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Curriculum Development of Agricultural Educators in South Dakota

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CURRICULUM DEVLEOPMENT OF AGRICULTURAL EDUCATORS IN SOUTH DAKOTA

BY

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THESIS ACCEPTANCE PAGE

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This thesis is approved as a creditable and independent investigation by a candidate for the master's degree and is acceptable for meeting the thesis requirements for this degree. Acceptance of this does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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This dissertation is dedicated to my friends, family and advisors that have pushed me to always be my best.

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ABBREVIATIONS

COVID19	Coronavirus
AKT	Agri-Science Knowledge for Teaching
PCK	Pedagogical Content Knowledge
TPCK	Technological Pedagogical Content Knowledge
CPK	Content Pedagogical Knowledge

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ABSTRACT

CURRICULUM DEVELOPMENT OF AGRICULTURAL EDUCATORS

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Curriculum development is an essential component of teaching. Understanding how agriculture education teachers utilize, develop, and adapt content to curriculum can benefit teachers to spend less time on curriculum development. Recognizing the way agriculture education teachers use content in curriculum implementation will allow curriculum developers to create materials that can effectively be used by teachers. This study also looked at the affects of how COVID19 pandemic affected the way teachers locate and develop curriculum. The purpose of this study was to evaluate the way agriculture education instructor's usage of content for curriculum development, implementation decisions and the affects of the COVID19 pandemic.

During this study, a questionnaire was sent out to all agriculture education instructors in South Dakota, using the Dillman Method. The survey was given four a total of four weeks, with reminders going out every week. The findings of this study showed that the most common place to find resources include online learning communities including NAAE Communities of Practice, Agriculture Education Discussion Lab and Teachers Pay Teachers. Teachers also used these online communities to help evaluate credibility of the resources. Along with checking the authors and sources the curriculum came from. The study also concluded that COVID19 pandemic had both positive and negative effects on teacher's curriculum development, while the full affect will not be known for years to come.

CHAPTER I: INTRODUCTION

Curriculum development is an essential component to teaching and involves the interaction between teachers and the materials (Males & Setniker, 2019). The use of materials by teachers in their classroom is called, curriculum implementation. Curriculum implementation refers to the "planned or officially designed course of study is translated by the teachers into the syllabus, schemes of work and lessons to be delivered to students" (Chaudhary, 2015, p. #985). To create a successful educational program curriculum needs to be created and learned by teachers before being taught to students. This strategy of putting content together allows for teachers to be at the forefront of student learning. The goal of a successful educational program and effective curriculum development should be to meet the needs and current demands of culture, society and the expectations of the population being served (Alsubaie, 2016). In order to achieve this goal curriculum development and implementation should be taught during pre-service education and continued throughout the teacher's career through professional development opportunities.

Pre-service Teachers

During their pre-service education, teachers are taught to adapt and create curriculum (Newcomb et al., 2004). Curriculum development involves and iterative process that includes teachers as designers therefore it is important to engage pre-service teachers early in their teacher programs as curriculum designers to prepare them for their careers ahead. With the rapidly changing education landscape, it is imperative that pre-service teachers are situated early in their program to learn emerging pedagogical

strategies. (Shively & Palilonis, 2017). Implementing curriculum requires materials. In their study of science education, Forbes and Davis stated:

> Curriculum materials are a crucial tool which teachers engage students in science inquiry. In order to use of curriculum effectively, however, teachers must develop a robust capacity for pedagogical design or the ability to mobilize a variety of personal and curricular resources to promote student learning. (Forbes & Davis, 2010, p. #1)

There are multiple pedagogical frameworks in which pre-service teachers can use to help further their engagement with curriculum development including the Danielson's Framework (Danielson, 2007) and Backward Design (Wiggins & McTighe, 2005). Backward Design provides pre-service teachers the opportunity to demonstrate the ability to set more clear and suitable goals for student in the class. Kelling and Gibson (2005) found, "Backward design students attained a higher level of performance when displaying content knowledge and making connections between the content and other disciplines and developing plans that reflected current research on best pedagogical practices" (p. #32). Design think strategies can also help pre-service teachers develop curriculum materials. Design thinking is a problem exploration with five iterative phases; empathy, ideate, prototype, move and design (Shively & Palilonis, 2017). According to Shively and Palilonis (2017), 90 percent of pre-service teachers reported that they believed that design think strategies are means to develop curriculum that they will use in their future curriculum, development, and activities. Through the Danielson's Framework for teaching focuses on teacher development it is "designed to permit educators to focus

on the different domains, components, and elements of the framework in analyzing and assessing their own practice and in devising techniques to strengthen the practice."

Teacher Learning

Teachers are an essential part of curriculum development. The classroom teacher's knowledge is essential because it is linked to students gains, crosses theoretical concepts and instruments (Charalambous & Hill, 2012). Teachers are expected to provide and teach meaningful content that helps students meet learning goals in the context of authentic activities while addressing the needs of diverse learners Teacher learning is essential to teacher practices – including classroom instruction, planning lesson modifications, assessment and collaboration with colleagues, along with providing content for students, teachers must also be able to develop their own knowledge of the content in order to make real time instructional decisions (Davis & Krajcik, 2005).

Textbook Usage in Curriculum Development

Even with the advancement of the internet, textbooks are still used in educational curriculum. According to Banilower (2012), 80% of mathematics teachers in the United States report using some kind of curricular program or textbook for their instruction. While new math education teachers are also more likely to use their textbooks more faithfully than experienced teachers because they are still learning their role but as the school year continues as-is curriculum decreased (Taylor, 2013).

"Underlying many school reform efforts have the notion that classroom teachers are in the best position to know their students' needs and interests and therefore should make decisions about instruction for their students," (Banilower, 2012, p. #69). In order

to make the best educational and instruction decision teachers, "necessarily need to select from and adapt materials to suit their own students. Teachers change the curriculum, including supplementing or replacing materials for classroom activities (Taylor, 2013, p. #). Some adaptions that teachers make include replacing material with other content, using videos to explain method and omitting content that does not fit their lesson plans. This may create a gap between curriculum developer's intentions for students and what is happening in the classroom.(Ball & Cohnen, 1996,). The selective use of content may cause a gap in the coherence of materials. When the gap between teaching and materials widens, teachers must figure out how to deal with student understanding, probe content and map instruction – teachers must invent or ignore a great deal (Ball & Cohnen, 1996). This puts curriculum designers in a tough spot. Curriculum designers want the resources they provide to function in sync with the goals and context along with making them effective for teachers (Choppin et. al., 2018). To aid teachers in this adaption some textbooks offer teacher's guides however sometimes these offers little support. Using teacher's guides within textbooks can be helpful but modifying guides and textbook lesson can be complicated (Ball & Feiman-Nesmar, 1988).

Teacher Interaction and Involvement in Curriculum Implementation

According to Alsubaie (2016, p. #106), "The most important person in the curriculum implementation is the teacher." The knowledge, experience and competencies teachers have been central to any curriculum development effort (Alsubaie, 2016). Along with knowledge, attitudes play a role in curriculum implementations. Beliefs of how students learn, a teacher's role in the classroom, the ability levels of students and the relative of content topics play a role in how teachers implement curriculum (Cronin-

Jones, 1991). Attitudes and interactions are pertinent for teacher to engage in curriculum development effectively.

Online Resources for Curriculum Planning

In decades past, there have been several efforts in the United States to capitalize on the possibilities afforded by the internet (Recker et. al, 2007). This can help teachers provide quality instruction to each student. The internet provides a portal to nearly infinite set of digital resources that could help teachers in their differentiation of instruction, but the unmanaged nature places a burden of filtering or evaluating digital resources, adding to the significant workload of teacher (Maull et. al. 2010). Researchers need to develop applications to condense and help teachers navigate the unchartered space of the internet. Learning teachers' online behaviors could hold useful clues to the development of applications to improve student outcomes and teacher outcomes by improving access to and use of digital materials within the classroom instruction and learning context (Maull et. al. 2010).

During 2020, the COVID-19 pandemic accelerated the expansion of the need of online education. Online platform alternatives such as Zoom, Slack, Google Meet, and EduPage were used for online education and live communication (Basilaia & Kvavadze, 2020). However, during the pandemic teachers indicated that nearly 30% of all students were not regularly completing assignments (Catalano & Anderson, 2021). As we continue to educate students, post-pandemic it will be pertinent to find solutions to use online education platforms that allow students to complete their work and teachers to implement content in a timely and efficient manner.

Use of Social Media in Curriculum Acquisition

With the implementation of technology into the classroom the use of social media to find materials has become more prevalent. Proliferations of online resources and an increase in accessibility had led teachers to go online to connect, share ideas and expand their professional learning (Prestridge, 2019). Not only are general education classroom teachers using social media even career and technical education teachers are turning to social medial for resources. In a 2020 study, White et al. found that agriculture education teachers were looking for a variety of factors when looking for quality online resources including, adaptability, interest, engagement of students and how the content relates to what they are teaching. Along with social media teacher blogs are becoming prevalent and teachers use blogs and social networking spaces to share their knowledge, connect with like-minded colleagues, and reach multiple audiences (Prestridge, 2019). The question remains, how have teachers' needs changed in a post-pandemic world?

Conceptual Understandings

The conceptual understanding for this study was developed from several frameworks including agriscience knowledge of teaching (AKT), Pedagogical Content Knowledge (PCK), Technological Pedagogical Content Knowledge (TPCK) and Agricultural Pedagogical Content Knowledge (APCK).

White et. al (2020) termed a concept Agri-Science Knowledge for Teaching (AKT). This encompasses the knowledge needed to effectively teach scientific agriculture, including an understanding of scientific processes and their application to agriculture. This framework suggests that effective teaching is a combination of curriculum and teacher knowledge. To help bridge the gap between available curriculums and teacher utilization of the available curriculums, the study reported here addressed how rural science and agricultural educators located and selected curricular resources, a first step in helping increase AKT through improving the efficiency of the curriculum knowledge of rural teachers (White et. Al, 2020).

Mulder (2017) found that Agricultural Pedagogical Content Knowledge (APCK) or the unique pedagogy required to teach agricultural content was important. Agriculture education is different from other content classes that teachers are required to teach. According to Mulder, it is important that agricultural and environmental education are "related to the survival of the human species, the challenge of growing global population, the natural environment, governmental issues, sustainability of production and consumption patterns, climate change, nutrition and health, ethical behavior and animal welfare. The unique combination of global issues called for a unique pedagogical and metacognitive knowledge" (Mulder, 2017). APCK is domain-specific knowledge about the design, implementation, theory and practice of learning agriculture education.

In recent years, Pedagogical Content Knowledge (PCK; Shulman, YEAR) has gained some prominence as a special amalgam of content and pedagogy that guides "ways of representing and formulating the subject that make it comprehensible to others" (Park & Chen, 2012, p. #). Park and Chen's PCK maps and patterns visualize how

content is integrated based of the connection between five different features, including knowledge of student understanding (KSU), knowledge of instructional strategies and representation (KISR), knowledge of science curriculum (KSC), knowledge of assessment (KA) and orientations toward teaching science (OTS; 2012). They found that even though teachers taught the same topics including using the same instructional materials and similar lesson plans, their individual maps differed.

Not only is their PCK found in agriculture, there is also a need for it to be related to the use of educational technology. Mishra and Koehler found that technology has dramatically changed the routines and practices in most arenas of human work (2006). In the world of technology, the understanding that teaching is highly complex activity that draws on many kinds of knowledge. This study created Technology Pedagogical Content Knowledge (TPCK), allows researchers to understand what effective teaching with technology is all about, but it also allows us to make predictions and inferences about contexts under which good teaching will occur (Mishra & Koehler, 2006). These four frameworks provided the conceptual understandings of this study.

Purpose and Objectives

The purpose of this study was to evaluate the way agriculture education instructors use and select content for curriculum development and implementation decisions. Knowing how agriculture education instructors implement and develop curriculum will help curriculum developers, education instructors and teachers create curriculum that is more conducive to learning.

The objective of this study includes the following:

1. Determine how South Dakota agriculture education instructors locate and develop content to create curriculum before, during and after the COVID19 pandemic.
2. Determine methods that South Dakota agriculture education instructors use to locate and evaluate resources while using social media or other internet resources.
3. Determine the implications of COVID19 and the positive and negative impacts it had on teaching styles of South Dakota agriculture education teachers.

CHAPTER II: MATERIAL AND METHODS

The primary purpose of this study is to empirically evaluate the usage of instructor materials by agricultural educators in South Dakota (n = 125). A survey was sent out in the fall of 2021 to all South Dakota agricultural educators with publicly available email addresses, inviting them to participate in an electronic survey designed to collect data related to demographics, curriculum and online preferences. The survey collected data over the course of a month with weekly emails reminding teachers about participation (Dillman et al., 2009). The final response rate from the survey was 56% (n = 70).

This descriptive study utilized a web-based survey instrument to collect data. Survey methodology was used to "produce statistics, that is, quantitative or numerical descriptions about some aspects of the study population" (Fowler, 2009, p. 1). Dillman et al. (2009), stated that electronic questionnaires face many difficulties with the general population, but they are well suited to targeted groups with "high internet access rates and skill levels, such as members of professional associations" (p. 9). Agricultural education instructors in South Dakota regularly correspond electronically and utilize the internet for a myriad of activities, including filing state reports, communicating with parents, accessing Idaho's state-approved curriculum, and as a result have high internet access and skill levels.

A questionnaire (see Appendix 1) was developed for the use of this study using individual Likert statements and open-ended qualitative questions designed to allow teachers to provide exploratory data related to their curriculum choices made through the

COVID epidemic. It is hoped that future research can utilize the qualitative data compiled here from the open-ended questions to form a reliable quantitative instrument for future studies. The first section of the survey included demographic information including community size, gender and grade levels taught. In the second section, teachers were asked to rate items based on degree of importance when selecting curriculum materials. The third section held open-ended questions concerning course delivery and curricular selection and the final section discussed topics including guest speakers, inquiry-based projects, and science fairs.

A pilot study was performed using the Dillman method. Dillman et al. (2009, p. 220) recommended the use of a small group of individuals with "specialized knowledge of some aspect of the questionnaire quality." These experts look at the questions to provide feedback on (p. 220):

- Whether questions measure the concepts that the surveyor intends to measure
- The potential for unintended question order effects
- Questions that should be asked but weren't
- Question structure and inappropriate response categories

This group of experts should represent a variety of people from fields of significantly different expertise (Dillman et al., 2009). The pilot study consisted of 20 agriculture education instructors from throughout the Midwest. After taking the study respondents were asked to provide feedback on the questions asked and changes were made based off the feedback given. Face validity was established by review of the instrument by one

Agricultural Education teacher ed faculty and one Biology Education teacher education faculty.

Utilizing Dillman's Tailored Design Method, South Dakota agriculture education teachers were contacted weekly after the initial contact. Each time the teachers were contacted they were sent new links to take the survey (Dillman et al., 2014). The final response rate for the study was 56% (n = 70).

CHAPTER III: RESULTS

Demographic Information:

The highest age group was 21-29 years of age, which was 39% (*n* = 25) of the respondents. Teachers ranging from ages 30-39 made up the second highest category with 29.6% (*n = 19*). Ages 40-49 made up 15.6% (*n = 10*) of the respondents. There were 35.9% (*n = 13*) of the teachers ages 50-59. Only three of the teachers surveyed, 4.7% (*n = 3*) were in the age range of 60-69. The lowest age range was 70 plus years (*n = 29.6*) of age, which had no responses.

Table 1

Age of Respondents

Age	Number of Respondents	Percent
21-29	25	39.0
30-39	19	29.6
40-49	10	15.6
50-59	13	35.9
60-69	3	4.7
70+	0	0.0

Note: n = 70

Females represented 65.6% (*n = 42*) of the respondents. While 43.8% (*n = 28*) were male. There was no one in the survey who responded with other or with not to respond.

Table 2

Sex of Respondents

Sex	Number of Respondents	Percent
Female	42	65.6
Male	28	43.8
Other	0	0.0
Wish not to respond	0	0.0

Note: n = 70

The majority, 65.6% (*n = 45*), of respondents reported earning a bachelor's degree in Agricultural Education. The next highest response group was alternatively certified educators which made up 28.1% (*n = 18*) of the respondents. There were nine respondents, 14.1% (*n = 9*), that reported earning a master's degree with one respondent, 1.5% (*n = 1*), that was emergency certified.

Table 3

Certification Pathway of Respondents

Certification	Number of Respondents	Percent
AgEd BS	42	65.6
AgEd MS	9	14.1
Alternatively Certified	18	28.1
Emergency Certified	1	1.5
Not Certified	0	0.0

Note: n = 70

The majority, 84.3% (*n = 54*), of respondents have a bachelor's degree. While 15 respondents, 23.4% (*n = 15*) , stated that they have a master's degree There was no one who took the survey that had a doctoral degree.

Table 4

Highest Degree Earned

Degree	Number of Respondents	Percent
Bachelor's Degree	54	84.3
Master's Degree	15	23.4
Doctoral Degree	0	0

Note: n = 70

The type of community in which each agriculture education teacher's school is in. A majority, 77.1% (*n = 54*) of the respondents live in rural/farming communities. Eight of the respondents, 11.5% (*n = 8*) live in rural non-farming communities, while the other eight, 11.5% (*n = 8*) were from urban communities.

Table 5

Size of Community

Size of School	Number of Respondents	Percent
Rural/Farming	54	77.1
Rural Non-Farming	8	11.5
Urban	8	11.5

Note: n = 70

Over half of the respondents, 57.8% (*n = 37*) are in their first ten years of teaching agriculture education. While 17.2% (*n = 11*) are in their 11 through 20 years of teaching. The agriculture education teachers with 25 years or more. They made up only 24.9% (*n = 16*) of the respondents.

Table 6

Years Teaching Agriculture Education

Years Teaching	Number of Respondents	Percent
1-5 years	21	32.8
6-10 years	16	25.0
11-15 years	7	10.9
16-20 years	4	6.3
25-30 years	9	14.0
30+ years	7	10.9

Note: n = 70

Teachers were asked to identify how long teachers had been teaching in their current positions. Half of the respondents had been in their current positions for five years or less. Fifteen respondents, 23.4% (*n = 15*), were in their sixth to tenth year teaching in their current position. There were three categories that had the same number of responses, with three in each category. They were as follows: 11-15 years, 16-20 years and 20-25 year with 4.7% (*n = 3*). Four respondents, 6.3% (*n = 4*) stated that they have been teaching in their position for 25-30 years and 7.8% (*n = 5*) had been teaching in their positions for over thirty years.

Table 7

Years in Current Position

Years	Number of Respondents	Percent
1-5 years	32	50.0
6-10 years	15	23.4
11-15 years	3	4.7
16-20 years	3	4.7
20-25 years	3	4.7
25-30 years	4	6.3
30+ years	5	7.8

Note: n = 70

Teachers were able to select multiple responses as many teach multiple grades. Most of the agriculture education teacher teach high school grades 9-12. While approximately half of the educators, 21.1% (*n = 65*) also teach middle schools courses to seventh and eighth graders

Table 8

Grades Taught

Years	Number of Respondents	Percent
7th Grade	26	8.3
8th Grade	39	12.5
9th Grade	61	19.5
10th Grade	61	19.5
11th Grade	61	19.5
12th Grade	61	19.5

Note: n = 70. Respondents were able to select multiple answers.

Research Question 1:

Research Question 1 was to determine how South Dakota agriculture education instructors locate and develop content to create curriculum before, during and after the COVID19 pandemic. The majority of respondents, 64 respondents reported using online groups such as; Agriculture Education Discussion Lab Facebook page and NAAE's Communities of Practice, 89.2% (*n = 58*). The second largest group was Google or YouTube with 43.8% (*n = 28*). The smallest group was using past resources with 0.1% (*n = 4*). The complete list of responses is located in Table 9.

Table 9

Where do teachers find curriculum?

Curriculum	Number of Respondents	Percent
Past Resources	4	0.1
Fellow Teachers	26	40.6
Online Groups		
Communities of Practice	24	36.9
Ag Ed Discussion Lab (Facebook)	34	52.3
Teachers Pay Teachers	18	27.7
Online Curriculum	18	27.7
Professional Development	12	18.7
Textbook/Journals	16	25.0
Google/YouTube	28	43.8

Note: n = 70. Respondents were able to select multiple answers.

South Dakota agriculture education teachers placed high importance on all of the curriculum development areas using a 7-point Anchored-Importance scale. The highest are with a mean score 5.7, indicated that teachers place high importance on their need to have the capacity to use and understand the curriculum. The next highest area was using the curriculum features are they were purposefully designed. This area had a mean score

of 5.27. Surprisingly, the lowest ae was the importance of national and state standards with a mean score of 4.22. The complete list of responses is located in Table 10.

Table 10

The importance of Curriculum Development for Agriculture Educators in SD

Construct Statements	*n*	*M*	*SD*
Teacher's relationship with and capacity to use curriculum	70	5.70	0.97
How important are state/national standards when selectin curriculum	64	4.22	1.44
Ways in which the chosen curricular resources influence instruction	64	5.11	0.93
Ways in which curriculum features are purposefully designed to achieve a certain purpose	64	5.27	1.10
Dissolution of boundaries between design and use of curriculum	64	4.28	1.15

Note: As measured on a 7-point Anchored- Importance Scale with 1 = "Least Important", and 7 = "Most Important "

Textbook resources were the highest area, 37% (*n = 37*) of pre-made curriculum that South Dakota agriculture educators use. One Less Thing Curriculum is also used by 21% (*n = 21*) of teachers and CASE (Curriculum for Agriculture Science Education) is used by 15% (*n = 15*) of teachers who responded to the survey. While there was 2% (n = 2) of the survey respondents who said they did not use pre-made curriculum at all. The complete list of responses is located in Table 11.

Table 11

Pre-Made Curriculum Used By Teachers in SD

Curriculum	Number of Respondents	Percent
CASE	15	15
One Less Thing	21	21
Textbook Resources	37	37
Teachers Pay Teacher	4	4
MyCEART	1	1
Cornell Vet Science	3	3
AgEd Net	4	4
ICEV	7	7
Project Lead the Way	1	1
Hobart Welding	1	1
Briggs and Stratton	1	1
None (No Pre-Made Curriculum)	2	2

Note: n =70. Respondents were able to select multiple answers.

Research Question 2:

Research Question 2 was to determine methods that South Dakota agriculture education instructors use to locate and evaluate resources while using social media or other internet resources. Respondents were asked how teachers evaluate curriculum for credibility. The state and national standards were cross-referenced the most for credibility with 32.8% (*n = 21*). The second largest group was the author or sponsor of the materials with 21.8% (*n = 14*). Seven teachers, 10.9% (*n = 7*), indicated that they do not evaluate sources for credibility. The complete list of responses is located in Table 12.

Table 12

How do teachers evaluate Curriculum for Credibility?

Sources	Number of Responses	Percent
Standards	21	32.8
Other Teachers	11	17.2
Sponsor/Author	14	21.8
Previous Knowledge	11	17.2
Never	7	10.9

Note: n =70

The majority of teachers, 25.71% (*n = 18*) responded that they use social media for educational purposes 2 to 3 times a month. While 22.86% (*n = 16*) never use social media for educational purposes. The lowest group response rate was daily at 4.29% (*n = 3*). The complete list of responses is located in Table 13.

Table 13

Rate of use of social media for Educational Purposes

Rate	Number of Respondents	Percent
Never	16	22.86
Once a Month	15	21.43
2-3 times/month	18	25.71
Once a week	13	18.57
Multiple times a day	5	7.14
Daily	3	4.29

Note: n =70. Sd = 1.4

Facebook was the highest social media application used for getting curriculum information. 53 teachers or 33.9% (*n* = 53) responded that they have used Facebook to help them find curriculum. Online learning communities such as NAAE Communities of Practice were used by 21.7% of teachers (*n = 34*). Instagram is used by 13.5% of teachers (*n = 21*) and Snapchat was used by 11.6% (*n = 18*). There are still some individuals, 0.3% (*n = 4*), who do not use social media to help them create curriculum. The complete list of responses is located in Table 14.

Table 14

Social Media Applications used by agriculture educators in SD

Sources	Number of Responses	Percent
Facebook	53	33.9
Twitter	7	4.5
Instagram	21	13.5
Snapchat	18	11.6
Blogs	9	7.2
Online Learning Communities	34	21.7
Tik Tok	2	2
Podcasts	1	0.1
Reddit	1	0.1
Pinterest	1	0.1
Streaming Services	1	0.1
None	4	0.3

Note: n =70, Respondents were able to select multiple responses.

Besides social media, one of the most common places to find curriculum is by asking fellow teachers, 7.4% of the respondents (*n = 26*) stated that they ask their fellow teaches for help with curriculum if they cannot find the sources. They, 8% of teachers, also will use google or YouTube to help search out the information (*n = 28*). Social media and collaboration platforms such as, NAAE Communities of Practice, Agriculture Education Discussion Lab and Teachers Pay Teachers, still make up the vast majority, 24% (*n = 84*) of places where teachers find their curriculum. The complete list of responses is located in Table 15.

Table 15

Common Places to find curriculum for agriculture educators in SD

Sources	Number of Responses	Percent
Past Resources	4	1.1
Fellow Teachers	26	7.4
Online Curriculum	18	5.1
COP/AGED/TPT	84	24
Professional Development	12	3.4
Textbook/Journals	16	4.5
Google/YouTube	28	8

Note: n =70. Respondents were able to select multiple responses.

Research Question 3:

Research Question 3 was to determine the implications of COVID19 and the positive and negative impacts it had on teaching styles of South Dakota agriculture education teachers. Teachers were asked of there was any positive impacts of COVID19 on their teaching style. A vast majority of the respondents, 52.8% (*n = 37*), agreed that they better understand the use of online resources. Four individuals, 5.7% (*n = 4*), stated that it helped them to create more diverse and creative lessons since they were not able to do some of the normal hands-on activities that typically are done in CTE classrooms. A few teachers, 4.2% *(n = 3*), did not see any positive impacts of COVID19 on their teaching style.

There were numerous responses about how the positives impact their curriculum. While COVID19 was a learning curve for all teachers one respondent stated, “After years of teaching, you get set in a way of presenting information. COVID caused me to look at different ways to present information/teaching style.” In another case, teachers adapted “I don't know if it was positive impacted me, but it made me more conscious of how I choose my curriculum. I tried to make sure it was something I could use if a student was in person or online. I also became much more efficient with Google Classroom and Microsoft Teams as I teach in 2 schools and they each choose to use these online platforms.” Some teachers even states that this COVID19 pandemic had no positive impacts at all, “It did not positively impact my teaching style.” A complete list of the positive impacts are summarized in Table 17.

Table 16

Positive impact of COVID19 on SD Agriculture Educators

Positive Impacts	Number of Respondents
Use of online resources	37
Diversity/creativity	4
Molding pre-made curriculum	1
Focusing on student	3
More understanding of student situations	2
Create boundaries/deadlines	1
Less is more	5
Adaptability	1
No Positives to COVID19	3

Note: n = 70

Teachers were then asked about the negative impacts that COVID19 had on their teaching styles. Communication and social interaction between teachers and students was the most stated negative impact of COVID19, 28 teachers commented that this made a significant negative impact in their teaching. Thirteen teachers stated that they were able to cover less material while they were online because they went at a slower pace. Five teachers stated that student behavior, ambition and motivation played a significant impact on their teaching style since the pandemic.

The negative impacts of COVID19 on teaching can still be seen and heard on news stories around the country. Some of the teachers in South Dakota stated, “It disrupted my planning routine and I'm having a really hard time getting back to the caliber of teaching I used to be at, especially since my students don't want to operate at that caliber anymore either.” Not only are teachers having a hard time returning to the

classroom, but students are also. Another negative of the COVID19 pandemic is that students may not like to technology as much as they did before, “The negative is that students are opposed to the online curriculum and do not like the usage of technology. I enjoy the tech side of it as it allows access to all the documents whenever and were ever I am. Students are not a fan as they don’t like the computers.” A complete summary list of the negative impacts are located in Table 18.

Table 17

Negatives of COVID19 on SD Agriculture Educators

Negative Impacts	Number of Respondents
Motivation/Ambition/Behavior	5
Social Interaction /Communication	28
Hands On	13
Less material covered	3
Rely on Technology	8
Students turned off to technology	2
Lowered Expectations	6
Not Vetting Resources	1
More planning requirements	3
No negative impacts	3

Note: n = 70

The majority of respondents said that they were unable to teach their typical hands-on labs and activities while completing online learning during the pandemic. Over 58.6% (*n = 41*) indicated that they were not able to do hands-on lesson like they were previously able to pre-pandemic. Twelve teachers, 17.1% (*n =12*) indicated that they were not able to teach their agricultural mechanics curriculum including construction, plumbing, structures and even welding.

A majority of respondents were able to teach hands-on labs and agricultural mechanics. One respondent said,

> The hands on mechanical side you can't recreate through a screen so that part students lost out on including small engine maintenance and repair, welding, plumbing etc.

While another teacher stated they were able to teach the curriculum it was not to caliber that they typically would,

> I taught all parts of my curriculum but not the way I would have liked. I still covered all the information, but I don't know if it was engaging as it would be if we were in person. We didn't do any projects or activities we would have done in person.

A summary list of the topics which teachers reported not being able to teach are found in Table 19.

Table 18

Curriculum that was not able to be taught during the COVID19 pandemic

Activities	Number of Respondents
Hands-on Labs	41
Internships	1
Ag Mechanics	12
Welding	5
Cooking	1
Greenhouse	3
Industry Visits	1
Microscopes	7
N/A	6

Note: n = 70

When asked how teachers engaged with students during the online learning process there was numerous responses. Six teachers, 8.5% (*n = 6*), indicated that they did not teach during online learning. Fourteen teachers, 20.0% (*n = 14*), indicated that they used zoom discussion to engage with students in conversation during online learning and ten teachers, 14.2% (*n =10*), had students create their own investigation projects.

One respondent stated that while they attempted to teach. Students were hard to engage while online,

> It was very difficult to keep them engaged. Most did not login to online classes and if they did, they were not engaging. I tried to have them work on projects in their homes.

Some felt like engagement was hard to achieve with students,

> I am not sure that anyone really did. We were only out of school for two months, in school we just did the best we could.

A summary of the ways teachers reported engaging with students is located in Table 20.

Table 19

How did you Engage Students in the Learning Process during COVID19

Sources	Number of Respondents
Engagement	6
Reinvent the wheel	1
Zoom Discussions	14
Flipgrid	1
Project Based Assignments	3
Google Classroom	
Phone/Email/Text	1
Own Investigation Projects	10
Choice Boards	1
OSHA/Online Certifications	2
YouTube Videos	2
Did not teach during COVID19	6

Note: n = 70

CHAPTER IV: DISCUSSION

Through this study we found that teachers are continually adapting and creating new materials and this process was further accelerated during the COVID19 pandemic. In the past years, teachers have used social media to work to help them find curriculum (White et. al, 2020). According to the respondents, the COVID19 pandemic has had both positive and negatives effects on both students, curriculum, and the teachers themselves. Teachers stated that technology is viewed as both negative and positive by students. Students have become more technology literate, but students have also become burnt out by the use of technology in classrooms.

The data of this study was collected using the Dillman method, a survey was sent out to the agriculture education teachers in the Fall of 2021 with weekly reminders. The survey was sent out for four weeks. The findings were collected the information was evaluated by the researcher and findings were represented.

The findings of this study are similar to that of frameworks, agriculture content pedagogical knowledge (ACPK), Agri-science knowledge for teaching (AKT), technological content pedagogical knowledge (TCPK) and content pedagogical knowledge (CPK).

The information in this study could be beneficial for students, preservice teachers, teacher educators and the profession. Agriculture is always changing and how that information is reported to students is essential for the agriculture education community to be mindful of. This knowledge can help teacher educators adapt and improve how the show preservice teachers to develop their own style to analyze, acquisition, creating curriculum in the future.

Respondents indicated that the most common place to find resources include online learning communities including NAAE Communities of Practice, Agriculture Education Discussion Lab and Teachers Pay Teachers. Teachers also used these online communities to help evaluate credibility of the resources. Along with checking the authors and sources the curriculum came from. However, with the COVID19 pandemic being on the forefront the consequences and significance of the pandemic's impact have yet to be determined. Also, in March of 2022, the NAAE discontinued its Communities of Practice program because of lack of use, according to NAAE. The implications of this closure and meeting the needs of agriculture educators are yet to be studied.

The population of this study specifically looked at agriculture education instructors in South Dakota. Further work needs to be done to study agriculture education instructors throughout the country. Further work needs to be done to examine how the COVID19 pandemic will have on agriculture education courses and in the future as the effects are still being determined. Also work needs to be done to research the effects of technology on student learning and hands-on activities that have taken place since the pandemic started.

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APPENDIX 1

Survey Instrument

1. What is your age?
    a. 21-29
    b. 30-39
    c. 40-49
    d. 50-59
    e. 60-69
    f. 70+
2. What is your sex?
    a. Male
    b. Female
    c. Other
    d. Wish not to Respond
3. What is your certification pathway?
    a. AgEd BS
    b. AgEd MS
    c. Alternatively Certified
    d. Emergency Certified
    e. Not Certified
4. What is the highest degree you have earned?
    a. Bachelors Degree
    b. Masters Degree

    c. Doctoral Degree

5. How would you classify the community in which your school is located?
    a. Rural/Farming Community
    b. Rural Non-Farming Community
    c. Urban Community
6. How many students are located in your school?
7. How many years have you been teaching?
8. How many years have you taught in your current position?
9. What grades do you teach (Select all that apply)?
    a. 7^{th} grade
    b. 8^{th} grade
    c. 9^{th} grade
    d. 10^{th} grade
    e. 11^{th} grade
    f. 12^{th} grade
10. What subjects are you certified to teach?
    a. Agriculture
    b. Science
    c. Other
11. Rate the following: (Least Important =1, Most Important =7)
    a. Teacher's relationship with and capacity to use curriculum
    b. How important are state/national standards when selecting curriculum?
    c. Ways in which the chosen curricular resources influence instruction

d. Ways in which curriculum features are purposefully designed to achieve a certain purpose

e. Dissolution of boundaries between design and use of curriculum

12. How often do you use social media for education purposes?

a. Never

b. Once a month

c. 2-3 times a month

d. Once a week

e. Multiple times a day

f. Daily

13. Which social media applications do you use?

a. Facebook

b. Twitter

c. Instagram

d. Snapchat

e. Blogs

f. Online Learning Communities

g. Other

14. What are the five most common places you go to find curriculum?

15. How do you evaluate an online curriculum resources for credibility?

16. Do you use any pre-made curriculum resources? If so, what do you use?

a. CASE

b. One Less Thing

c. Textbook Resources

d. Other

17. How did COVID19 pandemic positively impact your teaching style?
18. How did the COVID19 pandemic negatively impact your teaching style?
19. What part of your curriculum were you not able to teach through the COVID19 pandemic?
20. How were you able to keep students actively involved in the learning process through the COVID19 pandemic?
21. Anything else that you want us to know about our teaching style and your curriculum adaptations over the last two years?