

**Urban Agricultural Event**

**A Project and Report**

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## **Background**

Many authors and researchers agree that our youth will benefit from learning about agriculture. “Agricultural literacy is an essential factor for continuing success of the nation. It is important to reach the population when it is most vulnerable and susceptible to learning; this consists of the children of today’s world” (Schmidbauer, Pastor, & Elliot, 2004; p. 2). Ryan and Lockaby suggest that if the population possesses an understanding of agriculture, they are more likely to benefit society because they will be informed and can make decisions based upon that knowledge (Ryan & Lockaby, 1996). The current mission of agricultural education is to prepare and support individuals for careers, build awareness and develop leadership for the food, fiber, and natural resource systems to accurately articulate the vision of the future of agriculture (Case & Whitaker, 1998). Agricultural education takes into account basic agricultural methods, vocabulary and terms, and the ability to understand the impact of agriculture on society. In essence, agricultural education in local schools plays an important role in youth development as it produces capable, knowledgeable, and contributing citizens (Case & Whitaker, 1998). An Urban Agriculture Day (UAD) program, conducted by Virginia Cooperative Extension (VCE), was directed towards the 5<sup>th</sup> grade students of the Lynchburg City Schools (LCS). This report examines a program which educated the youth with hands on learning about agriculture of Virginia and other subjects which fulfilled several requirements of the Virginia Standards of Learning (SOL) testing. Specifically, using diffusion of innovation theory (Rogers, 2003) as a framework, how do teachers perceive the relative advantage, compatibility, complexity, triability, and observability of Urban Ag Day for the teaching of SOLs.

## **Introduction**

Trexler and Suvedi (1998) have suggested, based on their field work with elementary and middle school teachers, that assistance should be provided to develop teachers' capacity to infuse agricultural concepts into curriculum (Trexler & Suvedi, 1998). Therefore, this program also supported the participating 5<sup>th</sup> grade teachers in helping supplement their instruction in the classroom. Teachers garnered new ideas on how to influence their instruction with hands on learning and/or agriculture from this program.

According to the Virginia Department of Education, Virginia's accountability system sets rigorous academic standards, known as the Standards of Learning (SOL), and measures achievement through annual SOL tests and alternative and alternate assessments. The system provides schools, school divisions and the Virginia Department of Education with critical data to inform the development and implementation of effective instructional strategies and best practices. SOL assessments measure student achievement in English, mathematics, science and history/social science. Students are assessed annually in English and mathematics in grades 3 through 8 and at the conclusion of certain high school-level courses. SOL tests in science and history are administered in grades 3, 5 and 8 and at the end of high school-level courses in these subjects (Virginia Department of Education, 2011; par. 3).

The SOLs are essentially a way for the Virginia Department of Education to monitor the outlines and objectives that the schools are teaching by the grades. The SOLs are also very important for the schools themselves because the testing results have implications upon the School Performance Report Card. Based on the United States Department of State, the Report Card is used for determining whether or not the schools attain or retain their accreditation status, whether they receive funding/resources, and can even impact the real estate for families looking to relocate near a school that has been performing well (Family Liaison Office, 2011). However,

public school teachers in Virginia are expected to teach specific concepts as required by the Virginia Standards of Learning (SOL) and quickly move on to the next topic.

There is additional knowledge that teachers are not allowed to elaborate on in depth, due to the constraints set by the SOL objectives and the time allowed to complete them. This leaves the youth with no chance to explore things that they find fascinating or to ensure that the students grasp the concepts taught. These aforementioned educational constraints often leave teachers hurting to find hands on learning to educate the youth. The hands on learning approach in education assists in the assumption that UAD is an important and valuable program to assist teachers with this dilemma and to effectively teach about agriculture.

Many youth in urban settings think of agriculture as farms or animals that they see on television or on the roads travelling to and from Lynchburg where they might notice pastures or crops growing. Because of this lack of understanding, it is often difficult to explain that milk comes from a cow or wool comes from a sheep when there are no hands on learning with a dairy cow or a sheep. Pertaining to a study between rural and urban students perceptions of agriculture, the urban students knew much less than the rural students regarding agriculture and it was concluded that “persons who reside in larger cities and metropolitan areas would expectedly have fewer opportunities to interact with farmers and individuals employed in agricultural businesses. Therefore, educational programs should be provided in larger population centers to meet the educational needs of those residents regarding agriculture, food, and natural resources” (Frick, Birkenholz, Gardener, & Machtmes, 1995; p. 8). It is also suggested that elementary teachers “should be encouraged to develop a greater understanding of the importance and significance of agriculture in this country and the world” within their classrooms (Frick, Birkenholz, Gardener, & Machtmes, 1995; p. 8). Students in an agricultural community such as

Amelia County, which is one of Virginia's top ten of agricultural counties (United States Department of Agriculture, 2007), know a lot more about agricultural education compared to the students in the City of Lynchburg because of their constant interaction with agriculture and it being predominant in their local environment. There are five schools in Lynchburg where teachers are assisted with 4-H horticultural programming which are conducted by the Lynchburg VCE office through its Master Gardener volunteers, the Hill City Master Gardener Association, but these are only for the 4<sup>th</sup> grade students of those selected schools. Subsequently, SOL testing is required to be conducted for the 5<sup>th</sup> grade students using what they learned in both 4<sup>th</sup> and 5<sup>th</sup> grades.

Several schools fell below the accepting threshold for their results in SOL testing. These schools which did not meet their goals were given two options for the students: 1) to attend another school which scored adequately within Lynchburg or 2) to remain in the current school and improve. This information led to the design and the implementation of an Urban Agriculture Day for all eleven of the LCS to strengthen the education of SOL testing components for their students. These eleven LCS schools were the target audience for UAD participation. This program assisted fifth grade teachers in teaching and reinforcing the Virginia SOLs utilizing agriculture as a teaching method. It also reinforced common knowledge about agriculture, specifically Virginia agriculture. The day consisted of several stations that were SOL based in design; the participating youth traveled to these stations in small groups. The students and teachers participated in several aspects of Virginia agriculture which incorporated hands on learning of key elements in the SOLs that the students are required to learn and are tested upon. Ideally, the lessons which they participated in covered the following: science, mathematics, history, social studies, English, nutrition and physical education. As an end result, there was

knowledge gained by the students which motivated them to improve their overall SOL scores<sup>1</sup> and the teachers gained information about how to incorporate Virginia agriculture into their classroom as it relates to the Virginia SOLs 4<sup>th</sup> and 5<sup>th</sup> grade educational components. These SOL objectives can be described as 1) Scientific Investigation, 2) Force, Motion, Energy, and Matter, 3) Life Processes and Living Systems, and 4) Earth/Space Systems and Cycles, More importantly, however, this program assisted the teachers with their responsibilities of SOL educational components.

The UAD concept was presented to the Lynchburg City School Superintendent and was supported. Following the meeting with the Superintendent, a presentation of the components of the UAD was presented to the Principals of the Lynchburg City Elementary Schools as a way to utilize agriculture within the classroom to teach the facets of the SOLs. The Principals agreed that the utilization of agriculture within this UAD will direct more attention to bringing it into the classroom. The teachers of the 5<sup>th</sup> grade students who participated in this event were with their students and saw firsthand several educational opportunities and lessons which they can modify within their instruction.

### **Problem Statement**

According to the Lynchburg City School Administration, there were a few Lynchburg elementary schools who did not meet their goals set upon them in regards to student testing based on the previous school year. As a whole, the entire Lynchburg elementary schools' SOL scores were in the low to mid 80's in the areas of English, Writing, Mathematics, and Science on a scale of 0 to 100 points. The state of Virginia did not make their Adequate Yearly Progress (AYP) goals, scoring between 87 and 89 points. Likewise, Lynchburg fell short of the state bar,

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<sup>1</sup> The SOL scores for each school are not available for several months after they take the test. Therefore these results are neither tangible, nor available at the time of this report.

therefore not making their AYP goals (Commonwealth of Virginia Department of Education, 2011). It may be possible that UAD will help these teachers improve SOL scores by utilizing agriculture as a relevant context for student learning. **Figure 1** is a table with the SOL testing results for the 5<sup>th</sup> grade from all of the Lynchburg City Schools.

**Figure 1**

<b>Grade 5 English Reading Pass Rate 2010-2011 All Students</b>	<b>Grade 5 Mathematics Pass Rate 2010-2011 All Students</b>	<b>Grade 5 Science Pass Rate 2010-2011 All Student</b>	<b>Grade 5 Writing Pass Rate 2010-2011 All Students</b>
86	84	83	84

In the rural areas outside of Lynchburg, and across the state, there are FFA chapters and agricultural education; however, the two high schools in Lynchburg City do not have agriculture education programs or FFA chapters. This limits to what the school focus is in the elementary schools and secondary schools because of that vacancy of agricultural education. Until recently, there were no 4-H in-school enrichment programs throughout any of the elementary schools (there were youth horticultural education programs conducted by the Lynchburg VCE office in only five schools).

The United States Department of Agriculture, through the Agriculture in the Classroom, supports the improvement of “agricultural literacy — awareness, knowledge, and appreciation — among Pre K-12 teachers and their students” (Agriculture, par. 1). Agriculture in the Classroom is not uncommon, yet due to some form or another, it is not a curriculum utilized within the Lynchburg City Schools. While the obvious void in youth education in Lynchburg is the absence of the utilization of agriculture to teach common educational standards, the goal was to demonstrate to the teachers that they can witness and learn how to teach proven methods that incorporate SOL standards. This innovation hoped to lead to enhanced lessons and knowledge

about agriculture and core areas for both the students and teachers. It was also the hope that the UAD made possible not only the better understanding of agriculture, but better teaching methods in the classroom; to educate not only students of the Lynchburg City Schools, but for the 5<sup>th</sup> grade teachers too.

The utilization of agricultural literacy to teach the SOLs was a driving force of the UAD. However, getting the UAD adopted as a program for the future and for the teachers to utilize within their classroom was the ultimate goal. The UAD was a new innovation for the 5<sup>th</sup> grade teachers in Lynchburg because it had never been done in this particular format. The Diffusion of Innovation theory was utilized to provide theoretical underpinning to how UAD was perceived by these teachers in order to observe the process of diffusion (communication among the members participating within their social system) and whether this innovation was to be adopted or rejected.

### **Purpose and Objectives**

In light of the previous information provided, the purpose of this report is to examine how an urban agriculture field day may benefit the 5<sup>th</sup> grade teachers in their ability to educate the SOL components in subjects as it relates to agriculture. Specifically, this report will address the question: How did 5<sup>th</sup> grade teachers in Lynchburg perceive the characteristics of UAD for reinforcement of SOL components? The target audience will be the 5<sup>th</sup> grade teachers of the elementary LCS.

### **Data and Analysis**

Teachers who participated by bringing 5<sup>th</sup> graders to UAD answered questions indicating their perceptions of participating in UAD; that is, how UAD is perceived with respect to relative advantage, compatibility, complexity, trialability, and observability. Descriptive statistics were

used to analyze demographic information of these teachers. Through interviews, qualitative data were collected and indicated how the teachers identified the usefulness of this program and recognized personal opportunities in which the UAD could positively impact their instruction within the classroom.

### **Limitations of the Study**

In regards to this report it is recognized that there may be limits within. Because these teachers were self-selected into UAD as participants, and qualitative data were collected to specifically address the characteristics of this UAD program, findings were not generalizable to other UAD type programs, or other teachers outside of this group of participants. However, much may be learned from this group of teachers for improving the adoption of UAD by other 5<sup>th</sup> grade teachers in the future. Subsequently, it is also important to recognize that knowledge acquired during UAD may be already previously learned in the classroom setting; therefore one may not be able to completely attribute SOL score increases to this UAD program. The elementary schools which participated have never participated in an educational event such as this one, whereas schools in rural settings have. The UAD was designed to work with the schedule of the schools, but because of it being scheduled near the end of the school year the ability for programmatic events to occur often meets resistance. This resistance is often caused by Spring Break, end of the school year events, and forthcoming SOL testing in which teachers and schools will be focusing on reviewing as much as they can of the SOLs to prepare the student for testing. The resources available are dependent upon volunteer schedules and accessibility.

## **Significance**

The UAD, while common in rural communities in and around Virginia, is a new educational enrichment idea in Lynchburg. It is an innovative program; the UAD is purposely showing new methods and ideas to the teachers to incorporate into their classroom. The utilization of the ideas and methods demonstrated by the UAD into the classroom is part of the process of its adoption or, if the techniques are not incorporated, it's rejection. Ideally, the innovation will spread throughout the population to which it affects thereby causing an innovation diffusion or the diffusion of innovation. In the case of the UAD, the diffusion of innovation theory suggests that following the UAD's conception, the innovation will spread throughout the entire 5<sup>th</sup> grade classrooms of the Lynchburg City Schools if it is successful. Once the hands on teaching methods and ideas adopted as a part of their in class instruction, more knowledge of agriculture will be taught to the students while incorporating the standards of the SOLs.

Research findings support the claim that the integration of science and agriculture is a more successful way to teach science. Students taught by incorporating agriculture and scientific principles demonstrated a more successful achievement than did students taught by traditional approaches (Chiasson & Burnett, 2001). One example of how the UAD reinforced the educational elements required by the SOLs for 5<sup>th</sup> graders would be the utilization of a station to encompass financial management, math, healthy eating and life processes. This station simulates a community market in which the youth will be able to purchase fruits and vegetables with 'play' money while learning about how different types of fruits and vegetables are grown and how it helps the body.

The utilization of hands on learning incorporates youth's different learning styles. Conducting this experiential type of learning enables them to remember certain and key activities / lessons which are presented to them, which the teachers will observe. Utilizing agriculture in a 'hands on' method to teach science makes it possible for youth to retain many of the educational principles taught in the UAD. "Children in [the] concrete operational stage need to touch and manipulate concrete material in order to get mental impressions of abstract ideas. In order to sustain their newly acquired knowledge there must be repetition which, provided by hands-on science, gives opportunities for reinforcement" (Shaikh, 2006; p. 3 ). Youth were crawling through a soil tunnel and creating erosion and runoff, coming in contact with animals that produce many common foods and tools: dairy cow – milk, cheese; pig – bacon, pork; sheep – lanolin, wool, meat; learning about the history of agriculture of Virginia by simulating common agricultural practices; and ultimately learning life skills. With the youth's participation in these types of activities they are able to retain not only the agricultural components, but they will also learn and be able to reinforce the educational requirements necessary to improve scores on their SOL tests. The UAD will serve as an "instructional approach... to reinforce student learning of science principles" (Osborne, 1993, p. 3). Due to experiential learning being infused with agricultural education and reinforcing of the SOL requirements, it was important that the urban 5<sup>th</sup> grade students be able to not only learn about Virginia agriculture and the mandatory sections of the 5<sup>th</sup> grade SOL requirements, but also improve their overall knowledge.

"Urban agriculture may function as an important strategy for poverty alleviation and social integration ... [by] providing recreational opportunities for citizens (recreational routes, food buying and meals on the farm, visiting facilities) or having educational functions (bringing youth in contact with animals, teaching about ecology, etc.)" (RUA Foundation, 2011; par. 25).

Exposing these students to agriculture in addition to them being educated to assist them with their SOL testing was vital to the future of local agriculture. Students in grades six and up usually have “shaped their perceptions about agriculture” and that it “may be best to target new efforts at children in the fourth, fifth and sixth grades” (Holz-Clause & Jost, 1995). This understanding of agriculture is important to urban youth in particular because they are the ones that do not see its importance day in and day out. After learning about agriculture, the youth will hopefully learn more about their community, food security and availability, environmental stewardship and to provide an important potential setting for youth development, in addition to reinforcing their SOL testing preparation. Building upon the reinforcement of the youth development with the 5<sup>th</sup> graders, the teachers can build on the significance and educational aspects of the UAD and adopt the educational components into the classroom. This reinforcement of agriculture literacy and hands on learning in the classroom is the catalyst of the overall success of the UAD and the driving force of its aftermath.

### **Review of Literature**

According to the 2010 United States Census, over 79% of Americans live in urban areas. Subsequently, the need for urban agriculture education, starting with the youth is essential. It is imperative to have a vital urban presence because it is “important and right to do so” (Office of Planning, Environment, & Realty (HEP); Panshin, 1992) and the youth are our next leaders in our community. Urban youth in Lynchburg have the opportunity to learn more educationally and to learn more life skills and citizenship.

Moving towards the new generation and staying abreast of the way America is mobilizing economically and residential is imperative as the past 75 years has been precedence. The transfer of youth from living in rural areas to urban areas is increasing, but with that swell,

the level of understanding for agriculture, urban agriculture, reduces. This was a huge opportunity to reclaim those youth and to educate new youth with what Virginia's agricultural history is all about through Lynchburg 4-H and Lynchburg VCE. Along with VCE, "the 4-H program is committed to serving all youth within a community" (Van Horn, Flanagan, & Thomson, 1999). The Lynchburg 4-H program has been expanding of late into all of the Lynchburg elementary schools and raising awareness about youth development and agricultural education which is central in an urban community. There have been multiple 4-H Day Camps at Lynchburg Grows, and urban agricultural center and the host of the UAD, and learning about the environment, natural resources, and local agriculture were highlights for the youth participants. 4-H is substantial in the learning process because it incorporates the "Learning by Doing" slogan; experiential learning that is vital in teaching youth. 4-H is virtually new in Lynchburg, but it definitely belongs and can assist in the education in Lynchburg youth. It is suggested that if "the 4-H program wants to be force in the future, it needs to be progressive and adaptive to new trends and ideas, reaching youth from all cultures, races, ethnic groups and income levels" (Van Horn, Flanagan, & Thomson, 1999; par. 20). Therefore, the UAD definitely assisted the Lynchburg Extension office in accomplishing the outreach education and fulfill the Virginia Cooperative Extension mission of improving people's lives through an educational process that uses scientific knowledge focused on issues and needs (Extension).

The UAD focused on SOL components that are necessary per the 5<sup>th</sup> grade teachers. The stations focused on the objectives determined by the teachers, but also used agriculture as a focal point to teach math, science, social studies and language arts. The stations also provided school teachers with hands on training and materials to integrate agriculture to supplement their lesson plans which are focused around the SOLs.

The UAD served as the innovative approach to teaching the SOLs utilizing agriculture as its main element. There was, however, hesitancy that there may not be utilization of the UAD methods. The school administration was eager for their schools to participate in an event such as this. Early in the planning process there was a possibility that there may be teachers whom may be reluctant to ‘buy in’ to a program such as this or attempt the types of programs shown within their classrooms. Once the data was identified and tabulated, all of the teachers were very supportive.

The Diffusion of Innovations (DOI) as it pertains to the UAD examined the teachers’ perception of change and cause to reinvent the process in which they teach as it pertains to integrating agriculture into their curriculum. In DOI it is not people who change, but the perceptions of the innovations (Robinson, 2009). There are five characteristics that influence the accomplishment of an innovation. The DOI theory as it pertains to the UAD focused on the potential adopters (the teachers) perception of the UAD’s (innovation) characteristics. The characteristics include:

1. Relative Advantage – the degree to which an innovation is perceived better than the idea it supersedes. In relation to the UAD, the greater the perceived relative advantage is, the higher the possibility of the rate of adoption.
2. Compatibility – The degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. In regards to the UAD, if the teachers thought of the ideas as contradictory to their values, norms or practices, then the idea will not be adoptable easily.

3. Simplicity – the degree to which an innovation is perceived as difficult to understand and use. If the teachers were able to understand the ideas and believe that the innovations and ideas will be understood by the students more rapidly then it is a much higher probability rate of its acceptance.
4. Trialability – the degree to which an innovation may be experimented with on a limited basis. Because of the multiple trials being represented with the UAD the teachers will be less uncertain of the innovation.
5. Observability – the degree to which the results of an innovation are visible to others. Throughout the UAD, the teachers witnessed to the students’ understanding of the SOL objectives. If the results were visible, then the likelihood of the event being accepted increases and also stimulates discussion between peers (Rogers, 2003).

Ultimately, research studies confirm that an innovation which is perceived as having high compatibility, relative advantage, trialability and observability while having low complexity is more likely to be adopted. The decision to adopt or reject the foundation of the UAD can occur three ways:

1. Optional – Each 5<sup>th</sup> grade teacher in the Lynchburg City School system could adopt or reject the innovation.
2. Collective – the schools could make a consensus-based decision on whether to adopt or reject the idea of changing the norm in the 5<sup>th</sup> grade classroom or not.
3. Authority – the Lynchburg City School Administration, by its authority, could choose adoption or rejection and it is the expectation that the schools will follow that directive.

Based on the DOI, if adopted, the teachers' reinvention of components taught during the UAD in the next school year will show that the program was not only acceptable, but also was able to evolve to meet the needs of the teachers, students, schools, etc.

### **Population and Sample**

The population for this study included 5<sup>th</sup> grade teachers who participated in the Lynchburg UAD. The sample included five of these teachers, selected randomly, who answered specific interview questions regarding their perceptions of UAD as an intervention to improve academic learning. The teachers were contacted through electronic communication (e-mail) to participate in the research to determine the effectiveness of the Urban Agriculture Day and discover the adoptability of this educational innovation.

### **Procedures for Project**

The priorities of the program are exposure, education, and partnerships. Exposure refers to the teacher's exposure to different teaching methods, the student's exposure to Virginia agriculture, and Virginia Cooperative Extension's exposure to the community. Education is the cornerstone of the entire program. VCE's main objective in any program is to educate.

In planning and designing this event, several discussions were made with local organizations, administrators, VCE, and volunteers. Specifically, they included the following:

- Lynchburg Grows (a local urban farm which educates individuals in sustainability)
- The Lynchburg City Schools Superintendent and principals of all eleven elementary schools as well as the 5<sup>th</sup> grade teachers of the aforementioned eleven schools
- The Hill City Master Gardeners Association (150 volunteers in the Lynchburg VCE office)

- The Lynchburg Parks and Recreation Department Director (the Parks and Rec. own a 5 acre piece of land neighboring Lynchburg Grows)
- The VCE Agriculture and Natural Resources Extension Agents of my planning district in Central Virginia
- The local Soil & Water Conservation District
- Members of the NA-YGN (North American Young Generation in Nuclear) of AREVA in Lynchburg
- The Nature Zone in Lynchburg (using live animals to educate youth)

The Director of the Lynchburg Parks and Recreation Department suggested many ideas which led to the site to house the event. This site was adjacent to Lynchburg Grows. The property, The Allen-Morrison field, was zoned and seeded in early 2011. At the time when the event was to begin, the property was filled in nicely with fescue and clover and was ideal for the UAD as well as other events, programs, and the public. At this time, the Director also noted that this would be a nice event for Lynchburg and that it would be a great program the community could embrace as it not only educated Lynchburg's youth, but also had the potential to bring together several organizations to work together collaboratively. Through many conversations, new partnerships were developed with the VCE office and the Nature Zone's Director and Lynchburg Grows.

The Urban Agricultural Day was implemented successfully and there were also opportunities to improve and draw upon by the potential impacts that may evolve from the program. Evaluations for this report served as a process of reflection so to speak, which essentially determines the worth and value of the program. All aspects were assessed in order to determine the value and the potential impacts.

A teacher survey instrument was developed and distributed at the beginning of the UAD and collected afterwards. For this instrument, a simple tool was developed to assess the agricultural knowledge of teachers based on the Standards of Learning and whether they would reinforce those standards using agriculture and/or improve the agricultural literacy of their students before and after the UAD. For the second portion, five teachers were selected randomly out of the participating group of teachers and were asked to take part in an interview. This interview was developed to collect data about gender, experience as an educator, innovative teaching methods, academic preparation, experience in teaching, and the Diffusion of Innovation stages in regards to the UAD.

The teachers were selected and contacted via email and all of the participants were informed of the purpose of the study: to examine how an urban agriculture program may benefit the 5th grade teachers in their ability to educate the Virginia Standards of Learning (SOL) components in subjects as it relates to agriculture. All of the interviews were kept strictly confidential and the participants were assigned pseudonyms. The meetings were scheduled based on their preferences and all were held at their respective elementary school throughout the school day. The interviews were recorded using a voice recorder and then transcribed by each question. The data obtained was analyzed and recorded for this report on Excel as it relates to the Diffusion of Innovation and the UAD.

### **Findings**

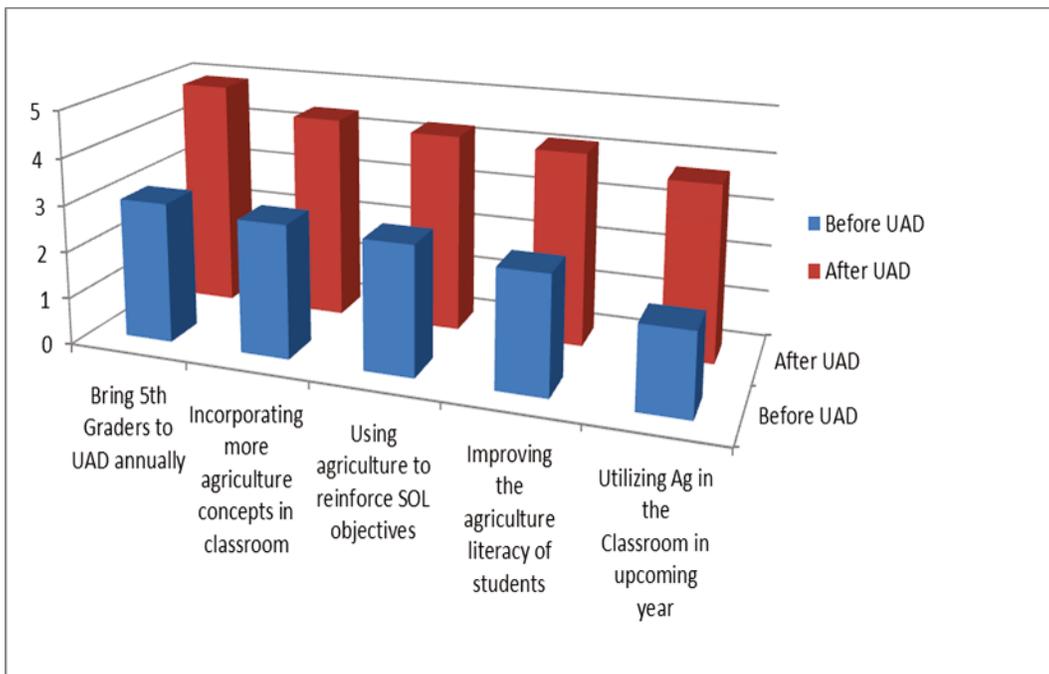
Eight of the eleven elementary schools participated in the UAD (Two schools had prior commitments and one school was in an intersession). The teachers, once arrived, were given an evaluation survey to capture personal data regarding their experiences before the UAD attitudes and knowledge and after the UAD. This instrument given to the teachers arriving at the UAD

with their students did not capture demographic data, but it did allow for opportunities to comment throughout the UAD. In regards to this survey, there were 5 main questions in a post-then format to identify intentions of behavioral change in relation to the teacher’s perceptions. After UAD was held, the teachers ( $n = 8$ ) were asked to estimate their level of ability by circling one of the following statements using a scale of 1—5, with 1 being disagree and 5 being agree with respect to their intentions before and after the event

1. Bring 5th graders to the Urban Agriculture Day annually.
2. Incorporating more agriculture concepts in the classroom.
3. Using agriculture concepts to reinforce SOL objectives.
4. Improving the agricultural literacy of my students.
5. Utilizing Farm Bureau’s Ag in the Classroom plans in the next school year.

Below, Figure 2 illustrates the teachers’ intentions to adopt certain methods in the future.

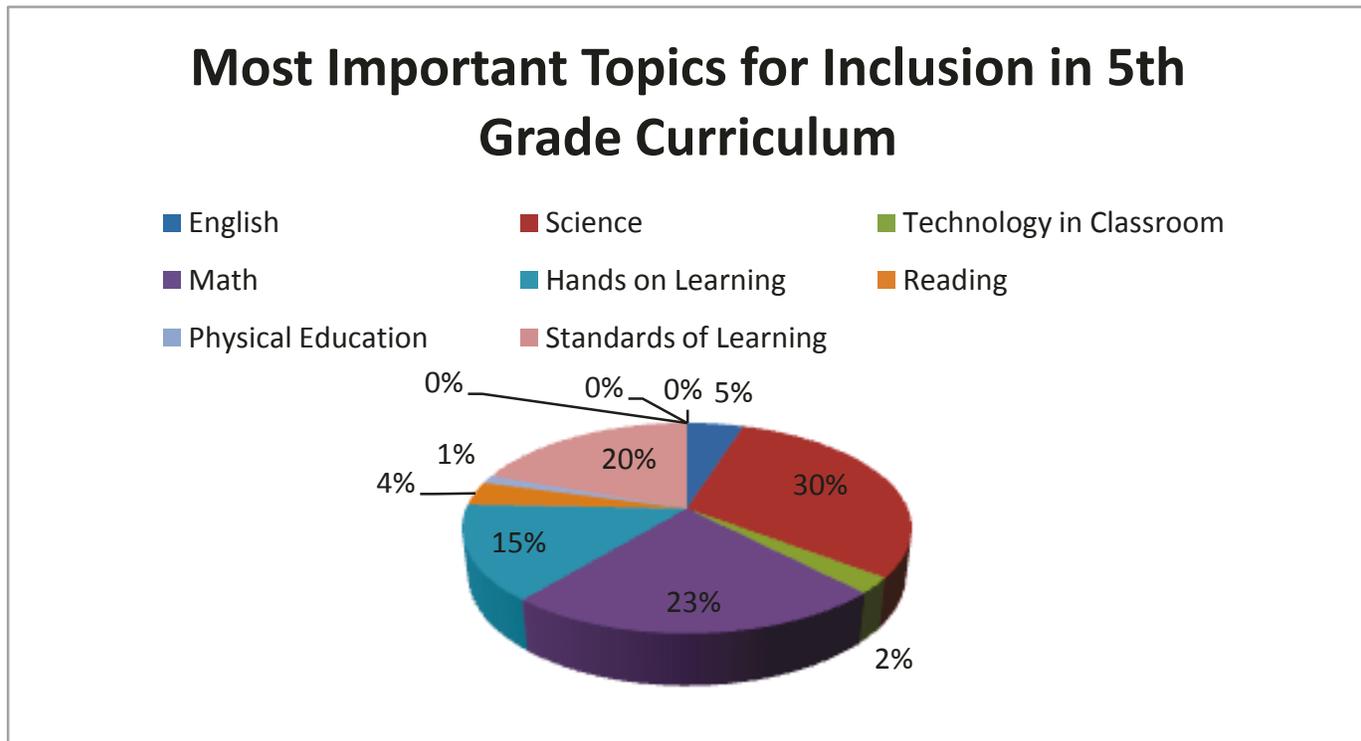
**Figure 2**



In the days that followed the UAD, there were five teachers selected randomly for the interview. The individuals that were selected were 5<sup>th</sup> grade teachers who attended the Urban Agriculture Day. The teachers' careers in their elementary schools ranged from 2 years to 27 years, yet all of them had an average of a five year increase to their career term in regards to being an educator. All of the teachers had obtained Master of Education. Three of the five teachers taught science and math whereas the other two taught all subjects; all of the teachers had participated in extra-curricular projects at one time or another with the students.

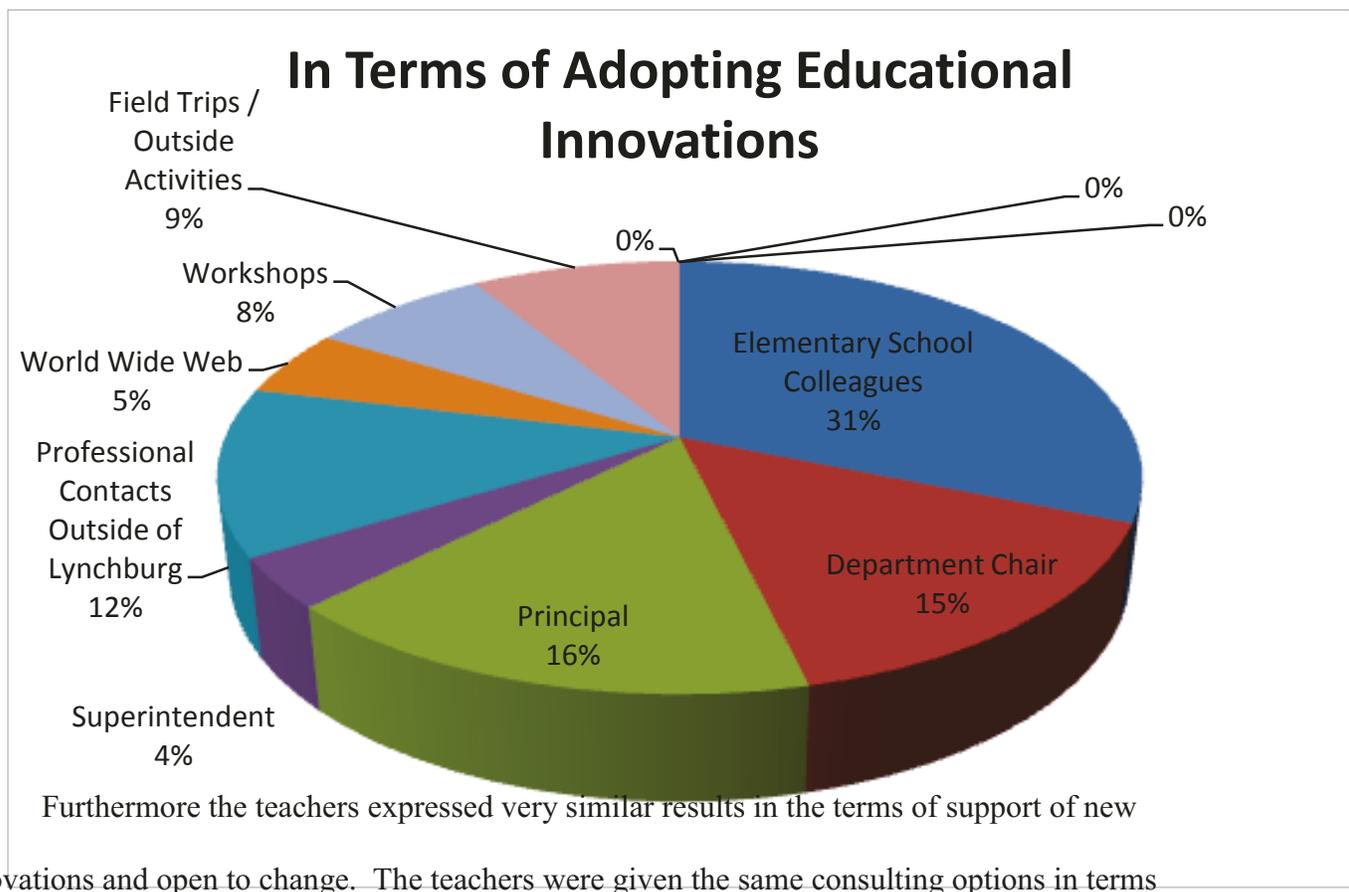
When asked which topics are most important in their inclusion within 5<sup>th</sup> grade curriculum, science and mathematics were regarded the most important based on rankings received. The teachers answered on a ranking scale of 1 – 5 (top five important topics with 1 representing most important and 5 as the fifth most important) and the percentage results are depicted below in Figure 3.

**Figure 3**



The teachers were also asked to rank the top five of the following in terms of frequency of consultation regarding educational innovations (i.e. 1= person/group consult with most often regarding educational innovations; 5= person/group that ranks fifth in list of top five, etc.) These data were collected by the teacher writing down their rankings next to a list of potential options. As indicated in Figure 4 below, the teachers were very similar with their rankings of who they would consult for educational innovations (Figure 4). The majority of the teachers interviewed would be more open to adopting educational innovations from their colleagues in their school.

**Figure 4**



of adopting educational innovations. Concerning the options, the teachers were asked to describe each one as to openness to innovations. The descriptions which were listed for each option were given a number. The teachers selected the descriptions and the table below

describes the data collected in terms of how supportive or skeptical to innovative changes. The numbers below indicate how many teachers selected that description. Interesting enough, none of the options were characterized as extremely skeptical innovations and resistant to change. On the other hand the elementary school colleagues and the teachers interviewed were characterized as extremely supportive of innovations and open to change.

**Table 1**

*Acceptance of Innovation and Change (n = 5).*

	Elementary School Colleagues	Local Community	Principals	Superintendent	Asst. Superintendent for Curriculum and Instruction	Virginia Dept. of Education	Local Teachers	5th Grade Interns	Yourself
Extremely Supportive of Innovations and Open to Change	5	0	4	n/a*	0	0	4	n/a**	5
Somewhat Supportive of Innovations and Open to Change	0	3	1	n/a*	4	3	1	n/a**	0
Somewhat Skeptical of Innovations and Resistant to Change	0	2	0	n/a*	1	2	0	n/a**	0
Extremely Skeptical of Innovations and Resistant to Change	0	0	0	n/a*	0	0	0	n/a**	0

*Note.* Number indicates number of teachers selecting item.

\*The LCS hired a new Superintendent in the spring term of the 2011/2012 school year and many of the teachers could not answer for him as they haven't developed a relationship with him at that time.

\*\*The teachers interviewed did not have any interns assigned to them for the 2011/2012 school year

During the teacher interviews, the teachers were all open to adopting and implementing the Urban Agriculture Day in the future for their students. The teachers were all 5<sup>th</sup> grade science teachers and discussed how more “hands on activities would definitely benefit the children inside of the classroom” which indicated that this style of learning would be ideal in the classroom setting. The lessons from the UAD “were simple enough to bring in the classroom and complex enough to cater to the SOL objectives that we have to teach”. Teachers could grasp

the concepts and be able to replicate them within the classrooms to illustrate certain SOL objectives or certain topics they would wish to cover.

All of the teachers interviewed were extremely supportive of innovations and open to change although the only hesitations were funding availabilities which can sometimes hamper the implementation of innovations. Some innovative ideas passed to the students from the teachers have been ones that “allowed the children to think freely and express themselves without restraint all while learning” which is a positive way to educate, but also could take more time than allowed because of the freedom. It was evident that the UAD was deemed a successful innovation as “Urban Agricultural Day allowed the students to do something with their hands and learn from it!”

The Relative Advantage, or the degree to which the UAD is perceived by the teachers, to the UAD based on the teachers comments were that it was effective and better than in the classroom because it was “free, which is always important with a limited budget” and “efficient in the way it covered many SOL components that we have limited time to review” with “hands on learning!” Due to the number of partners who agreed to assist with the UAD, the cost was minimal, yet the research based education was beneficial and priceless. Thus the better the perceived relative advantage of the UAD, the more likely its rate of implementation is likely to be.

The compatability of the UAD is the degree of being consistent with the values, practices, and needs of the teachers. All of the teachers agreed that if there were certain changes made to the schedule and improved communication, then the compatibility and complexity of the UAD and its hands on learning styles utilizing agriculture would be integrated without question into their teaching for SOL reinforcement. The lessons were not “that difficult to incorporate in the

class” which was the essential idea of the UAD: to demonstrate how the teachers can take agricultural hands on lessons into their classrooms.

In regards to trialability, the teachers all viewed lessons that they would be able to replicate inside their classroom to their 5<sup>th</sup> grade students. Having the UAD as trialable and allowing the teachers to experiment in the lessons by participating, observing their students and to perceive the content, lowers the level of uncertainty that the teachers may have. The teachers, while observing agriculture themed lessons created specifically for the UAD which incorporated the SOLs are now able to use the lessons without having to develop new materials to make their own in-class instruction new and/or reinforced. The teachers also have the ability to select what they would like to use from the UAD. This autonomy supports the data received from the interviews about acceptance of new innovations and change through the Diffusion of Innovation theory.

The teachers commented that “being able to see it being done and the incorporation of the SOLs made me feel confident that I could do it in my classroom. The teachers also commented that seeing “animals being used to teach the students about agriculture and having it tie in to the SOLs worked perfectly” and that “I loved seeing the kids learn about where food comes from.” This quality of the UAD, being observable, allowed the teachers to see firsthand the innovation which increased the likelihood for adoptability. Being able to observe the results lowered uncertainty and encouraged opportunities for discussion.

Many of the instructors for the UAD commented upon the children’s lack of knowledge of and around the barn animals (cattle, sheep, chicks, and hogs) and that while that station was incorporating SOL standards; it was also experiencing the child to something emotional, which was a new innovation in it of itself. The five qualities of the Diffusion of Innovation in regards

to the UAD created the framework for a future UAD and also opened up discussions about enhancements, successes, and opportunities to improve.

### **Conclusion**

The initial objective of UAD was to help teachers gain skills to incorporate agriculture into their classroom to assist them in teaching the SOL elements in hands on mechanisms and to see if they would adopt or reject the innovation. In regards to Figure 1, the 5<sup>th</sup> grade SOL results for 2011 were in the mid 80's in English, Mathematics, Science, and Writing. While the SOLs assess what the student has learned the schools are directly held responsible for the schools that administer them. The schools can possibly lose accreditation for the results received; therefore the need for reinforcement of those standards is warranted. While the UAD cannot be evaluated on the effectiveness in regards to student performance in the SOLs, it did utilize SOL aligned educational material for the 5<sup>th</sup> grade through agriculture.

Through the Diffusion of Innovation, the UAD demonstrated new techniques to the teachers using agriculture as its theme. In regards to the findings of the teachers surveyed, it is highly opportunistic that the UAD will be adopted for the future as well as the lessons incorporated within. Based on the data received in Figure 2 on the UAD survey, the teachers not only indicated their intent to participate in the future, but to utilize agriculture more in the classrooms to help facilitate the SOL standards. This adoption process of the UAD began with the teachers who participated in the UAD and are important to the UAD's success in the future because their comments and suggestions will be incorporated in making it better to suit their classroom needs and teaching effectiveness.

Based on the findings, the UAD was heavily supported after the event and is supported for next year, but even more important, many of the teachers are willing to take what they

learned from the UAD into their classrooms. In terms of adopting and accepting educational innovations (Figure 4 and Figure 5), which were presented in the UAD, the teachers are more apt to adopt innovations from their colleagues. As this event evolves, the teachers participating will share with other teachers the new ideas learned. Nonetheless, an important recommendation for the future would be to follow up with the teachers and see if the lessons are being taught within the classroom and are they effective; furthermore, are they more effective within the classroom or outside.

The UAD can be altered in the future if budgets become more tighter or other mechanisms become more refined, but on the topic of the Diffusion of Innovation theory the characteristic that was the most important was the degree that the innovation was able to be experimented, i.e. trialability. The trialability of the UAD demonstrates less uncertainty to the teachers who participated. The UAD allowed the teachers to ‘test’ the innovation by which it incorporated SOL lessons using agriculture as its basis. The teachers were able to try out parts of the UAD and have the opportunity to observe their students using a new program. The likelihood of the UADs adoption is related to the trialability of it.

The UAD proved to be adopted easier as an innovation by the teachers because they were able to observe and participate first hand with the lessons presented. Since the UAD is planned to be an annual event for the teachers, the relative advantage characteristic will constantly change as costs fluctuate, agricultural research improves, the schedule and flow of the UAD becomes more efficient. This characteristic is less important than the other four in terms of its degree to which the UAD is perceived as better than the idea it supersedes. The UAD will constantly be evolving and improving, yet the trialability of the methods and lessons will always

be in the forefront of the UAD event in order for the teachers to take new ideas into their classrooms.

With regard to future studies like this one based on the Diffusion of Innovation theory, other urban areas need to be investigated and more data collected from the teachers on its effectiveness and innovativeness. The appreciativeness of the UAD is evident in Lynchburg, but not in other urban areas in Virginia. Would the school systems of those urban areas be receptive to this type of innovation, educational framework based upon Virginia agriculture, in their community or not?

Ultimately, the students *and* teachers learned about Virginia agriculture through the lessons designed and catered to Virginia's Standards of Learning. Therefore, this program depicts what an urban youth learns about Virginia agriculture and begins to shape their opinion on it in the future. The teachers which participated in this program have become empowered to change their approach to things in the classroom in order to make a positive change. Lastly, while it is hoped that the SOL scores of the 5<sup>th</sup> grade students will increase due to the elements of this program, the teachers gained new knowledge and curriculum to add to their classroom exercises.

**Project Title:** Urban Agricultural Event

**Investigators:** Mr. Kevin F. Camm, Graduate Student  
Dr. Curtis R. Friedel, Assistant Professor

**I. Purpose of Research**

The purpose of this study is to examine how an urban agriculture program may benefit the 5th grade teachers in their ability to educate the Virginia Standards of Learning (SOL) components in subjects as it relates to agriculture. Specifically, this study will address the question: How do 5<sup>th</sup> grade teachers in Lynchburg perceive the characteristics of Urban Ag Day (UAD) for reinforcement of SOL components?

**II. Procedures**

You will be asked to complete a questionnaire and share with the interviewer their experiences as it relates to continued involvement of UAD and teaching of Virginia Standards of Learning. The interview will take no more than 20 minutes in total and will occur at a mutually agreed upon location.

**III. Risks**

There is no more than minimal risk when participating in this study.

**IV. Benefits**

There are no direct benefits to the participants. The indirect benefits are your experiences and opinions which will be used in the research as possible means to continually improve the understanding of how teachers may better utilize UAD to teach Virginia SOLs. There has been no promise or guarantee of benefits that have been made to encourage you to participate. Subjects may contact the researchers for a total summary of the study results.

**V. Extent of Anonymity and Confidentiality**

Protecting your identity is a top priority of this study. By participating in this research project, your information will be kept strictly confidential. Any information in the recorded interviews that potentially could identify you or others will be altered to insure confidentiality. Your name and any names you use during the interview will be assigned pseudonyms. At no time will information be released that allows an individual to be identified. At no time will the researchers release the results of the study to anyone other than individuals working on the project without your written consent. Only the research team will have access to your data. It is possible that the Institutional Review Board (IRB) may view this study's collected data for auditing purposes. The IRB is responsible for the oversight of the protection of human subjects involved in research.

**VI. Compensation**

There is no compensation for participating in this research.

**VII. Freedom to withdraw**

You are free to withdraw from the study at any time without penalty. You are free not to answer any questions without penalty.

**VIII. Participant's responsibilities**

I voluntarily agree to participate in this study. I have the following responsibilities:

- share with the interviewer my experiences as it relates to continued involvement of UAD and teaching of Virginia Standards of Learning.

**IX. Participant's Permission**

I have read and understand the Informed Consent and the conditions of this project. I have had all of my questions answered. I hereby acknowledge the above and give my voluntary consent:

\_\_\_\_\_ YES      \_\_\_\_\_ NO

\_\_\_\_\_  
Participant Signature

\_\_\_\_\_  
Date

## Survey of 5<sup>th</sup> Grade Teachers from Lynchburg City Public Schools

The following survey is divided into three sections. The first section asks for some background information. The second section focuses on what you might know about the agricultural education. The final section asks information regarding its adoption and implementation. The following questions will be asked in an unstructured format to allow flexibility for other interview questions.

1. Approximately how long have you served as a 5<sup>th</sup> grade teacher?

36 years/more  31-35  26-30  21-25  16-20  11-15  6-10  5/less

2. For approximately how long have you served as an educator, in general?

36 years/more  31-35  26-30  21-25  16-20  11-15  6-10  5/less

3. Please indicate the degree(s) you have obtained since college:

Master of Arts in: \_\_\_\_\_

Master of Science in: \_\_\_\_\_

Specialist Degree in: \_\_\_\_\_

Ph.D. in: \_\_\_\_\_

Ed.D. in: \_\_\_\_\_

Other: \_\_\_\_\_

4. Please check the best description of your work context:

Science  Mathematics  English  Social Studies  Extra-curricular

Other (Please describe): \_\_\_\_\_

5. Please rank order the **top five** of the following in terms of frequency of consultation regarding educational innovations (i.e. 1= person/group you consult with most often regarding educational innovations; 5= person/group that ranks fifth in list of top five...).

Your departmental / elementary school colleagues

Your department chair

The local principals

The Lynchburg superintendent

The assistant superintendent for curriculum and instruction

The State Department of Ed.

Mentor teachers assigned to your interns

Your 5<sup>th</sup> grade teaching interns

Your graduate teaching assistants

Professional contacts outside of city/town where I live

The World Wide Web (please describe): \_\_\_\_\_

Conference presentations / workshops (please describe): \_\_\_\_\_  
 Professional journal(s) / newsletter(s) (please name): \_\_\_\_\_  
 Other(s) (please describe): \_\_\_\_\_

6. Please check those professional organizations with which you have participated, and then check the box out to the side that best describes your level of involvement.

**1=Very active as a member (VA): i.e. "consistently publishing, presenting/serving as officer"**

**2=somewhat active member (SA): i.e. "attending conferences at least semi-annually"**

**3=inactive member (IM): i.e. "attending conferences at least once every couple of years"**

**4=not a member at present time (NM): i.e. "rarely, if ever participating in any capacity"**

**VA SA IM NM**

<input type="checkbox"/> Virginia Professional Educators	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
<input type="checkbox"/> The Association of Teacher Educators in Virginia	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
<input type="checkbox"/> Professional Association of Teachers	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
<input type="checkbox"/> The Virginia Association of the Gifted	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
<input type="checkbox"/> Other(s) (Please identify): _____	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

7. Please rate the following in terms of support of innovations and openness to change

**1=Extremely supportive of innovations and open to change**

**2=Somewhat supportive of innovations and open to change**

**3=Somewhat skeptical of innovations and resistant to change**

**4=Extremely skeptical of innovations and resistant to change**

Your departmental/elementary school colleagues:  1  2  3  4

The local community:  1  2  3  4

Local principals:  1  2  3  4

The Lynchburg superintendent:  1  2  3  4

The assistant superintendent for curriculum and instruction:  1  2  3  4

The Virginia Department of Ed:  1  2  3  4

Local teachers:  1  2  3  4

Your 5<sup>th</sup> grade teaching interns:  1  2  3  4

Yourself:  1  2  3  4

8. Please rank your **top five** most important topics for inclusion in the 5<sup>th</sup> grade curriculum (**i.e.**

**1=Most important; 5= 5th most important**):

- English
- Science
- Social Studies
- Math
- Art
- Reading
- Physical Education

- \_\_\_ Research design
- \_\_\_ State Guidelines
- \_\_\_ Standards of Learning
- \_\_\_ Lesson planning/Unit planning
- \_\_\_ Analyzing textbooks / materials
- \_\_\_ Technology in the Virginia classroom
- \_\_\_ Hands on learning
- \_\_\_ Other(s) (Please describe & rank): \_\_\_\_\_

9. In your experience as a 5<sup>th</sup> grade teacher, what has been the most important teaching innovation you have passed on to your students? \_\_\_\_\_.

What made it important? \_\_\_\_\_

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10. If we define relative advantage as the degree to which something is perceived as being better than the idea it supersedes, what is the relative advantage of Urban Ag Day?

11. If we define compatibility as the degree to which something is perceived to be consistent with the existing values, past experiences and needs of potential adopters, what is the compatibility of Urban Ag Day?

12. If we define complexity as the degree to which something is perceived as difficult to use, what is the complexity of Urban Ag Day?

13. If we define triability as the opportunity to experiment with something on a limited basis, what is the trialability of Urban Ag Day?

14. If we define observability as the degree to which the results of something are visible to others, what is the observability of Urban Ag Day?

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