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Forming Optimal Classroom Environments Through Bandura's Mastery Experiences: An Andragogy Model

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Abstract. Higher education faculty members are increasingly being asked to defend their teaching methods with research-based support. This article offers such evidence through a randomized control-group pretest-posttest study that examined whether a newly created andragogy method, Forming Optimal Classroom Environments (FOCE), increased master's students' research self-efficacy in comparison to the standard teaching method (STM). The article details the model, based on Bandura's social cognitive theory, particularly his concept of self-efficacy. The model relies upon both Bandura's publications and results over the last 40 years from researchers who have investigated higher education teaching techniques based on the concept of self-efficacy. Fifteen such research-based techniques form the model. Results found no significant interaction effect when comparing FOCE with the STM. Additionally, both teaching methods demonstrated that knowledge increases were positively correlated with research self-efficacy increases. This result indicates that increasing research knowledge is one factor in increasing students' research self-efficacy.

Keywords: research self-efficacy, experimental design, andragogy, teaching method

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In the preparation of practitioner master's students, most fields, including counseling, expect educators to ground their work within "theoretical and pedagogical foundations" (American Counseling Association [ACA], 2014, p 13). This study aims to assist educators with fulfilling expectations through an andragogy model, Forming Optimal Classroom Environments (FOCE), which is based on Bandura's social cognitive theory (SCT). Researchers have thus used self-efficacy, one aspect of SCT, to investigate andragogy practices (e.g., Lamprecht & Pitre, 2018; Sawyer et al., 2013; Wester et al., 2019), including Tiyuri et al. (2018) who found that increasing self-efficacy improved students' academic performance and Cheng et al. (2019) who reported a relationship between self-efficacy and students' academic hardiness. Additionally, Larson and Daniels (1998) conducted a review of counseling psychology articles published starting in 1983 that included self-efficacy. They reported that one common use of self-efficacy was within supervision (e.g., Stark & Greggerson, 2016; Swank & McCarthy, 2015), with Larson (1998) creating a model. Another common application has been students' research self-efficacy (e.g., Borders, 2017; Holden et al., 1999; Lambie & Vaccaro, 2011), including a doctorate-level training model (Gelso, 2006), which has been empirically supported (e.g., Gelso et al., 2013; Kahn & Scott, 1997; Phillips & Russell, 1994).

The present study tested the novel andragogy model FOCE on master's students taking their one required research methods class. Research identity development, and thus research self-efficacy, was the focus for this study, because it has presented complex challenges for counseling educators. For instance, the 2016 Council for Accreditation of Counseling and Related Educational Programs (CACREP) standards state that programs teach students the "importance of research in advancing the counseling profession including how to critique research to inform counseling practice" (2015, p. 12). In contrast, scholars for over two decades have found that individuals attracted to the helping fields tend to lack confidence or even interest in research (Gelso et al., 2013; Kahn & Scott, 1997; Lambie & Vaccaro, 2011; Phillips & Russell, 1994; Steele & Rawls, 2015). Consequently, a gap exists between educational standards and the research-based skills with which students graduate (Sink & Lemich, 2018).

By testing FOCE through a pretest-posttest experimental design, this pilot study aims to examine the effectiveness of FOCE in comparison to the standard teaching model (STM) and to learn more about master's students' research identity development. This article will note SCT as it relates to self-efficacy along with how Bandura's models informed FOCE, detail the FOCE model, present the current study including results and discussion, and then examine implications for educators.

Social Cognitive Theory

Bandura's publication of Social Cognitive Theory (SCT) expanded upon his seminal article regarding self-efficacy (1977), describing it as "the strength of people's convictions in their own effectiveness" (p. 193). He argued, "Efficacy expectations determine how much effort people will expend and how long they will persist in the face of obstacles and aversive experiences" (p. 194). He also reported his discovery that four elements could be used to increase participants' self-efficacy in relation to completing a chosen task: 1) mastery experiences, 2) vicarious experiences, 3) verbal persuasion, and 4) physiological responses. Out of the four, he depicted mastery experiences (occasionally termed positive self-instructed performances) as being particularly influential. The term mastery experiences delimitated any outcome performed by participants where they successfully completed the task. When participants demonstrated a mastery experience, their confidence in completing the task increased, thus increasing self-efficacy.

Vicarious experiences aided in gaining mastery experiences and increasing confidence. Bandura (1977) defined vicarious experiences as any observation of others having mastery experiences or being told by others of their mastery experiences. In the classroom, vicarious experiences could also be described as modeling, both by the teachers and through more confident student peers. Bandura (1977) noted that vicarious experiences were less likely to endure and lead to increased confidence than mastery experiences. Examples include verbal persuasion, which could be suggestions, exhortations, self-instructions, and interpretive treatments. In a classroom, these and other types of verbal persuasion could be enacted by the teacher to the class, as well as to individuals, by peers to one another, and students individually as they repeat to themselves the teacher's or peers' verbal persuasions. Bandura (1977) described the fourth element, physiological responses, as any emotional responses that manifest in the body in reaction to task stimuli that interfere with task completion (e.g., anxiety), and thus can impact self-efficacy indirectly. Thus, paying attention to physiological responses was important because high arousal, for instance high anxiety, usually debilitated performance (Bandura, 1977).

Forming Optimal Classroom Environments Model

The novel model tested in this pilot study, Forming Optimal Classroom Environments Model (FOCE), intertwines three components: 1) increasing self-efficacy (Bandura, 1977), 2) classroom intervention research resulting in self-efficacy increases (i.e., Abaho et al., 2015; Dahlman, 2010; Epstein, 1987; McConnell, 2014; Montcalm, 1999; Susskind, 2005; Unrau & Grinnell, 2005; Wang, 2011; Yavorsky, 2017), 3) previous development models based on self-efficacy (i.e., Gelso, 2006; Larson, 1998). Thus, FOCE is a collection of previously empirically supported classroom techniques found to increase self-efficacy plus

findings from previous self-efficacy models placed within Bandura's framework woven into something that uniquely keeps current educators and standards in mind. The following sections, based on Bandura's (1977) four elements, offer increased detail of the model. Each section will offer a brief explanation into how the element applies in the classroom and then associated researched techniques. There are 11 approaches along with four supports, which totals 15 techniques.

Physiological Responses

Bandura (1977) stated, "because high arousal usually debilitates performance, individuals are more likely to expect success when they are not beset by aversive arousal" (p. 198). Thus, altering physiological responses to reduce high arousal, i.e., anxiety, is critical, so that students' fears do not impede their learning. Yet, actualizing it contains inherent complexities (McConnell, 2014).

One approach is to create a space sufficiently welcoming where students will share their heightened physiological responses (Montcalm, 1999). The instructor creates a classroom environment where students are simultaneously supported in their autonomy and encouraged to have a sense of belonging through inclusive activities (Yavorsky, 2017) along with the technique of humor (Epstein, 1987). An example of humor would be offering instances of when research had gone awry. Ideally, this specific use of humor would not only reduce heightened physiological responses, but also assist in building a willingness to collaborate with fellow classmates. However, humor can be tricky and possibly offensive. Thus, carefully crafted examples would need to keep in mind diversity and inclusion issues.

Another approach is normalization. Pre-test scores that captured students' knowledge of the class' topics could aid this enactment. Also, during the first class meeting, questions about students' physiological responses related to being in the class would be asked anonymously. Instructors share these formal and informal collections with students to showcase that their feelings are normal. Further normalizations can be the instructor outlining pivotal events, describing their early misconceptions, and detailing their struggles, "anxiety, self-doubt, and questioning" (McConnell, 2014, p. 75).

The third approach is demystification. For instance, the teacher would lead the class in a discussion regarding students' passion and then link that passion with the topics to be covered (McConnell, 2014). Personalizing the topics, connecting them to the students' passion, and having terms be relatable is all intended to decrease heightened psychological responses and give students a non-threatening and perhaps, even, inviting lens.

Verbal Persuasion

Bandura (1977) stated that social persuasion increases individuals' capacity to master difficult situations, as it often encourages them to attempt something that

they might not have otherwise. Thus, according to Bandura, social persuasion works best when the individual believes the person presenting the persuasion along with the presence of positive reinforcement. In the classroom verbal persuasion can be seen as a type of positive social persuasion (Wang, 2011). As an example, the instructor could self-disclose confusions and/or struggles followed by encouragement that the students too could have mastery experiences.

The primary approach to perform verbal persuasion is positive reinforcement. Some examples would be giving students positive feedback when they have completed an assignment or even when they are in the process of completion or stating specific praises to students in regard to their improvements as they engage in activities. This technique would include giving students a multitude of individual verbal encouragers and offering the whole class well-placed and honest verbal encouragement. This approach could also include any form of communication that contains opportunities of verbal persuasion, for instance, PowerPoint or another form of visual guide (Susskind, 2005).

Vicarious Experiences

Bandura (1977) described the importance of having different kinds of vicarious experiences. In the classroom this would be termed modeling and would include both peer-to-peer modeling and teacher-to-student modeling. For peer-to-peer modeling, the purpose would be to see others' performance without adverse consequences. This can then "generate expectations in observers that they too will improve if they intensify and persist in their efforts. They persuade themselves that if others can do it, they should be able to achieve at least some improvement in performance" (p. 197).

One approach is small groups purposefully containing students with a varying pre-existing knowledge of the topic. Results from a knowledge questionnaire could form these groups. Each grouping would consist of a student that scored higher with a student that scored lower. For this approach to be optimally effective, the lower-scoring student would need a close-enough model from whom they can gain confidence. This study's questionnaire had 14 questions. An approximately five-point spread between the individuals was employed with any necessary group of three having the third individual's score be near the mean of the highest and lowest scores. In this way, as the course progresses, the lower-scoring student would be able to observe the higher scoring student's engagement, and the higher scoring student would have the opportunity to demonstrate competence to the lower-scoring student. Optimally these interactions would aid in creating an environment where cooperative learning would flourish (Dahlman, 2010).

The other approach, teacher-student modeling, requires that instructors demonstrate themselves to be knowledgeable in the topic and thus convince students that they are a worthy model (Abaho et al., 2015). Doing so would also

strengthen the verbal persuasion enactments. Instructors describing to students their condensed history of engaging with research could enact this. However, it is particularly helpful for instructors to present themselves as being reluctant researchers and focus on their struggles to connect with research and research literature (McConnell, 2014). This balance would aid in preventing the teacher from becoming a model too far removed from the students, and thus undermining the modeling influence.

Mastery Experiences

According to Bandura (1977) the previous three elements (physiological responses, verbal persuasion, and vicarious experiences) are necessary to generate optimal conditions for mastery experiences. In the classroom, the previous techniques would combine with the ones following to form the conditions for students to experience success in mastering the material. Thus, the following techniques assume that the previous three elements are present.

One approach is participatory learning (Abaho et al., 2015), which includes completing a task (Bandura, 1977). The second approach encourages students to hone their confidence in basic skills by engaging them with the material without penalty (Dahlman, 2010). As such, it is valuable to build assignments incrementally and to relate the assigned projects closely to the profession (Montcalm, 1999). Additionally, the assigned work should align with students' skill levels (Unrau & Grinnell, 2005). Scores from a knowledge questionnaire could aid this approach by giving the instructor insight into the students' knowledge prior to the semester start.

The Current Study

This pilot study examined the effectiveness of the Forming Optimal Classroom Environments (FOCE) model in comparison with the Standard Teaching Model (STM) using a randomized pretest-posttest experimental design. Enrolled master's students were randomly assigned to one of two sections of a social science research methods graduate course. Student research self-efficacy and research knowledge were assessed at the start and end of the course. Instructor fidelity was assessed, as model fidelity can impact intervention outcome (DiGennaro & Codding, 2014). Additionally, according to Sherer et al. (1982), individual differences in past experiences and how successful a skill was acquired can impact the scores of generalized self-efficacy. Thus, the possible confounding variable 'exposure to research' was captured through a pre-test questionnaire. Three hypotheses were tested:

H1: Participants who receive the FOCE model will have greater increases in research self-efficacy than will students who receive the STM.

H2: Participants who receive the FOCE model will have greater increases in research knowledge than will students who receive the STM.

H3: Post-test research knowledge and research self-efficacy will be positively correlated.

Method

A pretest-posttest experimental design was used to assess the degree to which participants receiving the FOCE model made gains in their research knowledge and research self-efficacy as compared to those who received the STM.

Participants

The sample consisted of master's students at an American southeastern urban university who had enrolled in a social science research methods course taught within the College of Education. Students had the ability to alter the section in which they had been randomly assigned, but no student enacted this option. The FOCE section started with 17 enrolled students; the STM section started with 16 students. Participants were eliminated from the sample for the following reasons: One student who filled out the pre-test in each section dropped the course, and thus was not included in the post-test. Two students in the STM section were eliminated due to incomplete data. One student in STM section elected to withdraw from the study. This left a final sample of 16 students in the FOCE model section and 12 students in the STM section.

Participants placed in the FOCE section identified slightly more as male (n = 9) than female (n = 7), were 21-40 years of age (M = 24.31, SD = 4.44), and had completed 0-80% (M = 27.44, SD = 29.92) of their degree. Those placed in the STM section identified more as female (n = 11) than male (n = 1), were 21-40 years of age (M = 24.25, SD = 5.05), and had completed 0-70% of their degree (M = 24.83, SD = 31.22). No participants identified their gender other than male or female. For information on the degrees participants were pursuing and their race and ethnicity see Table 1.

Table 1
Demographics: Degree Pursuing and Race/Ethnicity

Degree Pursuing	FOCE *n (%)*	STM *N (%)*	Race/Ethnicity	FOCE *n (%)*	STM *n (%)*
Education Leadership	6 (37.5%)	5 (41.67%)	Non-Hispanic African American or Black	3 (18.75%)	2 (16.7%)
Counseling	6 (37.5%)	6 (50%)	Hispanic African-American		2 (16.7%)
Sports Management	3 (18.75%)	1 (8.33%)	Non-Hispanic Asian	1 (6.25%)	2 (16.7%)
Linguistics	1 (6.25%)		Mixed Race	1 (6.25%)	1 (8.3%)
			Hispanic White		1 (8.3%)
			Non-Hispanic White or Caucasian	11 (68.75%)	4 (33.3%)

Procedures

All relevant ACA Ethical Codes regarding research were adhered to (ACA, 2014). Following Internal Review Board (IRB) approval, one of the two instructors, henceforth labeled the FOCE instructor received a manual before the start of the course. This manual detailed the FOCE model and gave instructions for classroom implementation. In order to reduce fidelity errors, a week later the author verified the FOCE instructor's understanding of how to implement the FOCE model. Additionally, the author gave the FOCE instructor the students' knowledge scores along with recommended group placements. The other instructor, who did not receive the FOCE manual, and thus taught the STM, is henceforth labeled the STM instructor.

The four different measures collected were: 1) observations of instructor fidelity, 2) author created exposure to research questionnaire, 3) author created students' knowledge questionnaire, and 4) the Research Self-Efficacy Scale (RSE; Holden et al., 1999).

Measures

Observations of Instructor Fidelity

Both instructors were observed three weeks into the15-week semester and then three weeks before the semester's end. Observations were recorded onto a table that contained all interventions and techniques (15 in total) found in the manual along with the column 'observed' and second column to mark the time when observed. An example very similar to the one used can be found in Table 2.

Exposure to Research Questionnaire

This questionnaire, created for the purpose of this study, inquired upon respondents past experiences with participating in and conducting empirical research as well as their exposure and comfort with research literatures. It consisted of five questions that initially required a "Yes" or "No" answer 1) "Before this class have you taken a research-related course?", 2) "Have you ever worked on a research project intended for publication?", 3) "Have you ever worked on any research project (could even be prior to college) not intended for publication?**",** 4) "Have you ever needed to access published works regarding research and its results for a project?", and 5) "If you've read a published journal article, what parts did you read (pick all that apply, including roles on multiple projects)?". When a "Yes" was given, subsequent questions followed. For instance, the subsequent question to the first question was "How many?" or for the second question, two subsequent questions were asked "How many months" and then "What role/jobs did you do (pick all that apply, including roles on multiple projects)" which was a multiple option question. Answers were "Code Data," "Clean Data," "Transcribe," "Search the literature for articles related to project," "Enter Data," or "Other" with a place for them to write in what that might be. Any response of a "Yes" received one point, whereas "No" received a zero. If a respondent answered yes, and thus answered a sub question, the scoring depended on if it related to time (each month received one point) or selected from multiple possible options (each option selected received one point). The lowest limit of the scores was zero, indicating no prior experience with research. There was no set upper limit, given the scoring included time; the highest recorded score for the sample was 57. Appendix A has a blank questionnaire.

Since the author created the questionnaire for the study, it was tested prior to the study. The semester before the study was conducted students enrolled in the study's course were asked to answer the questionnaire along with offering their feedback. All acquired information was considered and confusing wording improved.

Knowledge Questionnaire

This questionnaire was developed for the purpose of this study. Fourteen open-ended questions measured student mastery of the course learning objectives. For instance, two questions were "Define a hypothesis" and "Describe the importance of reliability for a measurement instrument." Each of the 14 questions was scored with one point, giving the questionnaire a possible score range of 0 to 14, with higher scores indicating greater mastery of the course material. Given the qualitative nature of the answers, interrater reliability was used to determine consistency in scoring. Initially, both the author and a reviewer scored the knowledge pretest. Interrater agreement was 71.43%. As this was less than 80%, reasons for non-agreement were discussed. It was discovered that the reviewer was scoring more literally to the answer key than the author. A conversation about whether the

answers should reflect an exact match or a match to the concept resulted that the scoring should reflect the participants' demonstrated understanding of the concept. Answers were rescored and a 92.86% interrater agreement was achieved for the pretest. This method of scoring was then used for the posttest. The posttest interrater agreement was 93.88%. Appendix B has a blank questionnaire.

Since the author created the questionnaire for the study, it was piloted on students enrolled in the study's course, but a semester prior to when the study was conducted. Students were asked to answer the questions along with offering their feedback. All feedback was considered, and confusing wording improved.

Research Self-Efficacy Scale

The RSE scale (Holden, 1999) consisted of nine Likert-scale questions that range from "I cannot do at all" with a score of 0 to "I am certain can do" with a score of 100, with higher scores indicating higher self-efficacy. Two examples of items included in RSE are "Please rate your level of confidence in your ability to do effective electronic database searching of scholarly literature" and "Please rate your level of confidence in your ability to formulate a clear research question or testable hypothesis." The original evaluation of RSE reported that the data results supported its construct validity (Holden et al., 1999). RSE has been previously used to capture research self-efficacy with social workers (e.g., Macke & Tapp, 2012; Unrau & Beck, 2004) and PhD students (e.g., Borders, 2017; Lambie & Vaccaro, 2011), but was untested for the study's sample of master's students. The study's sample yielded a strong internal reliability (α = .93; *N = 28*). This is comparable to the results reported in Holden et al. (1999; α = .94).

Data Analyses

Analysis of variance (ANOVA) with repeated measures compared score changes between FOCE and STM based upon knowledge and RSE pre and post-tests. Prior to running the analysis, the assumption of homogeneity was explored in a multitude of ways. First, the items were examined for their parametric properties. Specifically, kurtosis (ranged between -1.34 and .75) and skewness (ranged between -1.00 and .74) values were scrutinized, along with item distribution graphs, P-P and Q-Q plots, and by the Kolmogorov-Smirnov (K-S) test. No outliers were found. In conclusion, the analyses examining the parametric properties of the demographic variables showed they overall suggested a normal distribution. Furthermore, homogeneity analyses (e.g., plots and K-S test) largely reflected normality in the scores.

Results

Model Fidelity

During the first observation of the STM instructor, 11 of the 15 techniques were observed, resulting in a 73% fidelity rate. Most notably present were "Students appear to have a sense of belonging," "demystifying research," and "teacher describing mastery experiences" (see Table 2). In the second observation, nine of the 15 techniques were observed, which is a 60% fidelity rate. Observations that had not been present prior included "teach at students' level," "engage in material without penalty," and "examples of normalization" (see Table 2)

For the first observation of the FOCE instructor, eight of the 15 techniques were observed, which resulted in a 53% fidelity rate. Most notably missing were peer to peer vicarious experiences. Furthermore, practicing a task was absent (see Table 2). During the second observation a total of nine out of the 15 techniques were observed. This resulted in an increase in the fidelity rate from 53% to 60%. Once more the most notable element lacking was peer to peer vicarious experiences. Also, not observed were instances when students spoke about fears or concerns regarding research (see Table 2).

The class objectives, required texts, course description, and assignments were also examined to determine if they contained any of the elements of the model. Three of the model's techniques were determined to be present through the assignments (see Table 2). For instance, the syllabus contained "Students practicing a task" through applied exercises (10 assignments that in total were 50% of the grade) where each one contained low stakes at 5% of the grade. Combined, by the end of the semester, the FOCE teacher's fidelity rate to the model was 67% (10 out of the 15 techniques). Thus, overall, a moderate level of fidelity to prescribed treatment was observed.

When the instructors were compared for similarities seven of the 15 techniques (47%) were noted. These were four out of the five techniques associated with mastery experiences, one related to vicarious experiences ("Teacher describing mastery experience"), one related to verbal persuasion ("PowerPoints"), and one related to physiological responses ("Demystifying research"). Thus, overall, a moderate level of fidelity to prescribed treatment was observed, and a low-moderate level of similarity between the groups was noted (47%).

Table 2

Observations of Andragogy

	1st Observation		2nd Observation		S
	STM	FOCE	STM	FOCE	
Mastery Experiences					
Students practicing a task				X	X
Engage in material without penalty	X		X	X	X
Incremental assignments	X		X		X
Teach at students' level	X	X	X	X	
Participatory learning	X	X		X	
Vicarious Experiences					
Teacher describing mastery experience	X	X	X	X	
Watching peer have a mastery experience					
Verbal Persuasion					
Offering students positive feedback	X		X		
Verbal encouragers	X		X		
PowerPoints	X	X	X	X	
Physiological Responses					
Students' autonomy appears supported		X		X	
Students appear to have a sense of belonging	X	X		X	
Students can speak about fear/concerns	X	X			
Examples of normalization	X		X		
Demystifying research	X	X	X	X	

STM=Standard Teaching Method; FOCE=Intervention Group; S=Present in Syllabus

Potential Confounding Influences

Two *t*-tests examined whether the possible confounding variable 'exposure to research' was present. Pre-test history scores were compared between the two groups. *T*-test results suggested that the two groups had no significant differences at pre-test related to history scores, $t[26] = -1.69$, $p = .103$, $d = .65$, with the STM section generating a numerically but not significantly higher mean ($M = 28.25$, $SD = 13.75$) than the FOCE section ($M = 20.25$, $SD = 11.30$).

Model's Effectiveness

The ANOVA with repeated measure results showed that participants' knowledge scores significantly increased over time, $F(1,26) = 34.82$, $p < .001$, $\eta^2 = .57$. Additionally, the results showed that RSE scores significantly increased over time, $F(1,26) = 12.11$, $p = .002$, $\eta^2 = .32$. The time by treatment interaction was nonsignificant for both knowledge ($F(1,26) = 2.70$, $p = .112$, $\eta^2 = .09$) and RSE ($F(1,26) = .83$, $p = .372$, $\eta^2 = .03$).

Learning Outcomes

In both conditions knowledge and RSE scores increased significantly between pre-test and post-test (see Table 3). When the relationship between pre-test knowledge and RSE scores ($N = 28$) was examined, their correlation was $r(27) = .613$, $p < .01$, which is a moderately high correlation, accounting for 37.58% of the variance. The correlation between post-test knowledge scores and RSE scores ($N = 28$) was $r(27) = .424$, $p < .05$, accounting for 17.98% of the variance.

Table 3

Sample's Mean and Standard Deviation for FOCE and STM

RSE	FOCE		STM		**Knowledge**	FOCE		STM	
	M	*SD*	*M*	*SD*		*M*	*SD*	*M*	*SD*
Pre-test	560	173	590	167	Pre-test	11.6	4.3	13.8	3.7
Post-test	689	150	666	153	Post-test	16.7	3.9	16.7	3.9

To summarize, the STM teacher had a 73% fidelity rate at first observation and a 60% rate at second observation. The FOCE instructor had a 53% fidelity rate at first observation and a 67% fidelity rate at second observation. Additionally, the instructors were noted to have both employed 47% of the FOCE techniques. The pre-test history *t*-test results implied that the sections were non-significantly different at the start of the semester in regard to 'exposure to research.' Both knowledge scores and RSE scores significantly increased over time, with no interaction effect between FOCE and STM for either measure. Correlations between

knowledge and RSE pre-test and post-test scores accounted for 37.58% of the variance at pre-test and 17.98% of the variance at post-test.

Discussion

Research identity development speaks to the two hallmarks of practitioner education expectations: knowledge acquisition and skillful application. For example, Jorgensen and Duncan (2015) found that how student counselors interpreted information and internalized it was most salient, although the learning environment and external messages were important. Self-efficacy, at its most basic definition, is the confidence to complete a task or tasks (Bandura, 1977), making it a valuable tool for educators to measure meeting expectations. FOCE is a novel evidence-based model predicated on Bandura's (1977) theory of self-efficacy intended to meet educators' needs. This study aimed to evaluate FOCE. The following sections will discuss the results.

Interaction Effect

RSE's high Cronbach alpha results suggest the instrument has a robust internal consistency for the sample. RSE and knowledge scores increased significantly in both the FOCE class and STM class between pre-test and post-test scores. Despite these increases, the results supported neither the first nor second hypothesis since the time by treatment interaction for both RSE and knowledge scores lacked significance. These results might be influenced by the lower-than-expected fidelity rate with the FOCE instructor, along with the higher-than-expected fidelity rate with the STM instructor and the higher-than-expected commonalities between the instructors.

Relationship Between Knowledge and Self-Efficacy

Students increased scores for both RSE and the knowledge questionnaire suggesting that the course aided student research identity development. The knowledge scores increase combined with the RSE scores increase adds support to the previous discussion about the relationship between knowledge and research self-efficacy. The correlation between students' knowledge scores and RSE scores statistically supports the relationship between knowledge and self-efficacy. Ultimately, the stronger relationship between knowledge scores and RSE scores by the end of the semester along with the 17.98% increase in variance explained speaks to the value of master's students learning research concepts in order to aid in increasing their research identity development, thereby confirming this approach. Moreover, the results confirmed the study's third hypothesis.

Limitations and Future Research Recommendations

This pilot study offers important lessons to future researchers investigating how to increase evidence-based teaching models and techniques, while maintaining high ecological validity. Despite its promising findings, there were multiple limitations.

No one field provided specific andragogical techniques to increase student self-efficacy. As such, the model drew from multiple disciplines. Also, it is important to note that studying research identity development in this way was based on the assumption that increasing students' knowledge would increase their competence, rather than students' lack of competency was due to another variable (e.g., irrelevancy). There is a possibility that irrelevancy could account for some of the variance not measured. It would be beneficial if a study could be designed where the different possible reluctances of master's counseling students could be investigated.

The sample was also a limitation. The final sample size was small reducing the study's power, and despite randomization neither ethnicity nor gender were equally distributed between the classes. Also, most of the previous investigations on research self-efficacy used to guide the current study were conducted with doctoral students as participants. Potential differences between doctoral students' attitudes towards research in comparison to master's students' attitudes towards this topic are still relatively unknown.

The lower-than-expected fidelity was a further limitation. Future researchers could consider other approaches to increase fidelity. Particularly, researchers could consider examining fidelity rates. Additionally, the close fidelities might indicate similarity in instructor characteristics, as opposed to teaching methods. Consequently, a study that had more than two instructors might be better suited to control for this variable. An alternative option would be to give additional training than what was provided in this study.

Finally, in line with the findings of DeCleene Huber et al. (2015), the investigator assumed that high research self-efficacy would lead to higher competence and confidence in enacting evidence-based practices in the field. To demonstrate this connection additional studies would need to be done. Particularly useful would be a longitudinal study to examine the connections, if any, that exist between levels of research self-efficacy leaving research class and actual engagement in evidence-based practices in the field. Lastly, testing whether FOCE can assist students in other topics could offer educators a broader use of the model.

Conclusions and Implications

This study contributed evidential support for an andragogy model by examining if it improved master's students research identity development, by way of research self-efficacy. First, a significant relationship between students' research knowledge and self-efficacy was found, suggesting that the importance of quality classroom instruction and a positive learning environment cannot be underappreciated. Additionally, the results support the custom of programs offering a class focused on research methods in order to meet accreditation standards. The correlation findings, in part, supported by the reported internal reliability of RSE offers a

potential assessment tool for studying master's students' research self-efficacy. Moreover, the study's results offer support regarding the use of FOCE in increasing research identity development, thus, offering educators some intentional ways in how they can produce students who can critically read and judicially apply research in the field.

The results of this piloted study are in line with Tiyuri et al. (2018) and Cheng et al.'s (2019) findings regarding the relationship between increasing self-efficacy and academic success, along with Gelso's (2006) recommendations that institutions support enhancing self-efficacy both formally and informally. Intentional focus on creating a culture to increase students' self-efficacy could benefit programs, departments, schools, and institutions. Collecting data on implementation could provide data to demonstrate meeting standards, missions, or the like. Additionally, the correlation between knowledge and self-efficacy offers administrators the option to capture self-efficacy changes in order to measure teaching effectiveness. Also, tracking self-efficacy could be used as a data-driven assessment regarding the effectiveness of existing scaffold progression. In these ways, this study offers educators options to have evidence-based teaching methods and measurement.

In summary, this study's results demonstrate a positive relationship between students' knowledge about research and their confidence in completing tasks related to research. Despite the lack of a significant time by treatment interaction for RSE or knowledge scores, FOCE offers educators a potential evidence-based model intended to increase students' self-efficacy along with evidence-based support for FOCE's 15 teaching techniques. Additionally, it shows support for educators' attention to how students will graduate capable and confident in their research ability and skills, so that practitioners are not simply wise consumers of research but are also able to critically and prudently evaluate research for effective application.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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