

Going the Distance Part 2: Five Ways of Teaching an Extension Course: Elive, Blackboard, Teleconference, Correspondence, and Face-to-Face

Abstract

Remote and widely dispersed clientele in Alaska create a need for effective distance-delivery programs. Extension agents often travel via small airplane, snow machine, or boat to teach face-to-face classes in off-road communities. Effective and more cost-efficient delivery methods are needed. We taught a course for beginning farmers residing throughout Alaska using five delivery methods: Elluminate Live!, Blackboard, teleconference, correspondence, and face-to-face. We evaluated these delivery methods based on five areas: accessibility of delivery method, course completion, knowledge gain, plans to use skills, and student satisfaction. Our findings will help Extension professionals design distance-delivered programs suited to their target audience.

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Introduction

In Alaska, travel is time consuming and expensive for Extension agents who teach courses in distant and remote communities (Rader, Brown, & van Delden, 2012). Many communities served by Extension agents cannot be reached by road, and agents must travel via small airplane, snow machine, or boat. Travel is often prohibitively expensive for rural students to participate in face-to-face courses. A survey of Extension agents in Texas revealed that among the top perceived benefits of distance education were reduced travel time and expenses, and the ability to provide programs to larger, more diverse audiences in different locations (Dromgoole & Boleman, 2006). The same survey found the primary perceived disadvantages were students' lack of access to the technology and lack of student interaction with the instructor.

Although numerous studies have found students in distance-delivered courses performed comparably to peers in a face-to-face classroom setting (U.S. Department of Education, 2010), many Extension agents are reluctant to make distance-delivered education a substantial part of their programs (Dromgoole & Boleman, 2006; Franz & Cox, 2012; Parker, 2009; Williamson & Smoak, 2005). Williamson and Smoak (2005) alleged, "A big reason why some veteran Extension practitioners are hesitant to make the shift [to e-learning] rests with them not knowing—'What e-learning is?' and 'How to do it'" (Introduction). Earlier, Rader (2012) reviewed the literature in search of keys to successful, distance-delivered Extension courses (Ferrell & Fishel, 2007; Fishel & Ferrell, 2009; Fishel & Langeland, 2011; Langelotto-Rhodaback, 2010; McCann, 2007; Rich et

al., 2011) and found three: the course was in high demand, was high quality, and the delivery method was satisfactory.

In this article, we described the use of five delivery methods to teach a two-part course intended for beginning farmers. We look for differences and similarities among methods. Rader (2012) and Dromgoole and Boleman (2006) recognized the need for more research on distance-delivery methods in an Extension setting. The findings from the project reported here add to a growing body of knowledge on delivery methods and can aid Extension agents in their outreach efforts.

Purpose

We taught a non-credit Extension course using five delivery methods to explore delivery options for a remote audience. We think our insights could be useful for other Extension professionals.

In each delivery method we focused on five components:

1. Accessibility of Delivery Method,
2. Course Completion,
3. Knowledge Gain,
4. Plans to Use Skills,
5. Student Satisfaction.

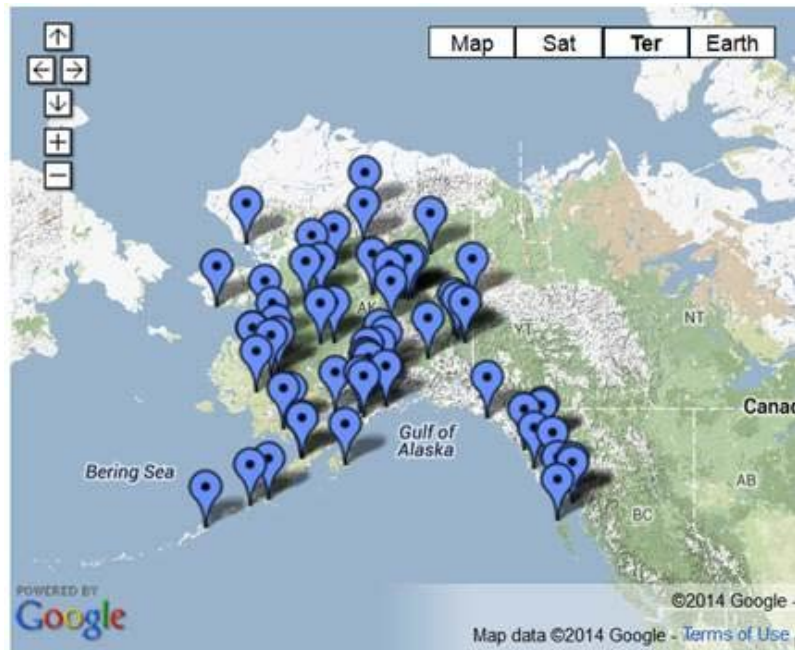
Methods

Course Overview

The Alaskan Growers School (www.uaf.edu/ces/ags) was developed for residents of remote villages (primarily Alaska Natives) who wanted to start a garden, farm, ranch, or other agri-business enterprise, but lacked the necessary knowledge and skills. Figure 1 shows that Alaskan Growers School (AGS) students came from all over Alaska. The course was divided into two sections: the Beginning Alaskan Growers School (BAGS) and Advanced Alaskan Growers School (AAGS) for a total of 22 lessons. Although we hoped students would complete the entire course (BAGS and AAGS), some only completed BAGS, and some only completed AAGS. Each lesson consisted of a PowerPoint presentation (presented by the instructor or guest lecturer), supplemental reading material, and a quiz. Agricultural professionals developed the presentations, which were then peer reviewed. Students did not pay for the course (see Acknowledgments), nor did they receive academic credit.

Figure 1.

Students in BAGS and AAGS were from 62 communities. Map data ©2014 Google.



Data Collection

Drafts of instruments were first reviewed by colleagues for construct and face validity, then pretested and revised several times. Teleconference and correspondence students completed quizzes on paper and returned them by mail. Students in other methods completed self-administered questionnaires and quizzes using Google Forms online.

Questionnaire and Quiz Order and Description

- AGS Application: Potential participants in AGS completed the application, which included questions about farming experience, background, and access to technology. Based on responses to questions about which delivery method they could access, we assigned each student to one of the five delivery methods: Elive, teleconference, Blackboard, correspondence, or face-to-face.
- Pre-Quizzes: We asked questions about the content to be covered to gauge students' knowledge before participating in BAGS and AAGS. We also asked what students hoped to learn in AGS and about education level; and prior gardening, computer, and distance education experience.
- Weekly Course Quizzes consisted of:
 - Three questions about the content covered in that week's presentation to assess knowledge gain;
 - Four retrospective pre-post questions to assess self-perceived knowledge gain; and
 - Five questions to assess students' plans to use skills.
- Final Quizzes: In addition to weekly quiz questions, in the final BAGS and AAGS quizzes Students were asked questions about each of the sections, BAGS and AAGS, as well as the overall Alaskan Growers School course.

We differentiated results from BAGS or AAGS and by method because a different number of students

completed each section of AGS. Our analyses were limited by the small number of respondents in each section and each delivery method. Google Forms provided summary statistics, and we downloaded the data to Microsoft Excel and SPSS for additional analysis.

Course Delivery Methods

Below is a brief overview of each delivery method used. The content and structure of the course remained the same regardless of the delivery method.

Illuminate Live (Elive) is a Web-based conferencing program. Students could see the presentation and hear the presenter's voice over the Internet. Students asked questions with a digital microphone or by typing questions into a chat box. Teleconference and Elive students participated in the same lecture.

Blackboard Learn is an online classroom portal. Students could access course materials, including the PowerPoint presentation, readings, quizzes, and a discussion board. This delivery method was self-paced and did not have a live lecture, although students could listen to a pre-recorded audio from the Elive class, uploaded to Blackboard.

A **teleconference** delivery allows numerous students in different locations to participate on the same phone call. Students called the designated teleconference number at class time and could hear and speak to the instructor as well as the other students. Printed course materials, such as PowerPoint slides, were mailed to each student prior to class. Students used the printed slides to follow along with the lecturer. As mentioned previously, teleconference and Elive students participated in the same lecture.

Correspondence course materials were printed and mailed to correspondence students who returned them by mail. Weekly quizzes were entered manually into Google Forms.

In the **face-to-face** course students attended class 8 hours a day for 1 week in Fairbanks, Alaska. Students came from all over Alaska. Student travel and associated costs were paid for by the project grant (see Acknowledgements).

Student Assignment to Delivery Methods

Students were assigned to a particular delivery method based on their ability to access each method as reported in their AGS application (Figure 2). Sixty students were enrolled in BAGS, and 65 enrolled in AAGS. They were assigned in roughly equal numbers to each delivery method. However, although an effort was made to distribute students equally among methods, only 51 BAGS students and 55 AAGS students completed the pre-quiz (Table 1). For synchronous methods (Elive, teleconference, and face-to-face), students were also assigned based on their self-reported time-of-day availability. After that, students were assigned to the remaining methods. Because of the small number of students, sampling wasn't needed, and so the students constitute the population in this effort.

Results

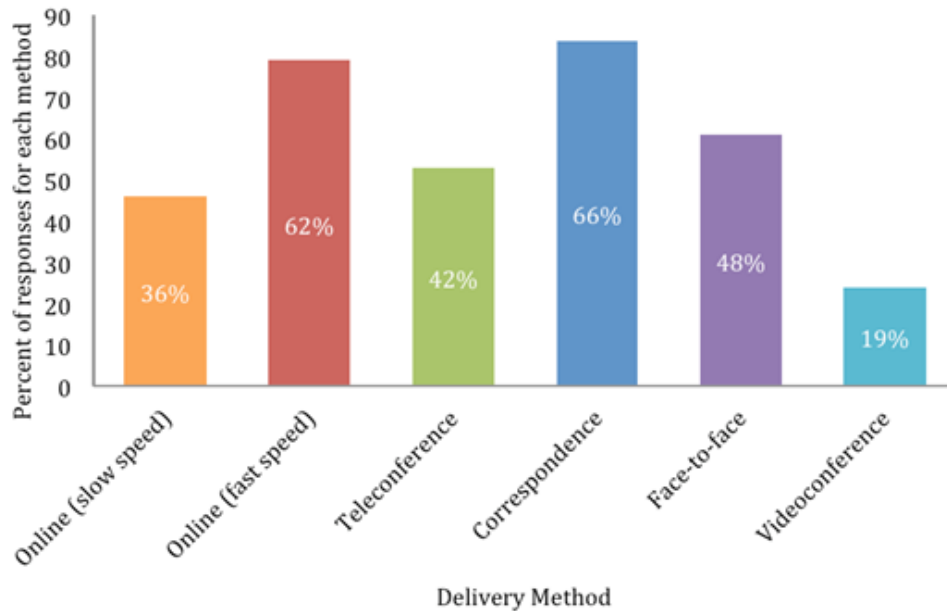
Accessibility of Delivery Method

Students could select multiple delivery methods (Figure 2); 66% (n=84) said they were able to complete the course by correspondence, 36% (n=46) online at slow speed, and 62% online at fast speed. The survey revealed that the majority (81%) of potential students could not participate by videoconference, so the course was not offered by videoconference. Students were encouraged to select all methods they could access.

Students weren't thorough in their responses: presumably all students could receive mail and so could take the course by correspondence; and those who responded they could take the course online at high speed could presumably take it at slow speed.

Figure 2.

Percentage of Prospective Student Responses Indicating Their Ability to Access Each Delivery Method Based on the AGS Application



Course Completion

Course completion differed between delivery methods and between BAGS and AAGS. Clearly, the range from 100% to 25% is substantial. Table 1 shows the number of students, by delivery method, who completed the pre-quiz and final quiz of BAGS and of AAGS.

Table 1.

Number and Percentage of Students in BAGS and AAGS in Each Delivery Method Who Completed the Pre-Quiz and Final Quiz

| | Delivery Method | | | | | |
|-----------------------------------------|-----------------|------------|-----------------|-----------------|--------------|-------|
| | Elive | Blackboard | Tele-conference | Corre-spondence | Face-to-Face | Total |
| Beginning Alaskan Growers School (BAGS) | | | | | | |
| Pre-quiz | 12 | 8 | 11 | 9 | 11 | 51 |
| Final quiz | 8 | 2 | 6 | 7 | 11 | 34 |
| % Completed | 67% | 25% | 55% | 78% | 100% | 67% |
| Advanced Alaskan Growers School (AAGS) | | | | | | |
| | | | | | | |

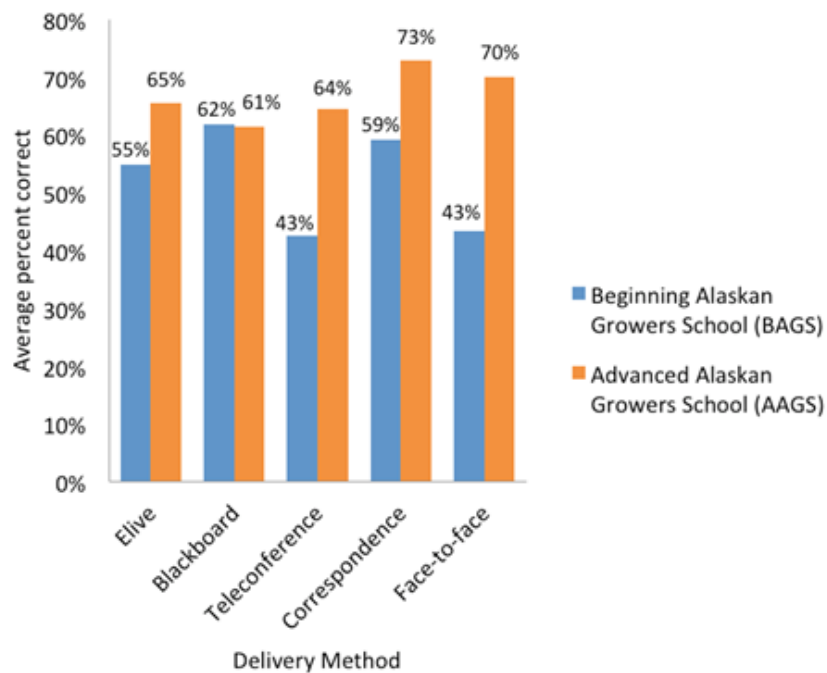
| | | | | | | |
|-------------|-----|-----|-----|-----|------|-----|
| Pre-quiz | 11 | 12 | 10 | 12 | 10 | 55 |
| Final quiz | 6 | 9 | 9 | 9 | 10 | 43 |
| % Completed | 55% | 75% | 90% | 75% | 100% | 78% |

Content Knowledge Gain

Knowledge gain was quantified using content-based questions (Figure 3). These questions asked about topics addressed in the lesson, such as, "Alaska is all one growing zone?" This was followed by four possible answers. Among BAGS students, the percentage of correct answers ranged from 43% (teleconference and face-to-face) to 62% (Blackboard). All AAGS students demonstrated high levels of knowledge gain, ranging from 61% in Blackboard to 73% in correspondence. Content knowledge gain was calculated by subtracting the sum of correct responses on the pre-quiz of BAGS and AAGS from the sum of correct responses on the BAGS and AAGS final quiz. Results were then converted to a percentage, shown in Figure 3.

Figure 3.

Percentage of Content Knowledge Gain for Each Delivery Method for BAGS and AAGS



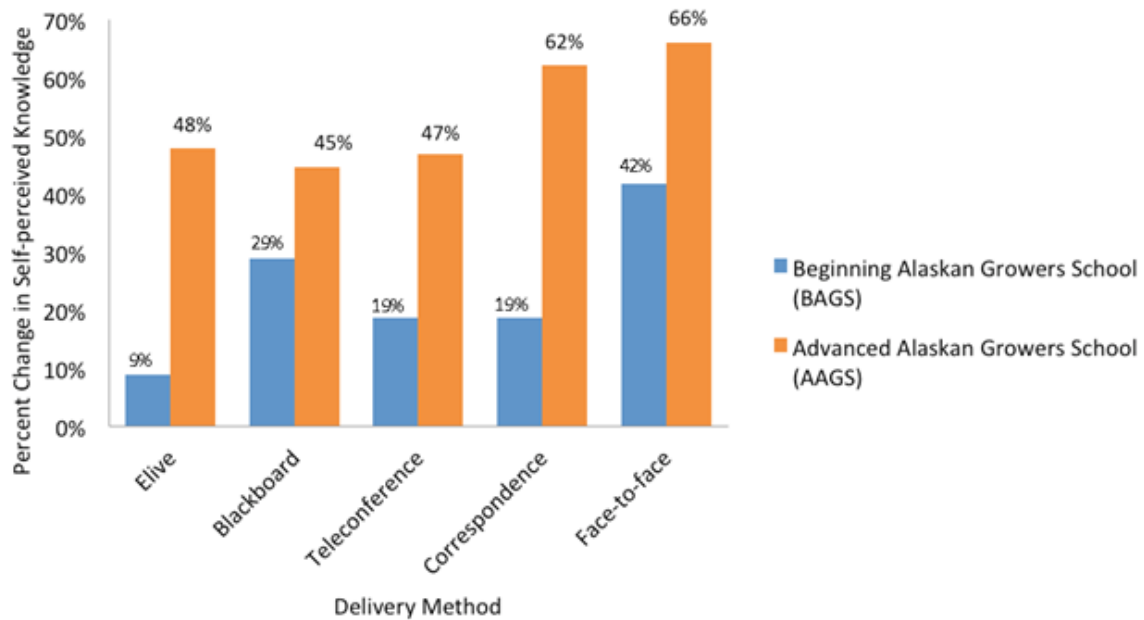
Self-Perceived Knowledge Gain

We used retrospective questions to gauge students' self-perceived knowledge gain. Following each lesson, students were asked to retrospectively rate their knowledge before and after the lesson. For example, to the question, "What was your understanding before the workshop about diseases, deficiencies, and pests in Alaska?" students were asked to rate their knowledge as 1 = Non-existent, 2 = Minimal, 3 = Moderate, or 4 = Considerable, before and after the lesson. The sum of the points before was subtracted from the points afterward. This self-perceived knowledge gain was averaged across all quizzes for each delivery method, translated to a percentage, and shown in Figure 4.

In BAGS, face-to-face students had the highest self-perceived knowledge gain (42%), while Elive students rated their knowledge gain the lowest (9%). Overall, students in AAGS rated their knowledge gain considerably higher than those in BAGS, with Blackboard students rating their knowledge gain as 45% and face-to-face students rating theirs as 66%.

Figure 4.

Students' Self-Perceived Knowledge Gains for Each Delivery Method, for BAGS and AAGS Measured by Retrospective Questions



Plans to Use Skills

The final BAGS and AAGS quizzes asked students about their intentions to use the skills learned in the course, such as starting a large garden or a for-profit farm or raising bees. For the sake of simplicity, Table 2 shows a portion of the data we collected on students' intentions. It's important to note that some students who did not plan to use the skills within a year may have already been using the skills before class or started during the class. Elive and Blackboard students had the lowest percentage of students planning to use skills within one year of completing AAGS.

Table 2.

Percentage of Students Who Planned to Use Various Skills within One Year of Completing AAGS

| Skill | Elive (N=6) | Blackboard (N=10) | Teleconference (N=9) | Correspondence (N=9) | Face-to-Face (N=10) |
|-----------------------------------|-------------|-------------------|----------------------|----------------------|---------------------|
| Plant a home garden for my family | 33% | 0% | 11% | 11% | 40% |
| Plant a home | 0% | 40% | 44% | 56% | 60% |

| | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|
| garden for my family plus 10 other families | | | | | |
| Start a tribal, school, or community garden | 0% | 30% | 11% | 56% | 40% |
| Start a community shared agriculture farm | 0% | 0% | 11% | 22% | 50% |
| Start a for-profit farm | 0% | 20% | 56% | 44% | 80% |
| Raise bees | 0% | 20% | 44% | 44% | 30% |
| Raise poultry | 0% | 30% | 22% | 22% | 50% |
| Raise livestock | 0% | 20% | 44% | 44% | 50% |
| Apply for a grant or program | 17% | 30% | 44% | 44% | 80% |
| <p><i>Note.</i> Students were asked, "Now that you've completed the Alaskan Growers School [AAGS], what are your plans?" Shown above are the percentages of students in each method who chose "I plan to do this within 1 year." Not shown were the percentage of students who chose: "No plans to do this," "I did this before class," and "I started doing this during class."</p> | | | | | |

Student Satisfaction

Students were asked, "Please rate [BAGS or AAGS], overall, as a learning experience" with the following options: very poor, poor, neither good nor poor, good, or very good. Regardless of delivery method, in both BAGS and AAGS, more than 90% of students rated BAGS and AAGS as "good" or "very good." Students were also asked to rate the relative importance of various aspects of the course (Table 3). Overall, students rated course presentations and optional links to outside material as the most important aspects and rated discussions after class and course quizzes as least important. One Blackboard student articulated the pros and cons of completing an independent course: "I miss the interaction with other growers, but surely appreciated the opportunity to do the coursework online, as time permitted." A correspondence student said, "I like that I was able to fit the lessons into my schedule and the information was so comprehensive."

Table 3.
Mean Student Rating of Several Aspects of AGS (Highest Rating is 3)

| | | Delivery Method | | | | | | | | | |
|--|--|-----------------|------|------------|------|----------------|------|----------------|------|--------------|------|
| | | Elive | | Blackboard | | Teleconference | | Correspondence | | Face-to-Face | |
| | | BAGS | AAGS | BAGS | AAGS | BAGS | AAGS | BAGS | AAGS | BAGS | AAGS |
| | | | | | | | | | | | |

| | (N=8) | (N=6) | (N=2) | (N=10) | (N=6) | (N=9) | (N=7) | (N=9) | (N=11) | (N=10) |
|------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Aspects of course | <i>M</i> | <i>M</i> | <i>M</i> | <i>M</i> | <i>M</i> | <i>M</i> | <i>M</i> | <i>M</i> | <i>M</i> | <i>M</i> |
| Presentations (with photos) | 2.9 | 3.0 | 2.5 | 3.0 | 3.0 | 3.0 | 3.0 | 2.9 | 2.9 | 2.9 |
| Optional links to outside material | 2.6 | 2.8 | 3.0 | 3.0 | 2.8 | 3.0 | 2.8 | NA | 2.9 | 3.0 |
| Guest lectures | 2.4 | 2.8 | NA | NA | 3.0 | 3.0 | NA | NA | 2.6 | 2.9 |
| Delivery method | 2.6 | 2.7 | 3.0 | 2.5 | 3.0 | 2.7 | 2.5 | 2.6 | 2.9 | 2.6 |
| Completing at my pace | NA | NA | 3.0 | 2.7 | NA | NA | 3.0 | 2.6 | NA | NA |
| Instructor | 2.3 | 2.2 | 3.0 | 3.0 | 2.5 | 2.9 | NA | NA | 2.5 | 2.9 |
| Discussions after class | 2.5 | 1.6 | NA | NA | 2.5 | 2.8 | NA | NA | 2.3 | 2.9 |
| Course quizzes | 2.1 | 2.0 | 2.0 | 1.8 | 2.5 | 2.0 | 2.3 | 2.2 | 2.3 | 3.0 |

Note. In the final BAGS and AAGS quizzes, students were asked, "For you, how important were the following aspects of [BAGS or AAGS]?" Means were calculated from the scale: 1 = Not at all important, 2 = Somewhat important, and 3 = Very important. The course aspects are arranged from top to bottom, most important to least important, based on overall means. NA = Not Applicable; N = Number of students who answered the question.

Discussion

We developed and successfully delivered an Extension course to remote residents of Alaska using different delivery methods. There were advantages and disadvantages to each method from the perspective of the student and instructor.

Our assumption that correspondence, teleconference, and face-to-face delivery methods were universally accessible was challenged. While all students received mail, one student lived in an extremely remote location (Ugashik, Alaska) and only received mail once a week. Correspondence delivery became a slow and cumbersome method for this student and the instructor. Additionally, telephone service, teleconference systems, and the Internet were not reliable, leading to frustration for everyone. Of the students who were accepted to the face-to-face course, 40% did not attend. This was unexpected because expenses for the class, including travel and lodging, were covered by the grant.

We used course completion as one measure of the effectiveness of the non-credit course. If students didn't

view the course material as interesting and applicable to their goals, they were probably less likely to complete the course. While all the face-to-face students completed the class, some of them found the amount of information overwhelming and the days long (8 hours a day). Of the distance-delivery methods, the correspondence students in both sections were most likely to complete the course (BAGS, 78%; AAGS, 75%), while Blackboard students were the least likely to complete the course sections (BAGS, 25%; AAGS, 55%).

In every delivery method students showed a substantial increase in their knowledge of the material covered in the class, so all students demonstrated that they knew more after completing the course. Advanced Alaskan Growers School students in two methods scored above 70%, with the corresponding BAGS students' scoring roughly 30 percentage points lower. The most striking scores were in Blackboard, where there was one percentage point difference between BAGS and AAGS. We are uncertain as to whether this reflects an underlying characteristic of this delivery method.

A higher percentage of face-to-face students reported they planned to use the skills from class than in any other method. We speculated that the face-to-face interaction may have provided familiarity and made the skills seem more attainable. Yet, at the same time, over half of the students in all methods reported they were using these skills before the class started or began using them during class. Perhaps there was a difference in the type of student that was able to be away from home and chose to take the class face-to-face.

Students in all delivery methods provided positive scores and comments about course presentations and readings. Overall, course presentations were considered the most important aspect of the course ($M = 2.9$), while course quizzes were considered the least important aspect of the course ($M = 2.2$; Table 3). The delivery method was rated as the third most important aspect of the course with 64% of students reporting it was "very important." Overall, student satisfaction averaged 3.74. Based on student ratings we considered the course successful and high-quality. Rader (2012) identified high course quality as a key to successfully delivering an Extension course by distance methods.

Two surprises emerged, both in asynchronous methods. Blackboard AAGS students scored at the lower end of both content and perceived knowledge gain; gave the method the lowest percentage of very good ratings; and were the least likely to complete the course. The correspondence students had among the highest scores for course completion, content-based knowledge, and plans to use course skills. No other method had scores as consistently high. In part, we ascribe these results to the relative newness of technology in rural Alaska. In the past 24 months broadband has been installed in 73 libraries. In many communities this is the only Internet access.

Several students reported that they would appreciate the flexibility of being able to access the course in more than one way. One correspondence student noted, "I think having an instructor teach the course through a video feed, in addition to the reading material would have improved the course," and a Blackboard student said, "I miss having the interaction with other growers, but surely appreciated the opportunity to do the coursework online as time permitted."

Offering a distance-delivered course in a combination of methods can increase opportunities for student learning and satisfaction. The next time we taught the Alaskan Growers School, we offered it using Elive, teleconference, and Blackboard. The primary disadvantages of distance-delivered courses are a lack of face-to-face interaction and hands-on activities. However, video-based learning and other technological advances will likely continue to improve in mimicking face-to-face interactions. The advantages of distance-delivery education such as reaching a widely dispersed audience without travel costs and even offering courses at a lower cost will continue to be reasons to use distance-delivery methods in an Extension setting.

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