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Curricular Resource Use and Pedagogical Design Capacity of Florida Agricultural Education Teachers

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Abstract

A nationwide standardized curricular resource does not exist for school-based agricultural education. Teachers rely on several resources to develop instruction for students. Pedagogical Design Capacity (PDC) examines teachers' capacity to perceive and mobilize existing resources to develop instructional episodes. The purpose of the study was to determine the curricular resources used by Florida school-based agriculture education teachers and examine the PDC of Florida teachers for the resources they use. A census of Florida agriculture teachers was employed using an online instrument developed by the researchers adapted from previous studies. A response rate of 49.6% (n = 248) was obtained. The instrument was developed to determine the resources used by Florida teachers and examine their PDC with each resource. Respondents indicated using a mean of 8.6 resources with varying degrees of frequency. Various patterns of curricular use for the resources were found. Correlations between the use of specific resources was not found above a moderate level. Florida agriculture teachers rely on a variety of resources to develop instruction. These findings point to the potential for the continued development of various types of resources including resources that generate ideas for teachers, resources that provide lesson structure, as well as scripted lesson plans. We recommend future studies to examine the design features of specific curricular resources that can inform the development of future resources. We also encourage instruction to help inservice and preservice teachers understand and develop their PDC.

***Keywords*:** curriculum; curricular use; pedagogical design capacity; pedagogical content knowledge

Introduction

Instruction in school-based agricultural education has been continually evolving. A wide variety of content has been taught to students that spans an array of agriculture, food, and natural resource disciplines (Phipps et al., 2008). A canon of standard agricultural knowledge does not currently exist outside of broad national standards that must be unpacked by teachers in their local program (Phipps et al., 2008). This breadth allows programs to focus on agricultural knowledge relevant to their area and consider state and district initiatives. The process of developing curriculum, or "the set of experiences, courses or student, and activities outline by an educational program in which students must engage to achieve the desired educational outcomes of the program" (Phipps et al., 2008, p. 112-113), typically occurs at the program level by the teacher. This curriculum development process includes determining the depth of content, sequence of instruction, and learning experiences provided to students (Finch & Crunkilton, 1999). Research has made efforts in understanding how curriculum is implemented but leaves room for the full picture on the variability amongst states and districts (Ogawa et al., 2003; Rowan, 1996).

Curricular resources are materials that are needed to deliver an instructional lesson and engage students in the learning process. Because of the broad scope of agricultural education programs, myriad curricular resources exist with varying structure, content focus, and design. Some of the potential materials

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used by teachers include handouts, instructions, references, online media, and supplies (Thornton et al., 2020). A wide variety of education resources are accessible for agriculture teachers, and include information-based, file sharing, organization sponsored lesson plans, fee-based instructional materials, and web-based inquiry resources (D'Angelo et al., 2018). Educators can feel overwhelmed with the numerous resources available, while also investing much of their time in perusing materials that are accessible through various platforms (D'Angelo et al., 2008). Additionally, the constructs of curriculum planning play a role in how materials are sought and organized (Gottesman, 1977). As educators assess the goals, objectives, and form the educational plan for learners, the types of materials and variation of curricular resources can change (Gottesman, 1977).

Collaborative teaching and learning efforts have helped to develop educational resources that are shared and adapted within agricultural education (D'Angelo et al., 2018). Curricular resources and the planning that is involved in reviewing materials requires advanced planning by teachers (Phipps et al., 2008). For teachers to employ effective teaching strategies using curricular resources, there is considerable time invested in planning for the presenting, applying, and then evaluating of instructional objectives (Phipps et al., 2008). Selecting the appropriate resource is vital to instruction because it helps guide learners in meeting the instructional goals (Phipps et al., 2008).

Access to resources has had improvements through professional networking and sharing forums, such as NAAE's Communities of Practice and the Ag. Ed. Discussion Lab Facebook page (Ag Ed Discussion Lab, 2021; NAAE, 2021). In addition, curriculum materials and customizable lessons have become more readily available to educators through organizations like iCEV and MyCAERT (iCEV, 2021; MyCAERT, 2021). While there is not substantial research on the quality of resources being accessed by agricultural educators, previous studies have examined the variety and usage of curricular resources being utilized (Easterly & Simpson, 2020; Thornton et al., 2020).

Pedagogical Design Capacity (PDC) examines the relationship between instructional resources, teacher resources, and the classroom instruction that ensues (Brown, 2009; Knight-Bardsley & McNeil, 2016). In order to effectively implement teaching practices, teachers need to be actively engaged in the curriculum selection and design process versus passively teaching a shared lesson (Brown & Edelson, 2003). Brown and Edelson (2003) posit teaching is a process of design that requires teachers to mobilize resources in meaningful ways. To design instruction, teachers use three potential patterns for curriculum use: offloading, adapting, and improvising. Offloading refers to the use of materials with little or no modification, adapting is adding one's own elements of design to materials, and improvising is changing the lesson plan while actively teaching (Brown & Edelson, 2003).

The research around curricular resources for teachers has been transitioning from reform based curricular efforts that position curricular resources as a way to make a specific change in teaching practice to that of better equipping teachers with the tools they need to meet their goals (Amador, 2016). The curricular materials available have not completely realized this paradigm shift. In math, for instance (Remillard et al., 2019) found the overall curricular goals were not clearly stated for widely used math curricular resources. Providing the learning goals for resources is one example of improving the ergonomics of curricular resources. Another possible way to improve the ergonomics of curricular resources is to allow teachers to assemble the materials in a way that works for their students to meet the goals they have established. Amador (2016) found when math teachers tried to follow the curricular resources in a rigid way, they can focus too much on getting through the lesson rather than the student learning. Lambert et al. (2014) found when teachers attempted to implement a structured curriculum in agricultural education, the teachers had difficulty implementing the materials as they were designed and were not able to teach all the lessons. There is evidence to suggest teachers rely on multiple resources to design instruction. Polly (2016) conducted a national sample of math teachers and found teachers used several sources to design instruction for students and typically used packages designed to be complete curriculum to supplement their instruction. Rice and Kitchel (2016) found that agriculture teachers utilized curricular resources to make up

for a deficit in content knowledge, but experienced frustration with the resources available, specifically noting a lack of clear goals or purpose.

There has been investigation to improve the design of resources to bolster teacher PDC. Arias et al. (2016) examined educative features in curriculum or features in the resources specifically designed to enhance teacher learning and found they can be helpful in guiding teachers to support students learning science concepts. Arias et al.'s work furthered the initial calls from Ball and Cohen (1996) to provide more meaningful educative features in curricular materials for teachers. Davis et al. (2017) found the inclusion of such features can improve teacher content knowledge and ultimately enhance student learning. Krajcic and Delen (2017) found improving the ergonomics of curricular resources can help teachers add new pedagogical moves to their teaching.

Previous studies identified the frequency of curricular resources utilized, as well as the PDC for curricular resources used by agricultural education teachers in New Mexico and Utah (Easterly & Simpson, 2020; Thornton et al., 2020). A gap is still present in understanding how teachers use curricular resources to help them plan and develop the lesson they teach (Easterly & Simpson, 2020). Rice and Kitchel (2017) found agriculture teachers to have varying goals of agricultural education. Their overall goals for their program influenced how useful they found various resources to be in planning for instruction. Before curricular resources can be designed in an ergonomic way, the curricular resources used must be assessed. In Florida, there is not a state mandated curriculum or widely adopted resource. In order to provide direction for next steps to ease the burden of agricultural educators and the selection of curricular resources available, resources and PDC should be systematically evaluated. At the time of this study the curricular resource use and pedagogical design capacity of Florida agriculture teachers had not yet been explored (Easterly & Simpson, 2020; Thornton et al., 2020).

Theoretical Framework

Pedagogical Design Capacity (PDC) served as the theoretical framework for this study (Knight-Bardsley & McNeill, 2016). PDC is the act of designing instruction to teach students. According to Knight-Bardsley & McNeill, PDC is a product of instructional resources and teacher resources. Instructional resources are the tools and experiences teachers mobilize to plan instruction. These can include curriculum, professional development, and instructional tools. Teacher resources refer to the knowledge held by the teacher that is mobilized to plan instruction. These include subject matter knowledge, beliefs about teaching that subject, and pedagogical content knowledge.

According to Brown and Edelson (2003), teachers follow three patterns of curricular use, offloading, adapting, and improvising. Offloading refers to using curricular materials without modification. Resources designed to be offloaded are designed with constraints, or specific guardrails for teachers, that provide a scripted way to present these lessons. These types of materials can be helpful for beginning teachers or those who are teaching an unfamiliar concept. The concern with materials designed for offloading is the overreliance on the resources which could limit teacher creativity. Adapting refers to the practice of modifying instruction from the materials provided before it is taught to students. Adapting behavior would include omitting a suggested learning approach, adding a teaching strategy, or blending resources to create instruction. Improvising behavior refers to making changes to the instruction in action. Brown and Edelson used a description of a jazz musician who, understanding the key of the song, could create unique solos in real-time to enhance the piece being performed. Teachers using improvising behavior can shift instruction in action based on the response of their students or other factors that arise during instruction. Teachers who have more developed PDC will be able to implement improvising behavior.

The design of resources can lend itself to a particular pattern of curricular use. Brown and Edelson (2003) and Matic (2019) found teachers typically exhibit offloading behavior because they recognize the pedagogical benefit of the resource, and it aligns with their goals. Resources designed to be delivered with

minimal adapting could include scripted lesson plans, specific times for learning approaches, and descriptive student assignments. Resources designed for adapting and improvising may provide less specific teacher direction and focus more on the content to be taught to students. Thornton et al. (2020) examined the curricular use of New Mexico SBAE teachers and found resources like CASE and Teachers Pay Teachers were highly offloaded by teachers and had lower levels of adaption and improvising. Resources like CAERT and NAAE Communities of Practice had lower levels of offloading and higher levels of adapting and improvising. Easterly & Simpson (2020) examined the curricular use of SBAE teachers in Utah and found high levels of offloading for iCEV, AET, and National FFA My Journey, and found higher levels of adapting with the curriculum provided by Utah FFA and NAAE Communities of Practice. In Thornton et al. (2020) and Easterly and Simpson (2020) New Mexico and Utah each had a state provided resource they used. Florida does not currently have a resource provided by the state related to the standards.

Purpose and Objectives

The purpose of this study was to determine the curricular resources used by Florida SBAE teachers and examine the PDC of Florida teachers for the resources they use. The study was guided by the National Association of Agricultural Education Research Priority Area 5: Efficient and Effective Agricultural Education program (Thoron et al., 2016). The study was guided by the following objectives:

1. Describe the curricular resources use of Florida SBAE teachers.
2. Describe the PDC patterns of Florida SBAE teachers for the resources they use.
3. Examine the relationship among the resources used by Florida SBAE teachers.

Methods

A descriptive correlational design was used to examine the teacher self-efficacy and curricular resource use of Florida SBAE teachers. A census of SBAE teachers was used because the population was accessible, and it allowed these findings to be generalized. A directory of SBAE teachers was developed by the University of Florida department of Agricultural Education and Communication. At the time of data collection, there were 515 in the frame. After initial contacts were made, 15 teachers were removed from the frame because they left their teaching position and had not been replaced resulted in a corrected population frame of N = 500. The instrument was distributed using the recommendations of Dillman et al. (2014) to maximize response rate. Pre-notice letters were mailed to the teachers with a $1 cash incentive. The link to an electronic instrument using the Qualtrics platform was emailed to the teachers. The timing of the email was when the pre-notice letter was expected to arrive. Follow-up emails were sent to non-respondents. A total of 248 completed the instrument yielding a response rate of 49.6%. To test for non-response bias, the known demographic variables of non-respondents and respondents were compared using an archival analysis technique following (Johnson & Shoulders, 2019; Rogelberg & Stanton, 2007). Chi-square tests indicated no significant difference in gender (X^2 (1, N = 500) = 1.18, $p < .05$) and FFA district (X^2 (5, N = 500) = 1.52, $p < .05$). The data were considered representative of the population and the results were generalized.

An instrument was developed by the researchers to determine the curricular use of Florida teachers. A similar instrument was utilized in previous studies with teachers in Utah (Easterly & Simpson, 2020) and New Mexico (Thornton et al., 2020). The instrument asked teachers to select the resources they use to plan and deliver instruction from a list of 23 resources. The list was created by the researchers who have knowledge of the resources used by teachers. To ensure validity, the list of resources was confirmed by a panel of experts outside the study including the state agricultural education coordinator and a teacher educator in the state not included in the study. Options were also provided for textbooks and other resources, not on the list. Utilizing skip-logic in Qualtrics, participants were asked follow-up questions for the resources they use. The teachers were asked to rate their frequency of use using the response options of *once per semester or less*, *twice per semester*, *monthly*, *weekly*, and *daily*, which were given a numerical

value of 1-5 respectively and analyzed as a continuous variable using real limits. Participants were asked to rate the structure and organization of the resource using a 0-100 sliding scale where 0 was anchored as Very Poor and 100 was anchored as Very Good. To measure adapting, participants were asked to rate their level of modification using a sliding scale anchored with 0 as No Modification and 100 as A lot of Modification. To measure offloading, participants were asked to rate their familiarity with the content using a sliding scale anchored with 0 as Not Familiar and 100 as Familiar. To measure improvising, participants were asked to indicate how much they modified their instruction when teaching using a sliding scale anchored by 0 No Modification and 100 A lot of Modification. Sliding scales were used rather than radio buttons to make the questionnaire more engaging for participants and improve the data quality following the recommendations of Roster et al. (2015). Data were analyzed using SPSS version 27. Frequencies were calculated for the resources used by teachers. Means and standard deviations were used to calculate the curricular use patterns of the teachers. Point biserial (r_{pb}) correlations were used to measure the relationship between the resources used by teachers (Davis, 1971).

The respondents averaged 12.8 (SD = 10.3) years teaching. There were 98 (39.5%) teachers who taught at least one middle school course and 174 (70.2%) who taught at least one high school course. A total of 61 (24.6%) teachers held an advance degree.

Results

Describe the curricular resources use of Florida SBAE teachers

Participants were asked to select the resources they use from a list and list any additional resources they used. Respondents indicated using a mean of 8.6 resources (SD = 4.1). The number of resources used ranged from 0 to 29. The number of resources used were normally distributed. The number of resources used by participants are displayed in table 1.

Table 1

Distribution of the Number of Curricular Resources Utilized by Florida SBAE Teachers

Number of Resources	*f*	*%*
0	4	1.6
1	4	1.6
2	5	2.0
3	9	3.6
4	16	6.5
5	15	6.0
6	27	10.9
7	25	10.1
8	25	10.1
9	19	7.7
10	20	8.1
11	17	6.9
12	22	8.9
13	15	6.0
14	9	3.6
15	7	2.8
16 or more	9	3.6

The most frequently used resource by Florida agriculture teachers were IFAS Extension Materials, which were used by 60.1% (f = 149) of the teachers. More than half of the respondents indicated using Agriculture in the Classroom (59.7%, f = 149) and iCEV (51.6%, f = 128). The number of teachers using

each resource is displayed in table 2. Teachers were asked to indicate if they used a textbook. Of the respondents 154 (62.1%) reported using at least one textbook, 81 (32.7%) indicated using two textbooks, 40 (16.1%) reported using a third textbook, and 15 (6.0%) indicated using a fourth textbook. When asked to specify the name of the textbook they used, 147 (59.3%) teachers responded that they used a book related to agriscience explorations/fundamentals/introduction topics, 31 (12.5%) used a veterinary science textbook or manual, 30 (12.1%) reported using an animal science book, 24 (9.7%) reported using a horticulture book or manual, and 15 (6.0%) reported using an agricultural mechanics textbook. Because teachers used various textbooks, the follow-up questions were not analyzed for the textbooks.

Table 2

Frequency of Curricular Resources Utilized

	Teachers Using Resource		Frequency of Use*		Rate of Structure and Organization*	
Curricular Resource	*f*	%	*M*	*SD*	*M*	*SD*
IFAS Extension Materials	149	60.1	2.39	0.9	70.3	22.7
Agriculture in the Classroom	148	59.7	2.60	1.2	67.7	21.9
iCEV	128	51.6	3.29	1.1	73.0	25.5
United States Department of Agriculture (USDA)	120	48.4	2.07	1.0	58.2	21.4
NAAE Communities of Practice	118	47.6	2.61	1.0	62.9	23.9
Pinterest	109	44.0	2.56	1.2	55.4	26.3
Teachers Pay Teachers	106	42.7	2.46	1.1	70.1	24.1
Georgia Ag. Ed.	100	40.3	2.28	1.0	70.3	19.5
National FFA Resources	96	38.7	2.64	0.9	72.7	21.7
One Less Thing	88	35.5	2.47	1.3	79.5	19.3
AEST	88	35.5	2.81	1.15	69.1	23.6
Agriculture Experience Tracker (AET)	54	21.8	2.90	1.0	59.6	22.1
Nutrients for Life	54	21.8	1.74	0.9	74.0	21.9
CTE Online	50	20.2	2.37	1.2	68.9	23.3
CAERT	45	18.1	2.93	1.1	73.2	19.4
Glen Rose FFA	45	18.1	2.07	1.0	64.2	24.1
School/District Curriculum	45	18.1	4.20	0.8	73.6	23.3
FFA Blue 365	42	16.9	2.07	1.1	68.8	23.3
agednet	41	16.5	2.65	1.2	73.6	24.4
OSHA	34	13.7	1.65	0.9	60.6	24.9
AEC Online Resources	31	12.5	2.19	1.1	66.9	19.7
Animal Care Technologies	30	12.1	3.07	1.1	68.8	28.5
CASE	25	10.1	2.68	1.4	70.0	21.9

Note. Responses were reported on a scale from 0-100 and were only measured by the teachers who utilized the resource.

Follow-up questions were asked for each resource selected using skip-logic in Qualtrics. The responses indicated the frequency of using the resource and a rating of the structure and organization of the resource. Only respondents who indicated they used the resource were asked the follow-up questions about the resource. The highest frequency of use was school/district curriculum $M = 4.20$, SD =.08 which aligns with weekly as defined by the real limits. Teachers who used iCEV reported a frequency of 3.29 (SD = 1.1) which aligns with Monthly as defined by the real limits. Animal care technology was used by 30 teachers and had an average usage of 3.07 (SD = 1.1) which aligns with Monthly as defined by the real limits. The other resources were used less than once per month as indicated by the real limits.

The respondents were asked to rate the structure and organization using a semantic differential sliding scale with hidden numerical values ranging from 0-100 anchored as very poor to very good respectively. The resource with the highest rated structure and organization was One Less Thing (*M* = 75.9, SD = 19.3). Other resources with highly rated structure and organization were Nutrients for Life (*M* = 74.0, SD = 21.9), School/District curriculum (*M* = 73.6, SD = 23.3), and National FFA Resources (*M* = 72.7, SD = 21.7). The resources with lowest rated structure were Pinterest (*M* = 55.4, SD = 26.3) and USDA (*M* = 58.2, SD = 21.4).

Describe the PDC patterns of Florida SBAE teachers for the resources they use.

Teachers were asked to rate their level to which they modified the resources they use before teaching to operationalize adapting behavior. The mean level of lesson modification ranged from 33.5 to 53.3. The lowest level of modification, which indicates lower adapting, was iCEV (*M* = 33.5; *SD* = 27.4), One Less Thing (*M* = 37.5; *SD* = 24.2), and Animal Care Technologies (*M* = 38.0; *SD* = 27.7). Resources with high levels of modification, or more adapting, were Pinterest (*M* = 69.5; *SD* = 24.4), USDA (*M* = 53.3; *SD* = 29.6), Glenrose FFA (*M* = 53.2; *SD* = 27.1), and NAAE Communities of Practice (*M* = 52.4; *SD* = 23.9). Resources with high familiarity of content were used to indicate lower levels of offloading behavior. These resources were School/District Curriculum (*M* = 82.6; *SD* = 19.8), Animal Care Technologies (*M* = 75.6; *SD* = 24.4), One Less Thing (*M* = 73.1; *SD* = 23.6) and iCEV (*M* = 72.9; *SD* = 25.5). The resources with the lowest familiarity of content were IFAS Extension Materials (*M* = 55.6; *SD* = 27.1) and AET (*M* = 55.9; *SD* = 34.2). The resources with the highest level of improvising were Pinterest (*M* = 67.8; *SD* = 23.3), OSHA (*M* = 62.0; *SD* = 24.3), and Agriculture in the Classroom (*M* = 60.9; *SD* = 23.4). The resources with the lowest level of improvising were AET (*M* = 46.1; *SD* = 24.9), Animal Care Technologies (*M* = 48.4; *SD* = 27.2)

Table 3

Patterns of Pedagogical Design Capacity for Resources used by Florida Agriculture Teachers

		Level of Lesson Modification (Adapting)		Familiarity with Content (Offloading)		Level of Improvisation (Improvising)	
Curricular Resource	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*
IFAS Extension Materials	149	44.6	23.0	55.6	27.1	58.8	24.8
Agriculture in the Classroom	148	45.7	21.1	62.5	29.2	60.9	23.4
iCEV	128	33.5	27.4	72.9	25.5	53.1	25.6
United States Department of Agriculture (USDA)	120	53.3	29.6	60.3	21.6	57.6	23.2
NAAE Communities of Practice	118	52.4	23.9	67.3	25.4	58.9	24.1
Pinterest	109	69.5	24.4	69.6	23.9	67.8	23.3
Teachers Pay Teachers	106	48.1	25.8	65.8	25.7	58.0	24.1
Georgia Ag. Ed.	100	49.5	23.1	66.5	25.1	57.1	21.0
National FFA Resources	96	39.9	24.2	71.1	24.1	55.3	23.3
One Less Thing	88	37.5	24.2	73.1	23.6	57.3	25.0
AEST	88	46.0	27.9	64.4	25.3	51.9	27.5
Agriculture Experience Tracker (AET)	54	36.9	25.6	55.9	34.2	46.1	24.9
Nutrients for Life	54	51.7	25.2	67.2	26.5	60.5	23.1

Table 3

Patterns of Pedagogical Design Capacity for Resources used by Florida Agriculture Teachers, continued…

CTE Online	50	45.6	25.7	67.7	21.4	51.8	24.3
CAERT	45	43.5	25.4	69.9	22.5	53.4	24.5
Glen Rose FFA	45	53.2	27.1	67.0	21.8	53.2	25.1
School/District Curriculum	45	45.2	33.2	82.6	19.8	56.7	29.3
FFA Blue 365	42	35.2	24.0	63.3	26.3	54.5	23.9
agednet	41	40.3	26.5	68.3	20.7	49.7	24.1
OSHA	34	51.5	31.4	59.5	30.1	62.0	24.3
AEC Online Resources	31	42.1	18.8	62.7	22.8	53.4	16.9
Animal Care Technologies	30	38.0	27.7	75.6	24.4	48.4	27.2
CASE	25	44.6	30.9	65.8	23.1	51.4	27.9

Note. Responses were reported on a scale from 0-100 and were only measured by the teachers who utilized the resource.

Examine the relationship among the resources used by Florida SBAE teachers.

Point-biserial correlations *(r_{pb})* were used to report the relationship between resources being used by teachers. A higher correlation indicated teachers who used one resource is likely to use the resource it correlated with. Relationships were reported using orders of magnitude as recommended by Davis (1971) and reported on table 4 and table 5. The resources with moderate association were IFAS Extension Materials and USDA (r_{pb} = .38) and Agriculture in the Classroom and Nutrients for Life (r_{pb} = .31). The remaining resources had a low or negligible association.

Table 4

Point-Biserial Correlations (r_{pb}) and phi Coefficients Between the Teacher Self-Efficacy and Curricular Resources

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. IFAS	--											
2. AITC	.17	--										
3. iCEV	-.05	.03	--									
4. USDA	.38	.14	-.05	--								
5. NAAE	.12	.11	.08	.13	--							
6. Pinterest	.09	.18	-.02	.05	.28	--						
7. TPT	.01	.20	.15	-.02	.22	.25	--					
8. Ga. Ag. Ed.	.18	.24	.09	.21	.19	.13	.07	--				
9. FFA	.23	.21	-.08	.24	.24	.11	.23	.21	--			
10. OLT	.07	.06	.09	.04	.26	.24	.33	.18	.17	--		
11. AEST	.17	-.01	.09	.14	.15	.02	.09	.08	.14	.03	--	
12. AET	.05	-.06	.04	.02	.10	.08	-.02	.10	-.04	.10	.18	--
13.NFL	.09	.31	-.04	.10	.07	.16	.02	.16	-.02	-.00	.04	-.04
14. CTE	.06	.07	.10	.10	.15	.10	.03	.12	.12	.13	.11	.08
15. CAERT	-.00	.07	.10	.07	.10	.03	.19	.17	.01	.04	.11	.08
16. GLEN	.09	.05	.04	.11	.10	.05	.04	.34	.06	.09	.04	.11
17. School	-.02	-.06	-.05	.09	-.13	-.02	-.20	-.02	-.01	-.15	.02	.08
18. Blue365	.15	.20	.05	.10	.02	.03	.05	.02	.06	.05	.09	-.13
19. Agednet	.01	.08	.06	.09	.08	.00	.08	.14	.11	.10	-.01	.13

Table 4

Point-Biserial Correlations (r_{pb}) and phi Coefficients Between the Teacher Self-Efficacy and Curricular Resources, continued…

20. OSHA	.18	-.08	.08	.29	.04	.03	.04	.03	.14	-.03	.22	-.07
21. AEC	.29	.01	-.10	.22	.23	.11	.02	.16	.13	.08	.10	.16
22. Animal	-.05	-.07	-.01	-.06	.17	.10	.03	-.10	.04	,06	.04	-.02
23. CASE	.08	.03	.00	.21	.08	.08	-.05	.13	.06	.06	.00	.12

Note. Significant correlations were not flagged following Davis's (1971) recommendation to express orders of magnitude.

Table 5

Point-Biserial Correlations (r_{pb}) and phi Coefficients Between the Teacher Self-Efficacy and Curricular Resources

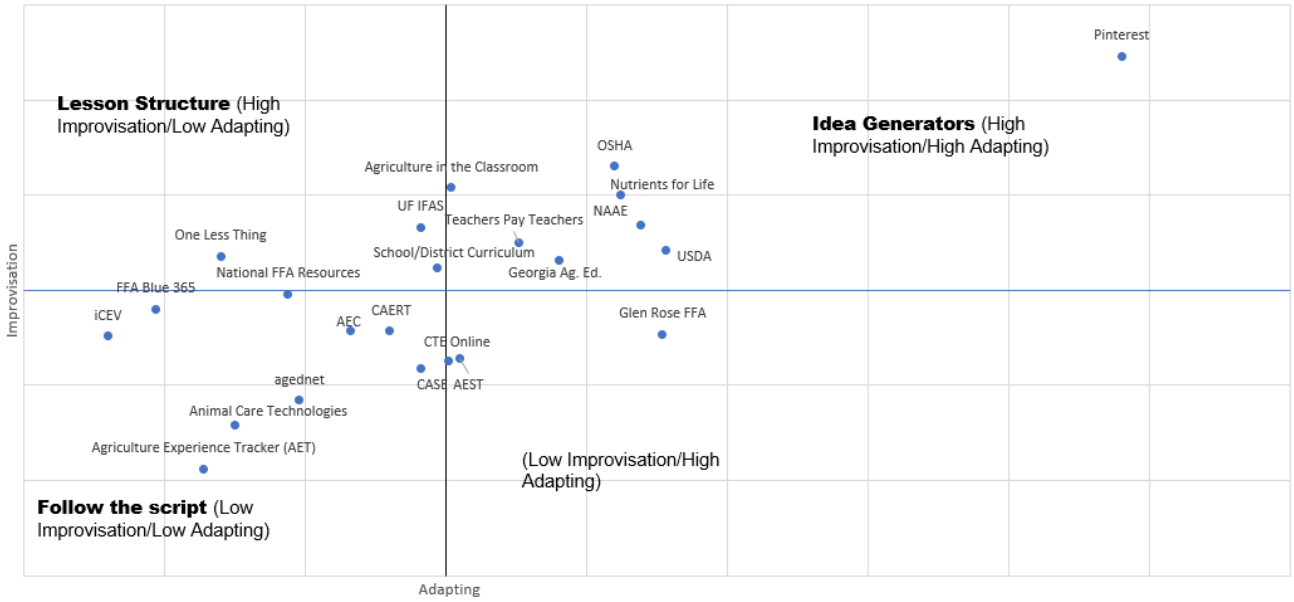
Variable	13	14	15	16	17	18	19	20	21	22	23
13.NFL	--	-.02	-.05	.05	.03	.02	.00	.07	.07	-.08	.12
14. CTE		--	.05	.10	.10	.07	.07	.12	.14	-.03	.17
15. CAERT			--	.05	.05	-.05	.04	.03	.01	-.05	.16
16. GLEN				--	.05	-.12	.13	.09	.20	-.05	-.02
17. School					--	-.02	-.07	.15	.01	-.01	.23
18. Blue365						--	.09	.16	.12	-.00	.06
19. Agednet							--	.14	.03	.00	-.04
20. OSHA								--	.10	.18	.22
21. AEC									--	-.07	.16
22. Animal										--	-.04
23. CASE											--

Note. Significant correlations were not flagged following Davis's (1971) recommendation to express orders of magnitude.

To examine the relationship of level of adapting and improvising, a scatterplot was created using the mean scores for the level of adapting and improvising (see Figure 1). The baseline of the X and Y axis represent the mean scores for adapting and improvising respectively. Scores below the zero point of the line represent resources below the mean of this sample. The upper right quadrant, high improvising/high adapting was named "Idea Generators". Resources that fell in this quadrant served as a starting point for teachers put typically allow for variation and improvising in instruction. Pinterest, NAAE communities of practice, Nutrients for Life, and OSHA fell in this quadrant. The "Lesson Structure" quadrant included resources with low adapting and high improvising. One Less Thing fell within this quadrant. These resources provide a good structure for offloading while providing a stable base for improvising. The "Follow the Script" quadrant consisted of resources with low levels of adapting and low levels of improvising. These resources are heavily relied on by the teachers. Agriculture Experience Tracker, Ag. Ed. net, and Animal Care Technologies were in this quadrant. There were not any resources with low levels of adapting and improvising.

Figure 1

XY Plot of Resources Based on Level of Adapting and Improvising



Conclusions/Recommendations

The data collected in this study show a high number of resources being utilized to help support teachers in the development of their instructional materials. The average number used by teachers was 8.6 different resources. Approximately 47% (N = 116) of respondents reported using between 6-10 curricular resources. This reflects the need for teachers to select the resources that work best for them to teach their students, versus a one size fits all approach. Teachers in New Mexico and Utah used and average of 7.5 and 4.9 resources respectively (Easterly & Simpson, 2020; Thornton et al., 2020). While these were not identical studies and data collection procedures and exact differences cannot be drawn, the difference in the number of resources used is worth noting. Utah and New Mexico provided a centralized resource used by a high percentage of teachers. In Florida, a centralized resource does not currently exist. Further studies could illuminate how the presence of a centralized resource for teachers impacts teacher PDC. When examining the frequency of the resources used, teacher in New Mexico and Utah used the state provided resource with more frequency than any resource in Florida. In the absence of a centralized resource, teachers in this study utilized several resources to design instruction.

To meet the need of learners, exploration of a wide variety of resources can assist educators in creating effective learning activities (D'Angelo et al., 2018). Agriculture teachers in Florida reported the use of IFAS Extension Materials and textbooks more than any other resource. The most frequently utilized resource was school/district curriculum, reported as being used weekly by the limits set in this study. Other resources were used monthly or less, indicating a wide range of resources were employed by SBAE teachers in a variety of ways. The resource with the highest rating for structure and organization was One Less Thing. The moderate levels of offloading and high levels of improvising indicate this resource is something that teachers can pick up and use with relative ease and it matches the goals they have for their program. The design of materials like this should be further explored.

The respondents rating of the structure of resources varied. Resources like One Less Thing and Nutrients for Life were rated highly for their structure compared to resources like Pinterest, USDA, and AET. When examining the purpose of these resources, the rating of their structure makes sense. One Less

Thing and Nutrients for Life set out to develop structured lesson plans and teaching materials for teachers. The resources with lower structure have varied functions and serve as a resource as an ancillary benefit. The lower rating for community sharing tools like NAAE Communities of Practice and Pinterest should be explored further. This lack of perceived structure may suggest the curation of resources in an organized manner could be more beneficial to teachers than large community shared platforms. Based on the frequency of use, community sharing platforms have a place, but further research should be done to determine the most ideal way to house these resources for teachers.

The comparison of variations from means for improvising and adapting on the XY axis provides an analysis of how resources are used by teachers. The resources with high improvising and low adapting were given the title *lesson structure* resources. One less thing clearly fell into this quadrant. Resources with high improvising and high adapting fall into the *idea generators* quadrant. Resources like Nutrients for Life, NAAE Communities of Practice, and Georgia Ag. Ed. fell into this quadrant. The higher level of adapting means the teachers feel the need to modify these materials before they teach. Nutrients for Life provides resources that appear to be designed with low levels of adapting in mind. They provide lesson plans, activities, and PowerPoints for teachers. On one portion of their website, they have a page of curriculum for teachers. However, these data suggest Florida teachers are using those resources to generate ideas or help develop content outlines. The design of these materials should be investigated in future studies to determine the ideal type and blend of slides, student activities, content, and other materials that could lead to adapting behavior.

The resources being used by SBAE teachers with the lowest level of modification, indicating a high level of offloading, were iCEV, One Less Thing, and Animal Care Technologies. All three resources are accessed online. Both iCEV and One Less Thing are comprehensive resources, including alignment to national standards, instructor notes, presentations, and activities. Animal Care Technologies is the resource that must be used by SBAE teachers who are certifying students in the veterinary assisting pathway and is accessed for all examinations for this Florida approved industry certification. The resource includes videos, review questions, online curriculum, and is completely student-centered in its use. Thus, it is not surprising that this curricular resource is not modified by teachers.

The resources used by SBAE teachers that showed the lowest adapting behavior was similar to those that high levels of improvising behavior, with the addition of School/District Curriculum at the top of the list. School/District Curriculum would be designed to align with state standards, and potentially provide additional materials and information that aligns to local needs, thus making its offloading highest among the respondents. Highest ranking materials for offloading also included curricular resources that were comprehensive and included several components that could be utilized by teachers. Materials with the highest offloading included Florida Extension Materials and AET. Further research is needed to examine how these resources impact teacher PDC. Extension materials are often housed on the IFAS Extension website and provide all current peer-reviewed publications that were developed to support the areas of Agriculture, Natural Resources, 4-H & Youth Development, Lawn & Garden, family Resources, and Indexes & Collections (University of Florida IFAS Extension, 2021). The Agricultural Experience Tracker (AET) is a curricular resource that provides teachers with career & strategic planning tools related to FFA and Supervised Agricultural Experience (SAE), as well as the sole site used by SBAE teachers for completing and submitting both the State and American FFA Degrees in Florida (AET, 2021). More research is needed, as follow up interviews with educators could provide insight on how teachers use these resources to inform their practice.

An analysis of the point-biserial correlations did not yield any relationships between resources higher than a moderate level. This lack of a strong relationship indicates the independence of these resources used by Florida teachers. There were no cases were a group of teachers who relied heavily on one resource also relied on another. There were moderate relationships found among curricular resources used by Florida SBAE teachers. Associations were found amongst Florida Extension Materials and USDA, as well as

Agriculture in the Classroom and Nutrients for Life. When comparing Florida Extension Materials and USDA curricular materials, there is potential for materials to complement one another, as Florida Extension Materials provide peer-reviewed publications that are student and consumer friendly materials, while USDA provided lessons plans that includes activities and hands-on labs for the classroom that could complement University of Florida Extension Materials (University of Florida IFAS Extension, 2021; USDA, 2021). Agriculture in the Classroom and Nutrients for Life curricular resources had a similar format to USDA materials, providing hands-on labs and lessons (FAITC, 2021; NAITC, 2021; Nutrients for Life Foundation, 2021). The correlation between these materials may indicate the preference of the SBAE teacher for curricular resources that provide technical content, alongside hands-on activities and labs that support the material.

The findings of the research provide a clear picture of what resources Florida teachers use to deliver instruction in their classroom. It also explores how these resources lead to different types of PDC in teachers. This study, on its own, cannot determine the most ideal design of resources for teachers in Florida. It does, however, provide insight to the number of resources used, how often they use the resources, and their impressions of the organization of the resources. It also provides a glimpse into how these resources impact teacher PDC. Based on the findings in this study, it is recommended that further research delves deeper into curricular resources of SBAE teachers not only in Florida, but also nationwide. Previous studies have recommended digging deeper into the *reasons* educators utilize or modify specific curricular resources (Easterly & Simpson, 2020; Thornton et al., 2020). According to Brown (2009), an ideal blend of offloading, adapting, and improvising behaviors does not exist. Resources are used differently by teachers based on their instructional goals. Just as teachers use resources differently, curriculum designers could explore the impact of designing resources with specific PDC uses in mind. Further investigation on how teachers interact with curricular resources of various designs is warranted. This investigation provided a broad view of the resources used by Florida agriculture teachers. Future studies should examine how specific design features impact PDC. This study provided a limited view of how teachers develop PDC. Qualitative studies could illuminate how and why curricular resources impact PDC and inform the design of future resources. The goal for research in this area should be to design resources that help teachers meet their established goals for their programs and learners. This design will improve with empirical evidence.

While this study did not examine how PDC changes over time or differs for groups of teachers, it does provide evidence that different resources lead to different PDC behaviors. Further research in PDC could explore how PDC is developed by teachers. Inquiry in this area could provide recommendations for preservice teacher education programs as well as those who support alternative licensure teachers. Preservice teacher education programs could provide students with tutorials on how and where to access a variety of curricular resources, and skills in successfully modify materials to meet the objectives of the lesson and needs of learners. The findings of the study align with previous studies that indicate SBAE teachers in specific states utilize curricular resources differently, based on a variety of available resources, as well as preferences of the individual SBAE teacher (Easterly & Simpson, 2020; Thornton et al., 2020). Further studies should explore SBAE teachers use of curricular resources in other states, as well consider the use of qualitative measures to obtainer a richer descriptions of teacher preference and practice.

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