for increased faculty workload. As seen in the consensus statements, all factors also shared an unwillingness to learn more about online programs, which is presumably related to their concern for additional work. Increased workload is a common deterrent for faculty considering online course offerings, particularly for those who are unfamiliar with online education (Thompson, 2004; Mandernach et al., 2013). Some useful strategies that faculty have found to efficiently manage time in online classes include automated grading for close-ended questions, use of general assignment comments for repetitive feedback, and using direct notifications to regularly communicate with the class to minimize student confusion (Cooper et al., 2019). However, the time invested in creating a new online course is a significant barrier for faculty to teach

online (Kellen and Kumar, 2021). Because preparation for online teaching is time consuming, training and technical support are important for faculty who are new to online teaching (Elshami et al., 2021) Additionally, faculty satisfaction with online teaching is higher when they receive incentives (Marasi et al., 2020). Therefore, if faculty receive adequate technical support and incentives for establishing a new course, they may be less apprehensive about teaching online.

All three factors indicated faculty were concerned their teaching would be less effective in an online format and held concern about the value of an online program compared to the existing face-to face master's. Both are common concerns for university educators (Kellen and Kumar, 2021). Martin et al. (2019) studied faculty perception of their online teaching ability and found that faculty have high confidence in their ability to create assignments for online courses but have less confidence in creating instructional videos. For course communication, faculty have confidence in their ability to respond to student emails but less confidence in their ability to make materials accessible for different student needs (Martin et al., 2019). Confidence in effective online instruction is likely tied to the perceived value of online programs. There has been a consistent trend of faculty being unwilling to accept the legitimacy of online programs, but there is a significant correlation between acceptance of online programs and student enrollment in online courses (Elaine et al., 2016). Although the present study did not investigate the reasons faculty lacked confidence in the effectiveness of their teaching and did not value online programs, future research could investigate specific ways to support faculty to improve their readiness for online instruction.

Each factor was based on faculty experiences and instructional preferences making the needs of each factor different. Faculty in Factor A, who value in-person instruction over online education, are not willing to teach online and do not currently value online education. Therefore, Factor A would benefit from seeing other successful online programs to give them more confidence in supporting a new online master's degree. Faculty in Factor B, who believe online programs increase accessibility, have previous experience teaching online and are willing to support the online program. Therefore, it would be essential to involve faculty who fall in Factor B in the development and implementation of a new online master's. Finally, faculty in Factor C, who believe successful online programs require independent learners, see the value of an online degree for the learners but need support in creating an online classroom that promotes independent learning.

6. Conclusion

The results of this research study highlight three distinct perspectives about the addition of an online, non-thesis master's program. These were: (A) in-person instruction is more effective than online education, (B) online programs increase accessibility, and (C) successful online programs require independent learners. The primary concerns for this program came from Factor A who are supporters of in-person instruction. Factor A was reluctant to support the online program because they strongly believed the degree would increase the workload of faculty and not provide significant benefit to prospective students or the department. However, both Factors B and C indicated support for the program. Individuals loading on Factor B believed the primary benefit of the online program would be increasing accessibility of higher education to non-research-oriented students. Factor C also recognized the benefits of this program for students but placed a higher emphasis on independent learning than Factor B. By recognizing the differences in perspectives and needs of faculty in each factor, the department is better equipped to overcome potential challenges in the implementation of a new online master's degree. Overall, a successful program would require the participation of willing faculty who are provided the necessary resources and pedagogical training to be effective online educators.

Although previous studies investigated student and faculty perspectives of online instruction, our research provides new insight on factors that influence faculty support of online master's programs. Q methodology, which was selected for this research, is a well-established mixed methods tool to study subjective opinions. It has commonly been used in education research but has not been extensively used to study the opinion of faculty in higher education. To our knowledge, this is the first application of Q methodology to gauge faculty opinions for informing departmental decisions. Although faculty participating in this study were from the field of horticulture, the context of the study was not discipline-specific. Therefore, the methodology and presented findings are applicable to many other disciplines. Specifically, Q methodology can be used as a survey tool to better prepare departments to implement new programs by identifying what resources are needed to equip their faculty to be successful educators.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by the University of Georgia Institutional Review Board. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin because the institutional review board deemed the study was not "research involving human subjects as defined by DHHS and FDA regulations." Specifically, the study was completely anonymous and no identifiable information was collected from the participants.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Acknowledgments

We would like to thank Dr. Lloyd Rieber from the Department of Workforce Education and Instructional Technology at the University of Georgia for his intellectual contributions to the article as well as his guidance on Q methodology.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2023.1252353/full#supplementary-material

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