

PREPARING TODAY’S CHILDREN FOR TOMORROW’S NEEDS: AGRICULTURAL EDUCATION IN AMERICA’S PUBLIC SCHOOLS

Kayli Paul†

I. Introduction.....	224
II. Origin of Agricultural Education	225
A. History of Agricultural Education in the United States	225
B. Federal Legislation in the Nineteenth Century	225
C. A Change in Agricultural Education.....	226
III. Current Agricultural Education Legislation and Statutes	227
A. Federal Statutes.....	227
B. State Statutes.....	228
C. Statutes and Legislation in Iowa	229
IV. Agricultural Education Structures	230
A. The Three-Component Model	230
B. Agricultural Education in Primary Schools	232
C. Agricultural Education in Secondary Schools	233
D. Agricultural Education in Urban Areas	234
1. Chicago	234
2. New York	235
V. Benefits of Agricultural Education.....	236
A. Personal Characteristics.....	237
B. Promoting the Economy	238
C. More than Just Farming	238
D. Students with Special Needs.....	239
VI. Integration of New Agricultural Education into Current School Systems ...	239
A. Including Agriculture in STEM Learning	240
B. Changing or Adapting Current Curriculum	240
VII. Challenges of Implementing Agricultural Education	241
A. Funding.....	241
B. Licensed Teachers.....	242
VIII. Conclusion.....	242

† J.D., Drake University Law School, 2020; B.S., University of Nebraska-Lincoln, 2017.

I. INTRODUCTION

Agricultural education in public schools has been a trend on the rise in America, especially in the Midwest. In fact, about one in five jobs in Iowa are somehow related to agriculture.¹ However, this does not mean that one in five students will grow up to work on a farm. Yet many students in Iowa will work in this vital and rapidly-changing industry.² Many aspects of our everyday lives stem from the agricultural industry. Agriculture is a way to connect students with their state by learning about present day, real-world scenarios. Agricultural education is a critical aspect of raising the next generation. We need to continue to build the next generation's interest in farming and agriculture while teaching them to adapt to modern practices.

While organizations, such as the National FFA Organization (FFA) and 4-H, are certainly exceptional resources for young students interested in farming and agriculture—this is a topic so beneficial to our society that it needs to be taught in schools and not just offered as optional organizations. Agricultural education is much more than education on farming. Agricultural education teaches young students subjects they already learn in school such as science, engineering, gardening, and nutrition.³ However, it also expands to learning outside of school subjects such as leadership and responsibility.⁴ Agriculture is one of the rare subjects that can be taught in a classroom while still readily preparing students to take on life after graduation.

This note will first discuss the origin of agricultural education in America. Exploring the background of agricultural education helps establish why this subject is important to teach our youth. Next, this note will discuss the current structure of agricultural education in America. It is important to understand the concept of agricultural education and recognize it is not a “one-size-fits-all” for each state. Each state should be allowed to choose curriculum tailored to agriculture in their respective state. Next, this note will look at the benefits provided by agricultural education to students in both primary and secondary schools. Then, this note will explore the different methods of integration of new agricultural curriculum into the current school structures. Finally, this note will focus on the challenges that may arise while implementing agricultural

1. *Agriculture in the Classroom, A History*, IOWA AGRIC. LITERACY FOUND. (June 14, 2017), <https://perma.cc/VP27-HSUK>.

2. *Id.*

3. Noelle Carver, *Importance of Teaching Agriculture to the Primary Schools*, THE CLASSROOM, <https://perma.cc/6KF9-8G4J> (archived Nov. 4, 2019).

4. *Id.*

curriculum and discuss potential solutions for those challenges. The overall benefit of agricultural education in America's primary and secondary schools greatly outweigh any initial challenges that may arise.

II. ORIGIN OF AGRICULTURAL EDUCATION

A. History of Agricultural Education in the United States

The concept of agricultural education and its importance was recognized by settlers before America was established as a country.⁵ Upon their arrival to America, the earliest settlers needed farming and agriculture to survive.⁶ In fact, the entire school calendar was based upon the farming schedule.⁷ The earliest forms of agricultural education were established at the beginning of the nineteenth century⁸ and its popularity took off rapidly throughout the remainder of the century.⁹

B. Federal Legislation in the Nineteenth Century

The year 1862 was an integral year for the development of agricultural education.¹⁰ First, Congress created the United States Department of Agriculture (USDA) for the purpose of gathering and distributing agricultural information.¹¹ Later that year, Congress passed the Morrill Act which proved to be crucial in the establishment of agricultural education.¹² The Morrill Act granted thirty thousand acres of land to each state for each member in their Congressional delegation.¹³ This land was then sold to the public and profits went to funding public colleges that focused on agriculture and mechanical arts.¹⁴

The Hatch Act of 1887 was established to provide agricultural

5. STEPHANIE MERCIER, FOOD AND AGRICULTURAL EDUCATION IN THE UNITED STATES 3 (July 2015), <http://perma.cc/9PCZ-D3MX>.

6. *Id.*

7. IOWA AGRIC. LITERACY FOUND., *supra* note 1.

8. MERCIER, *supra* note 5.

9. *Agricultural Education*, K12 ACADEMICS, <https://perma.cc/898E-YF2C> (archived Nov. 4, 2019).

10. *Id.*

11. *Id.*

12. *Id.*

13. *Primary Documents in American History*, LIBR. CONG., <https://perma.cc/53AK-G89N> (archived Nov. 4, 2019).

14. *Id.*

experimental stations through the use of federal funding.¹⁵ This Act provided the necessary funding for research studies that provided important information on the earliest scientific knowledge of farming, the environment, conservation of natural resources, and rural life.¹⁶ The Act is known for its “original investigations” into agricultural education.¹⁷

Continuing the push for agricultural education into the twentieth century, the Smith-Hughes Act was adopted into United States legislation in 1917.¹⁸ The Smith-Hughes Act provided funding to the states “for the purpose of promoting precollegiate vocational education in agricultural and industrial trades.”¹⁹ For the first time, local schools had the funding to teach an applied skill to their students.²⁰

C. A Change in Agricultural Education

Unfortunately, due to a large decline of the farming population beginning in the 1920s, the Smith-Hughes Act was unable to live up to the potential it once promised.²¹ All of the hard work in bringing agricultural education to schools was slowly beginning to diminish.²² Agriculture was now being taught as an “occupational specialty,” instead of a fundamental part of students’ lives.²³

However, in the 1960s and 1970s we began to see another change in agricultural education.²⁴ A small group of educators began to recognize the demand for proper agricultural education and the materials necessary to accomplish it.²⁵ Even more progress was made in 1981 when Secretary of Agriculture, John Block, invited agricultural educators and organizations to meet in Washington D.C. to discuss agricultural education.²⁶ From this meeting, an

15. K12 ACADEMICS, *supra* note 9.

16. The Hatch Act of 1887, 7 U.S.C. §§ 361a *et seq.* (2018); N.D. STATE UNIV. LIBRARY, THE HATCH ACT OF 1887, at 3-4, <https://perma.cc/XUJ9-PGHK> (archived Nov. 4, 2019).

17. N.D. STATE UNIV. LIBRARY, *supra* note 16.

18. Tracy L. Steffes, *Smith-Hughes Act*, ENCYCLOPEDIA BRITANNICA, <https://perma.cc/AQ87-C5F7> (archived Nov. 4, 2019).

19. *Id.*

20. See Katy Mumaw, *Smith-Hughes Act celebrates centennial*, FARM AND DAIRY (Oct. 18, 2017), <https://perma.cc/Q5LH-3BS4>.

21. IOWA AGRIC. LITERACY FOUND., *supra* note 1.

22. *Id.*

23. *Id.*

24. *Id.*

25. *Id.*

26. *Id.*

agricultural education task force was born.²⁷

The task force urged the USDA to be the coordinator for agricultural classroom literacy.²⁸ From that point on, the United States has seen substantial development “made through these partnerships of agriculture, business, education, government and dedicated volunteers.”²⁹ All state now have the benefit of addressing agricultural education in a way that is best suited to their respective needs.³⁰

Additionally, the adoption of year-long contracts for teachers proved to be an excellent resource in further developing agricultural education.³¹ Allowing educational programs to continue year round provided teachers the opportunity to supervise a student’s farm project throughout the summer, which is a time students are not usually in school, but is a critical time for farming.³² Not only was this beneficial for students because they were able to get hands-on education experience, it proved to be beneficial for educators as well by providing them with in-service workshops and conferences.³³

The ebb and flow of agricultural education throughout American history has certainly left its mark on the educational system. Help from federal funding and legislation has proven crucial in keeping the agricultural curriculum alive. However, it has also taken work from ambitious educators to keep the momentum going. Certainly, agricultural education has come a long way, yet it still has a long way to go.

III. CURRENT AGRICULTURAL EDUCATION LEGISLATION AND STATUTES

A. Federal Statutes

While agricultural education has not yet been mandated at the federal or state level, a few pieces of federal and state specific legislation have made steps in the right direction. The United States Code has created a food and agricultural

27. *Id.*

28. *Id.*

29. *Id.*

30. *Id.*

31. William G. Camp & John R. Crunkilton, *History of Agricultural Education in America: The Great Individuals and Events*, J. AM. ASS’N TEACHER EDUCATORS IN AGRIC., Summer 1985, at 57, 61.

32. *Id.*

33. *Id.*

service learning program.³⁴ The program takes a different approach to teaching agriculture than what comes to most peoples' minds. The program focuses on health and nutrition as one of the most important aspects of agricultural education.³⁵ The first purpose of this program is "to increase capacity for food, garden, and nutrition education within host organizations or entities and school cafeterias and in the classroom."³⁶ A second purpose of this program is "to carry out activities that advance the nutritional health of children and nutrition education in elementary schools."³⁷ Finally, this section of the code requires the Director of the National Institute of Food and Agriculture to administer food and agriculture service learning grants to "increase knowledge of agriculture and improve the nutritional health of children."³⁸

B. State Statutes

A few states have adapted their own statutes to begin the process of implementing agriculture in their public-school classrooms. While states are choosing to create an approach that works best for them, there are similarities between the statutes.

An Oklahoma statute states agricultural education programs are "designed for junior high and high school grades eight through twelve, and shall be provided by comprehensive school districts."³⁹ Following the design of the three-component model,⁴⁰ each student participating in an agricultural education program is required to participate in a supervised agricultural experience project.⁴¹ Further, school districts are required to provide transportation services to their students participating in agricultural education and FFA program related activities funded by the Oklahoma Department of Career and Technology Education.⁴²

Illinois has taken a slightly different approach than Oklahoma. Under Illinois Statute, agriculture is recognized as "the most basic and singularly

34. 7 U.S.C. § 7633 (2018).

35. *Id.*

36. *Id.* at (b)(1).

37. *Id.* at (b)(4).

38. *Id.* at (a).

39. OKLA. STAT. ANN. tit. 70, § 14-108.2(A) (2018).

40. *Supra* Section IV. A.

41. tit. 70, § 14-108.2(B).

42. *Id.* at (C).

important industry in the State.”⁴³ The General Assembly of the State of Illinois found it to be “in the best interests of the people of the State of Illinois that a comprehensive education program in agriculture be created and maintained by the State’s public school system in order to ensure an adequate supply of trained and skilled individuals”⁴⁴ The intent of the General Assembly is that part of the curriculum for both primary and secondary schools will include a state program for agricultural education.⁴⁵

C. Statutes and Legislation in Iowa

Iowa has taken a different approach from both Illinois and Oklahoma, though it is similar to Oklahoma. Unlike Illinois, Iowa is still using permissive language in their statutes. The intent of Iowa’s General Assembly is to encourage public secondary schools to develop comprehensive programs for agricultural education.⁴⁶ These comprehensive programs should meet the diverse needs of Iowa’s students.⁴⁷ “The board of directors of each public school district may develop, as part of the curriculum in grades nine through twelve, programs for career and technical education in agriculture technology.”⁴⁸

Further, some states, including Iowa, have created special committees for their agricultural education programs.⁴⁹ In Iowa, this council is composed of nine individuals who are nominated by the governor.⁵⁰ The council is diverse and made up of people with different background knowledge.⁵¹ “The duties of the council are to review, develop, and recommend standards for secondary and postsecondary agricultural education.”⁵² Annually, the council issues its recommendations for the curricular standards of agricultural education.⁵³

Last year’s report published by the council showed the council made recommendations for Iowa to apply new standards to agricultural education programs.⁵⁴ The council recommends Iowa uses the National Quality Program

43. 105 ILL. COMP. STAT. ANN. 5/2-3.80(a) (2018).

44. *Id.*

45. *Id.*

46. IOWA CODE § 280.20(1) (2018).

47. *Id.*

48. *Id.*

49. IOWA CODE § 256.32 (2018).

50. *Id.* at (1).

51. *See id.* at (1)(a)-(c).

52. *Id.* at (3).

53. *Id.*

54. *Council Recommends New Program Standards in Agricultural Education, IOWA*

Standards for Agriculture, Food, and Natural Resource Education.⁵⁵ These standards are designed to help state programs analyze what they are currently doing and assists in creating goals for program growth.⁵⁶ Chairman of the council, Will Fett, said, “This set of standards will provide guidance and direction for continued improvement and growth of agricultural programs here in Iowa.”⁵⁷

IV. AGRICULTURAL EDUCATION STRUCTURES

A. *The Three-Component Model*

One of the most common structures of agricultural education currently involves the interdependent relationship between three distinct concepts: classroom and laboratory instruction, supervised agricultural experience, and agricultural youth organization participation.⁵⁸ The three components have different titles used by different regions and school districts; however, the concept of each component is essentially the same.⁵⁹ The combination of these three components have helped students establish an interest in agriculture ultimately leading to a continuation of agricultural education after high school.⁶⁰

The classroom and laboratory instruction gives students insight into a variety of subject areas including environmental science, agribusiness, natural resources, aquaculture, food science and safety, animal and plant sciences, entrepreneurship,⁶¹ agricultural mechanics, horticulture, and agricultural production and biotechnology.⁶² Students are able to take core concepts learned in these common subject areas and apply an agriculturally related perspective.⁶³ These lessons are presented to students using traditional methods such as lecture, demonstration, research, and assessment.⁶⁴ With classroom and laboratory

AGRIC. LITERACY FOUND. (Jan. 4, 2019), <https://perma.cc/P87T-QB3N>.

55. *Id.*

56. *Id.*

57. *Id.*

58. D. Barry Croom, *The Development of the Integrated Three-Component Model of Agricultural Education*, 49 N.C. ST. U. J. OF AGRIC. EDUC. 110, 110 (2008).

59. NAT'L ASS'N OF AGRIC. EDUCATORS, DISCOVER THE POSSIBILITIES OF AGRICULTURAL EDUCATION 1, <https://perma.cc/XW46-FN6R> (archived Nov. 4, 2019).

60. *Id.*

61. *Id.*

62. Croom, *supra* note 58.

63. NAT'L ASS'N OF AGRIC. EDUCATORS, *supra* note 59.

64. Croom, *supra* note 58.

instruction, students are gaining “real-world experiences that enhance college and career readiness.”⁶⁵

The Supervised Agricultural Experience (SAE), sometimes referred to as experiential learning, is an independent learning program for students taking agricultural education courses.⁶⁶ This program is designed for students to learn outside of the classroom⁶⁷ while directing them toward a career of their choice.⁶⁸ The SAE is a chance for students to apply what they learn in the classroom to real-world practices.⁶⁹ Students have several different opportunities for experience in an SAE program: owning and operating their own business; working at a business, farm, or organization; or engaging in their own research projects under the supervision of an employer, teacher, or parent.⁷⁰ The skills students perfect while working on an SAE project range from employability techniques and industry skills, to responsibility and organization.⁷¹

The third concept of this model is agricultural youth organization participation.⁷² Organization participation is often seen as a hybrid between the first two concepts because it combines both instructional learning with supervised experimental learning.⁷³ The FFA, Postsecondary Agricultural Student Organization (PAS) and National Young Farmer Education Association (NYFEA) are different student organizations that fit the third component.⁷⁴ In this concept of the model, students are gaining leadership skills as well as personal development skills.⁷⁵ Programs activities include individual member awards programs,⁷⁶ and career development events a wide range of ears including public speaking contests, agriculture sales and marketing, and livestock judging.⁷⁷ Proficiency contests also serve as a means of recognizing student efforts in their SAEs.⁷⁸ Finally, the organizations are a great opportunity for

65. NAT'L ASS'N OF AGRIC. EDUCATORS, *supra* note 59.

66. Croom, *supra* note 58.

67. NAT'L ASS'N OF AGRIC. EDUCATORS, *supra* note 59, at 2.

68. *Id.*; Croom, *supra* note 58.

69. Croom, *supra* note 58.

70. NAT'L ASS'N OF AGRIC. EDUCATORS, *supra* note 59, at 2.

71. *Id.*

72. Croom, *supra* note 58.

73. *Id.*

74. NAT'L ASS'N OF AGRIC. EDUCATORS, *supra* note 59, at 2.

75. *Id.*

76. Croom, *supra* note 58, at 110-11.

77. NAT'L ASS'N OF AGRIC. EDUCATORS, *supra* note 59, at 2.

78. *Id.*

student members to give back to their communities while learning and working on their projects.⁷⁹

However, this three-component model does not appear to be working flawlessly. Studies have shown the largest issue with this program stems from the lack of direction and goals that can be measured from the SAE programs.⁸⁰ It seems as though there is too much discrepancy between the way the programs are run, and the lack of common standards for assessing the quality of the programs.⁸¹ Additionally, because participation in the agricultural youth organizations is not required, studies have shown there is a significant discrepancy between the number of students enrolled in classroom agricultural education programs and the number of students enrolled in the youth organizations.⁸² A study by the FFA reported that there are almost 200,000 students enrolled in agricultural education programs that are not enrolled in the FFA youth organization.⁸³ Without all three components of this model working, it is hard to ensure students are receiving the full benefit of agricultural education.

B. Agricultural Education in Primary Schools

Research has shown there is currently a large number of students enrolled in agricultural education programs at both the secondary and collegiate level.⁸⁴ However, the same cannot be said for primary schools. There is very limited, if any, federal funding allocated to agricultural literacy in primary schools. However there are significantly more funds available to secondary schools.⁸⁵ Additionally, because this curriculum is not required to be taught, very little guidance or regulation exists for teachers if they choose to teach agriculture.⁸⁶ Teachers in public elementary schools typically have a stricter curriculum and focus on teaching subjects that will be on standardized tests.⁸⁷ Most students in primary schools are only introduced to agriculture as a sliver of a complex

79. *Id.*

80. Croom, *supra* note 58, at 111.

81. *Id.*

82. *Id.*

83. *Id.*

84. MERCIER, *supra* note 5, at 5.

85. DAVID L. HOWELL ET AL., ELEMENTS OF THE STRUCTURE OF AGRICULTURAL EDUCATION IN THE UNITED STATES OF AMERICA 27 (1983), <https://perma.cc/C89D-3GN8>.

86. *Id.*

87. MERCIER, *supra* note 5, at 7.

science course.⁸⁸

When asked why agriculture was not being taught in their classroom, a 2007 research study in Illinois showed teachers did not believe agriculture should be taught in their classroom because it was not “appropriate for their situation, because it took time away from preparing students for state proficiency tests, or they did not have access to good instructional resources on the subject.”⁸⁹ Yet, even the teachers who were incorporating agriculture into their classrooms had concerns about finding proper curriculum on agricultural-related projects.⁹⁰

Implementing more agriculture in the classroom is not as challenging as it seems. The National Agriculture in the Classroom website provides hundreds of lesson plans for teachers of all grade levels.⁹¹ The free online source is a great tool for teachers looking to add introductory agricultural education to subject areas they are already teaching such as science, health, and social studies.⁹² The benefits of adding this curriculum to primary schools are endless. For example, by simply creating a small classroom garden, students are learning skills such as motivation, responsibility, and the basic agricultural skills of planting and caring for crops.⁹³

C. Agricultural Education in Secondary Schools

Agriculture has been taught as an elective course in secondary schools for some time now.⁹⁴ But, these education programs are beginning to become more common throughout high schools across the United States.⁹⁵ Several high school programs use the FFA organization to help improve agricultural learning in the classroom.⁹⁶ Secondary schools have reaped the benefits of having federal

88. *Id.*

89. *Id.*

90. *Id.*

91. Vanae Morris & Debra Spielmaher, *National Agricultural Literacy Curriculum Matrix*, NAT'L AGRIC. IN THE CLASSROOM, <https://perma.cc/GUG4-KJEP> (archived Nov. 4, 2019).

92. *Id.*

93. Tara Sad, *The Importance of Agricultural Education in Schools*, COUNCIL OF STATE GOV'TS (Dec. 15, 2017), <https://perma.cc/6L24-C6TS>.

94. HOWELL ET AL., *supra* note 85, at 18.

95. Alexandra Pannoni, *Agriculture Education Blooms in Urban, Rural High Schools*, U.S. NEWS & WORLD REPORT (Mar. 31, 2014), <https://perma.cc/2GZE-W5UN>.

96. *Teaching Agriculture*, NAT'L ASS'N AGRIC. EDUCATORS, <https://perma.cc/GHQ6-UBS7> (archived Nov. 4, 2019).

funding to help support and grow their agricultural education programs.⁹⁷

As discussed previously, each state is equipped to tackle agricultural education in a way that best suits them. For example, a high school in Texas is teaching its students about aquaponics by raising catfish, while a high school in Oregon is teaching its students practical gardening, business, and cooking skills.⁹⁸ One of the unique aspects of teaching agriculture is there are thousands of different ways it can be taught. These methods usually involve students gaining more than just classroom knowledge.

The most important thing to keep in mind is students are still accomplishing their typical high school requirements. Whether teaching animal science or agribusiness, students are still learning the basic concepts of math and science.⁹⁹ However, these classes are being taught as separate electives in most schools, rather than as part of the curriculum in core high school classes.¹⁰⁰ With strict government regulated standardized testing, it proves to be a challenge for students to add these electives into their schedules.¹⁰¹ If agriculture was taught hand in hand with the core classes, or as a mandatory class, this would eliminate the challenge of squeezing everything into four short years.

D. Agricultural Education in Urban Areas

1. Chicago

While it is true that most agricultural education programs are in small towns and rural areas, more and more urban areas are seeing a breakthrough in agricultural education programs as well.¹⁰² One of the earliest examples of an urban agricultural education program dates back over thirty years.¹⁰³ In July 1984, the Chicago Board of Education created the Chicago High School for Agricultural Sciences and it welcomed its first class in September 1985.¹⁰⁴ The school was established at a time when keeping agricultural education programs

97. See HOWELL ET AL., *supra* note 85, at 28.

98. AJ Hughes, *7 American High Schools Embracing Sustainable Farming in the Classroom*, SEEDSTOCK (June 9, 2015), <https://perma.cc/EK5W-CUXK>.

99. Amanda Radke, *Does your local school support agricultural education?*, BEEF DAILY (Sept. 28, 2015), <https://perma.cc/5NJE-7XL7>.

100. *Id.*

101. *Id.*

102. MERCIER, *supra* note 5, at 1.

103. *Id.* at 5.

104. *School History & Overview*, CHI. HIGH SCH. AGRIC. SCI., <https://perma.cc/AP4A-9ZEF> (archived Nov. 4, 2019).

alive was critical.¹⁰⁵

This unique school takes place on a working farm¹⁰⁶ and offers all of the standard core classes, as well as classes focused specifically on agriculture such as “animal science, agricultural mechanics, food sciences, horticultural and landscape design, and agricultural finance.”¹⁰⁷ The farm is equipped with well-resourced laboratories and facilities to ensure students have access to real-world tools and the opportunity to apply what they are learning.¹⁰⁸ Even with stricter graduation requirements, the school’s graduation rate is nineteen points above the school district average.¹⁰⁹

In addition to normal classroom exams, teachers created skills based performance exams to make sure students can perform what the curriculum requires.¹¹⁰ Additionally, students create an in-depth portfolio portraying all of the work they have done throughout their high school career.¹¹¹ Further, every student is a member of the FFA to ensure they can take what they are learning in school and apply it to outside organizations as well.¹¹² Students are encouraged to attend local agricultural conferences, engage in job shadowing and internships, enroll in summer programs and research apprenticeships, and run service projects in their local community.¹¹³ Again, this demonstrates the large amount of hands on work that comes with attending such a unique school.¹¹⁴ This school has proven itself time and time again as a matchless combination of in class studies with real-world career preparation.¹¹⁵

2. *New York*

While not being solely dedicated to agriculture like the Chicago High School for Agricultural Sciences, John Browne High School is the only school in New York City to have a dedicated agricultural education department.¹¹⁶

105. *Id.*

106. Valerie Strauss, *Down on the farm, these Chicago high school students get a unique public education*, WASH. POST (Apr. 25, 2018), <https://perma.cc/K3N4-K646>.

107. MERCIER, *supra* note 5, at 5.

108. Strauss, *supra* note 106.

109. *Id.*

110. *Id.*

111. *Id.*

112. *Id.*

113. *Id.*

114. *Id.*

115. *Id.*

116. Steven Blackburn, *Agriculture education grows in the city*, DIST. ADMIN. (Feb. 10,

Although farming is not particularly prevalent in urban schools within New York City, John Browne High School still offers traditional farming education to its students.¹¹⁷

John Browne High School has several different opportunities for students to get involved with agriculture.¹¹⁸ First, they offer a summer program for their freshman and sophomore students.¹¹⁹ This program enables students to spend half their day in the classroom studying and half the day working on the land lab.¹²⁰ The land lab requires students to tend to school crops and work in the poultry house, green house, orchard, and in the animal lab or barn.¹²¹ Next, they offer a program for their upper level students that takes place on farms throughout the state.¹²² These farms can include anything from a vegetable farm to a goat farm, and students are placed according to their specific interests.¹²³ Finally, students are offered a plethora of urban internships at places such as veterinary hospitals, florist shops, zoos, and aquariums.¹²⁴

Not only are the programs at John Browne High School and Chicago High School for Agricultural Sciences, notably both public high schools, unique for the country as a whole—they are unique based upon their urban locations. These urban schools simply demonstrates that agriculture is a key aspect to learning for every student, no matter where they live. No matter the region, no matter the career—there is always a unique tie to agriculture.

V. BENEFITS OF AGRICULTURAL EDUCATION

The benefits of providing agricultural education in the classroom seem endless. According to the Executive Director of the National Association of Agricultural Educators, Jay Jackman, not only does agricultural education introduce students to many career opportunities in the agricultural field, “agricultural classes allow students to practice real applications of math, science and English concepts.”¹²⁵ Agricultural education is great for students who learn

2017), <https://perma.cc/9LNA-HWPQ>.

117. *Id.*

118. *Id.*

119. Justin Davey, *Top-Notch Ag Education Program in the Middle of New York City*, SUCCESSFUL FARMING (Jan. 10, 2019), <https://perma.cc/TRX6-D3AN>.

120. *Id.*

121. *Id.*

122. Blackburn, *supra* note 116.

123. Davey, *supra* note 119.

124. Blackburn, *supra* note 116.

125. Pannoni, *supra* note 95.

better in a hands-on setting.¹²⁶ “You put them in an agriculture class and you teach them photosynthesis, for example, in the context of agricultural crops and the science becomes real to them,” Jackman says.¹²⁷

Agricultural education provides teachers the opportunity to teach young students how things grow, live, and die.¹²⁸ Introducing these basic concepts allows children to learn how the food comes from the ground to their table, how clothes do not just come from stores, and how seeds germinate.¹²⁹ Introducing agriculture at a young age opens children’s eyes to a whole new world.¹³⁰

A. Personal Characteristics

Responsibility tops the list as one of the most important character traits taught along with agricultural education.¹³¹ The Association of Career and Technical Education stated, “[C]ritical thinking, adaptability, problem solving, oral and written communications, collaboration and teamwork, creativity, responsibility, professionalism, ethics, and technology use [are] skills needed in the 21st century.”¹³²

Further, agricultural education promotes the concept of meaningful learning. Meaningful learning is defined as the progression learners make when they begin to stray away from low-level learning techniques such as memorization, and move toward higher-level learning techniques such as interpretation and analysis.¹³³ Meaningful learning engages students in the process of learning, not just the end result, a skill rarely seen due to the prominent demand of standardized testing in public schools.¹³⁴

126. *Id.*

127. *Id.*

128. Carver, *supra* note 3.

129. *Id.*

130. *Id.*

131. Jacqui Lockaby & Paul Vaughn, *Teaching Values in Agricultural Education*, 40 TEX. TECH U. J. AGRIC. EDUC. 74, 77 (1999), <https://perma.cc/JA49-9K7F>.

132. AMERICAN ASSOCIATION FOR AGRICULTURAL EDUCATION NATIONAL RESEARCH AGENDA 32 (T.G. Roberts et al. eds., 2016), <https://perma.cc/8M2M-7244>.

133. *Id.*

134. *Id.*

B. Promoting the Economy

Agriculture is a large part of everyone's everyday lives whether they know it or not. From the food we eat to the gas we fill our cars with, agriculture is everywhere. The future of agriculture and the way it affects our everyday life is in the hands of students today. This is just one of the many reasons why it is critical that we get students excited to learn about agriculture and provide them with the resources necessary to further that education.

With technology changing and developing faster than ever, it only makes sense to teach students how to learn, adapt, and grow with these changes. For example, farm equipment is rapidly changing to provide farmers with easier ways to tend to their crops.¹³⁵ The best place to start is in the classroom.

C. More than Just Farming

According to the USDA, teaching agriculture in schools is much more than teaching students about farming.¹³⁶ The Agriculture in the Classroom Program relates topics such as science, nutrition, and pre-service and professional development opportunities for teachers.¹³⁷

Agriculture combines all different varieties of science into one hands-on learning experience.¹³⁸ Educators can take chemistry, biology, and physics and show students how corn is turned into oil, which is turned into gas, which is put into cars, which is how most of the students probably arrived at school that morning.¹³⁹ Showing students how one small vegetable can have so many different uses is just one of the benefits to agricultural education.

One of the most successful ways of teaching agriculture in a hands-on environment has been with the use of school gardens.¹⁴⁰ School gardens have helped students develop personally and socially.¹⁴¹ Additionally, it teaches students about responsibility and caring for living things.¹⁴² Finally, it teaches

135. Tanja Folnovic, *Technologies Changing Agriculture*, AGRIVI, <https://perma.cc/Y66L-EQW4> (archived Nov. 4, 2019).

136. *Agriculture in the Classroom (AITC) Program*, USDA, <https://perma.cc/EM59-2SUJ> (archived Nov. 4, 2019) [hereinafter *Agriculture in the Classroom (AITC) Program*].

137. *Id.*

138. Carver, *supra* note 3.

139. *Id.*

140. C.D. Klemmer et al., *Growing Minds: The Effect of a School Gardening Program on the Science Achievement of Elementary Students*, 15 HORTTECHNOLOGY 448, 452 (2005).

141. Carver, *supra* note 3.

142. Klemmer et al., *supra* note 140.

students about the natural life cycle of living things: growing, living, and dying.¹⁴³

D. Students with Special Needs

One of the newer purposes of agricultural education is to serve students with special needs.¹⁴⁴ Studies have proven that “comprehensive secondary agriculture programs that utilize the classroom, supervised agricultural experience, and the FFA model, provide a positive learning environment for students with special needs.”¹⁴⁵ Almost 60% of students with special needs have taken career and technical education classes.¹⁴⁶

There are countless benefits of teaching agriculture to students with special needs. Agriculture helps special needs students improve their social skills.¹⁴⁷ Courses, such as horticulture, work the best for students with special needs because they are applying skills and interests they possess.¹⁴⁸ “[S]tudents with special needs benefited from career and technical education because the hands on activities in these courses that engage the students in the curriculum and allow students to practice skills that help them transition to employment.”¹⁴⁹ However, teaching agricultural education to special needs students does not exclusively benefit those students. Inclusive learning provides benefits to traditional students, such as developing leadership and citizenship skills as well.¹⁵⁰

VI. INTEGRATION OF NEW AGRICULTURAL EDUCATION INTO CURRENT SCHOOL SYSTEMS

When educators first think of adding agricultural education into their classroom, they immediately think it means long, stressful hours of changing their curriculum, an increase in funds needed to make it happen, and various

143. Carver, *supra* note 3.

144. Gary Moore, *The Blind Man, the Elephant, and Agricultural Education*, AGRIC. EDUC. MAGAZINE, July-Aug. 2004, at 4, <https://perma.cc/E2D7-ZR5L>.

145. ASPEN M. PIRTLE, AN EXPLORATION OF AGRICULTURAL EDUCATION AS AN EFFECTIVE TOOL FOR DEVELOPING STUDENTS WITH SPECIAL NEEDS ii (2012), <https://perma.cc/GQ2N-QHAK>.

146. Jodie Moffitt, *Agricultural Education...EOE?*, AGRIC. EDUC. MAG., July-Aug. 2004, at 13, <https://perma.cc/E2D7-ZR5L>.

147. PIRTLE, *supra* note 145, at 4.

148. *Id.* at 25.

149. R. G. Easterly III & Brian E. Meyers, *Inquiry-Based Instruction for Students with Special Needs in School Based Agricultural Education*, 52 J. AGRIC. EDUC. 36, 37 (2011).

150. PIRTLE, *supra* note 145, at 11.

other challenges. However, this simply is not true. Researchers have already found several cost-effective ways to add agricultural education programs.¹⁵¹ Because educators are likely already teaching agriculture to some degree, it takes relatively minor changes within existing curriculum to bring agricultural education to a whole new level in schools.

A. Including Agriculture in STEM Learning

Science, technology, engineering, and mathematics (STEM) education has widely expanded throughout education programs and schools in the United States.¹⁵² Little do many educators know, STEM programs and agricultural education go hand in hand.¹⁵³ Agriculture could be taught in science classes discussing growth of plants through farming or in a biology class when talking about farm animals.¹⁵⁴ However, agriculture could also be taught in engineering courses when discussing how to design and build farm equipment, or simply improving upon current farm equipment.¹⁵⁵

When STEM education was initially being researched, developers considered expanding STEM to science, technology, engineering, agriculture, and mathematics (STEAM).¹⁵⁶ However, at that time agricultural education was not as accessible as it currently is.¹⁵⁷ With education programs today, it would be a simple additions to a curriculum to take agriculture a step further.

B. Changing or Adapting Current Curriculum

The perceived challenge of bringing agriculture into the classroom is not proving to be much of a challenge at all. The internet and various organizations have an abundance of resources for schools and educators to use for free to adapt their current curriculum to the ever-demanding needs of agricultural education.¹⁵⁸

151. *K-12 and Higher Education Programs*, USDA, <https://perma.cc/J8MB-KECC> (archived Nov. 4, 2019).

152. Grace Chen, *The Rising Popularity of STEM: A Crossroads in Public Education or a Passing Trend?*, PUB. SCH. REV., <https://perma.cc/2CFY-TWA9> (archived Nov. 4, 2019).

153. Navindra Persaud, *Boosting K-12 Agriculture Education & Its Relation to STEM*, EDUC. WORLD, <https://perma.cc/Q59G-B7BX> (archived Nov. 4, 2019).

154. *Id.*

155. *Id.*

156. Eric A. Stubbs and Brian E. Myers, *Multiple Case Study of STEM in School-based Agricultural Education*, 56 J. OF AGRIC. EDUC. 188, 188-89 (2015).

157. *Id.*

158. *Supporting Ag At Your School*, USDA, <https://perma.cc/2HGW-ZASH> (archived Nov. 4, 2019).

Additionally, local 4-H and FFA programs also provide development programs for educators interested in adding agriculture to their classroom.¹⁵⁹

As previously noted, teachers would not have to rewrite their entire curriculum. They can simply add to it, or spend a little more time focusing on agriculture, to make sure that children better understand how agriculture impacts their everyday lives.¹⁶⁰

VII. CHALLENGES OF IMPLEMENTING AGRICULTURAL EDUCATION

While the idea of adding agricultural education to every classroom in America seems great, with change comes challenges. Many schools across America are concerned with the lack of funding available for their schools currently and adding additional programs appears to be additional stress. Further, schools are worried about not having the proper staff to teach agriculture to their students.¹⁶¹ Many schools are worried it would require new training and education for their current teachers, or they would have to hire a new teacher for an agricultural program—which relates to the stress of funding again.¹⁶² However, there are several solutions to these challenges.

A. Funding

Funding seems to be the challenge most schools are facing when attempting to implement agricultural education programs. In a time where funding for education is already tight, it does not appear schools have any additional funds to spend on a new program. Educators are worried about the cost of purchasing new curriculum and the potential costs of hiring new staff.¹⁶³

However, what many educators are not aware of is the large amount of grants available for adding agricultural education programs to the classroom.¹⁶⁴ The grants are both publicly and privately funded because there are several individuals who realize the importance of learning agriculture at a young age.¹⁶⁵ Grant availability typically varies from state to state. Some states, such as Illinois, have learned how important agricultural education is in the classroom,

159. *Id.*

160. Persaud, *supra* note 153.

161. Harry N. Boone, Jr. & Deborah A. Boone, *Problems Faced by High School Agricultural Education Teachers*, 48 W. VA. U. J. AGRIC. EDUC. 36, 36 (2007).

162. *See id.*

163. *See K-12 and Higher Education Programs*, *supra* note 151.

164. *See id.*

165. *Id.*

and have funds set aside for those specific programs to grow and develop.¹⁶⁶

B. Licensed Teachers

The shortage of teachers is something the American education system has faced for a period of time now, and agricultural education teachers are not immune from that shortage.¹⁶⁷ “During the 2014-2015 academic school year, there was a deficit of more than 400 agriculture teachers.”¹⁶⁸ There are a variety of causes for this shortage such as older teachers retiring, expansion of programs, and agricultural education graduates accepting a position other than teaching.¹⁶⁹

However, programs such as the National Teach Ag Campaign are popping up to help curb the shortage of educators in this specific field.¹⁷⁰ The program launched in 2009, and has been working to bring “awareness of the need to recruit and retain quality and diverse agriculture teachers” ever since.¹⁷¹ Great improvements have been made since the initial launch of this campaign and it appears that each year efforts like the National Teach Ag Campaign are voiding the shortage a little at a time.¹⁷²

VIII. CONCLUSION

Agricultural education programs are something the American education system has seen off and on since settlers first arrived.¹⁷³ Educators have continued to realize the importance and the benefits of adding agricultural education to our school systems. More people are beginning to realize agricultural education is much more than teaching children about farming.¹⁷⁴ Students learn about things impacting their everyday lives, such as how the food they are eating got on the table and how the clothes they are wearing got in their closets.¹⁷⁵

166. ILL. STATE BD OF EDUC., AGRICULTURAL EDUCATION INCENTIVE FUNDING GRANT, 2 (Aug. 2017), <https://perma.cc/LQ2W-6GT7>.

167. Boone & Boone, *supra* note 161, at 36.

168. NAT’L TEACH AG CAMPAIGN, FORWARD PROGRESS: SOLVING THE AGRICULTURE TEACHER SHORTAGE 1 (2014), <https://perma.cc/ZJV9-B6CW>.

169. *Id.*

170. *Id.*

171. *Id.*

172. *Id.*

173. MERCIER, *supra* note 5, at 3.

174. *Agriculture in the Classroom (AITC) Program*, *supra* note 136.

175. *Id.*

2020]

Agricultural Education

243

While outside organizations prove to be an excellent resource for the agricultural industry, providing children with these opportunities in school is a way to ensure all children are receiving the benefits of agricultural education. Researchers have continued to develop different models of curriculum to ensure students are applying agriculture to topics they are already learning in school.¹⁷⁶

Adding agricultural education programs to schools may at first appear to bring challenges to school systems such as lack of funding and availability of teachers. However, the government has begun several campaigns to gain more teachers in agriculture, as well as providing several funding options for school districts to utilize.¹⁷⁷ The benefits of adding agricultural education to the classroom greatly outweigh any challenges. We need to continue to build the next generation's interest in farming and agriculture, while teaching them to adapt to modern practices.

176. Croom, *supra* note 58, at 110.

177. *K-12 and Higher Education Programs*, *supra* note 151.