Are there Differences in Academic and Social Integration of College of Agriculture Master's Students in Campus Based, Online and Mixed Programs?[1]

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Abstract

To investigate differences in student's academic and social integration between campus based and online programs, College of Agriculture Masters students in U.S. campus and online degree programs were surveyed. To investigate potential influences of differences, College of Agriculture graduate program directors were surveyed. Data were gathered using online questionnaires. The student questionnaire included demographics and three scales, academic integration, social integration and intention to persist. Academic integration was measured with the subscales of advisor relationship and academic interaction. Social integration was measured with the subscales of peer group support, faculty interactions and involvement in social interactions. The director questionnaire included five variables designed to measure attitudes and design of online programs. Descriptive statistics, ANOVA, Mann-Whitney U and Tukey's HSD were conducted to identify program differences and to identify attitude and program format differences. Significant differences were found between online and campus students on academic and social integration scales, but not on the intention to persist scale; and on graduate director attitudes and types of communication used in the graduate online programs. This study indicates that there are differences in integration of campus and online students. Strategies to improve online student's socialization may include communication components designed to increase meaningful interactions.

Introduction

In recent years, there has been a great increase in online learning. In 2006-2007, the National Center for Education Statistics reported that 66% of 2-year and 4-year institutions offered college-level distance education courses (U.S Department of Education, 2009). In 2012 that number grew to 86.6% (Allen and Seaman, 2013). There were also an estimated 20 million students enrolled in these distance education courses, out of which 6 million are taking at least one online course (Allen and Seaman, 2013). These courses have allowed many students to pursue educational degrees without being limited by their distance to a university (Card and Horton, 2000).

Many sources report higher dropout rates for online courses and programs as compared to traditional campus based courses and programs (Carr, 2000; Diaz, 2000). Carr (2000) for example, found student persistence in campus based programs was 10-20% higher than in distance programs, though there was a lot of variation in this persistence between institutions, with some reporting rates of 80% completion and others reporting less than 50% completion. Parker (1995, 1999) also found that some first attempts at adapting courses for distance learning had high dropout rates of 70-80%, and even many established programs expect a higher dropout rate than a corresponding campus course, at the rate of 11-15% (Bos and Shami, 2006). Thus, retention in online degree programs and courses is a challenge of many universities today.

Patterson and McFadden (2009) looked at completion rates of students in two online graduate degree programs as compared to the campus-based delivery format of the same two programs. The online and campus-based programs were mostly identical; they were based in the same departments and used the same professors, curriculum, assignments, technologies and support services to control for intervening variables. The study found that the two campus-based programs had drop-out rates of 11% and 4%. In contrast, the

online programs had drop-out rates of 43% and 23.5% respectively (Patterson and McFadden, 2009). Also, there was no significant relationship found between students' GPA or admission test score and dropout.

What other factors, then, is influencing retention in online programs? Rieger (2002) suggested the abundance of hands-on-learning and visual content in agriculture programs may not transfer well to distance education. The online environment can provide a more diverse group of students from a wide array of locations and with different backgrounds (Cassiani, 2001). This can contribute to a lack of interaction, and this lack of interaction, along with a deficiency of hands-on experience, may make students feel isolated (Paul and Brindley, 1996). Compounding this problem is the fact that one study found that though in some courses students created a supportive and interactive environment with their teachers and other students, the environment lasted only through that particular class, or in some cases, particular activity (Ivankova and Stick, 2007). This lack of interaction may be problematic as Tinto (1993) suggests that interactions between students and faculty at a university shape student's development through socialization, which, ultimately, affects their persistence at a university.

Gardner (2008) defines socialization as the process through which students learn how to behave and what it means to succeed or fail. Eaton and Bean (1993) theorized that, "*Social and academic integration can be considered to be primary indicators of adjustment to the college environment*" (p. 9). Socialization, then, can be described by two different constructs, academic integration and social integration. Social integration involves interpersonal relationships, support, interactions with others and a sense of belonging at a university (Spady, 1970; Tinto, 1975). Social integration stems from extracurricular activities, informal dealings with student's peer group and interactions with faculty and staff (Tinto, 1975). When these activities are successful, they will help a student develop friendships, support, affiliation and channels of communication (Tinto, 1975). Academic integration is explained by grade performance and intellectual development. Grade performance reflects an ability to meet the standards of the academic system; intellectual development involves a student valuing their education as a process of development in which they gained knowledge and ideas (Tinto, 1975). Academic integration is key because it involves students becoming integrated into the system that will allow them to achieve their goal of becoming professionals in their disciplines (Lovitts, 1996).

These theories provide a basis for which to examine graduate student persistence. Tinto (1993) suggests that research done on graduate student persistence will yield similar findings as those done on undergraduate students. However, there are differences to be considered when examining graduate education as opposed to undergraduate education. First it is more likely that the pattern of persistence will be more similar among the same field of study across institutions than among different fields at the same university (Zwick, 1991). Additionally students' social interactions with both peers and faculty are closely linked with students' intellectual development, as well as the development of the skills and knowledge necessary to complete the degree. Social membership in a program becomes part of a student's academic membership in the program and, ultimately, in the student's field (Tinto, 1993). The second difference in graduate education is the goal of socialization. According to Baird (1992) and Rosen and Bates (1967), the goal of graduate student socialization is to take a raw scholar and turn them into an academic professional. Finally, unlike with undergraduate students, the affect that the community has on the graduate student changes over time (Tinto, 1993). For example, Tinto (1993) mentioned that persistence in the later part of the degree, which involves research, is likely to be influenced by a single faculty member or a small group of faculty members. This is not so much the case in the beginning stages of a doctoral student's degree.

As discussed above, relationships between students and their advisors, committees and peers influence the process of socialization, integration and ultimately students' persistence in their degree programs. Thus, our research question is: does the online environment effect student's persistence to complete?

The objective of this study was to explore factors relating to academic and social integration. Specifically, are there differences in student's academic and social integration between campus based and online programs in the College of Agriculture and do these differences affect student's persistence? Also, is integration a factor that is being considered when designing an online course or program and if so, what steps are taken in the design of the course or program to increase integration?

Materials and Methods
Sample

The study population was students and graduate program directors from Colleges of Agriculture with campus based and online Master's degree programs. The student sample was drawn from equivalent campus based and online programs that had similar requirements, professors and structure. We began by identifying U.S. universities that had both online and campus based agriculture programs. The programs were found through online searches of university webpages. Seven universities containing relevant programs were identified, University of Nebraska, Texas Tech, Virginia Tech, Iowa State, North Carolina State, Texas A & M and Washington State. From these universities, 16 online and campus programs were identified. These programs included agronomy, horticulture, agriculture, plant breeding and pest management degrees. Invitations to participate resulted in all but Texas A & M agreeing to participate.

Are there Differences in Academic

The graduate program director sample was drawn from graduate directors of online College of Agriculture Master's degree programs. The sample came from various U.S colleges that had online College of Agriculture graduate programs that were identified through online searches of university web sites.

Instrumentation
Overall Measurement of Integration

To collect the data a questionnaire instrument was used. Questions were adapted from instruments from Sorokosh (2004), Little (2009), Cardenas (2005) and Donatelli (2010) which had reported Cronbach's alpha reliability ranging from 0.81 to 0.96. Cronbach's alpha is a measure of internal consistency for a set of related items. A reliability coefficient of .70 or higher is considered acceptable in most social science research situations. A six point Likert type scale of agreement or a six point scale asking "how often have you done the following interactions" were used.

The first subscale contained questions on student's academic integration. The two variables included in measuring academic integration were advisor relationship and academic interactions. The scores of the two variables were combined to create an average academic integration score. The advisor relationship variable consisted of eight questions. The first, do you have an advisor consisted of a yes or no response. The remainder of the questions measured the quality of the relationship between the student and their advisor. These included questions such as: "my advisor advises me effectively" and "my relationship with my advisor has had a positive influence on my intellectual growth." The participation in academic interactions variable contained seven questions designed to measure the frequency students participated in academically focused interactions with others. The questions were adapted from Cardenas' (2005) questionnaire designed to measure doctoral student involvement. Some of the interactions asked about were "attended professional conferences or meetings" and "attended research seminars in yours or others disciplines." The responses were based on a six point scale, asking how often they have done various interactions.

The second subscale measured social integration by three variables; peer group support, interactions with faculty and involvement in social interactions. The sums of the three variables were combined to create a social integration score. The peer support variable contained 11 questions designed to measure the strength and usefulness of student's support from their peers. The variable included questions like "since starting this program I have developed close personal relationships with other students" and "few of the students I know would be willing to listen to me and help me if I had a personal problem." The responses were based on a six point Likert type scale measuring extent of agreement with each statement. The faculty support variable contained 11 questions designed to measure the opportunities and ease students had interacting with faculty members as well as the impacts these interactions had on students. Students were asked to rate, on a six point Likert type scale, the extent to which they agreed with statements. Some statements were "I am satisfied with the opportunities to meet and interact informally with faculty members" and "faculty are very accessible." The final variable was involvement in social interactions. This variable contained 6 questions designed to measure student's involvement in informal social interactions. Some interactions asked about were "attended informal dinners and get-togethers with other fellow students" and "met with students to talk about course work, plans of work and faculty." The responses were based on a six point scale, asking how often they have done various interactions.

Intention to Persist Instrument

Several studies have found a link between intention to persist and student's actual persistence (Bean, 1982, Bean, 1990; Faghihi and Ethington, 1996). Therefore a scale measuring intent to persist was included in this instrument. The scale consisted of five questions and responses were based on a six point Likert type scale of agreement. Some questions included were "I am confident I made the right decision to enroll in this program" and "I am sure that I will complete this degree program."

Graduate Director Instrument

For this part of the study a questionnaire was used to collect data. The questionnaire contained five variables. The first variable measured the extent to which they agreed that interactions and relationships between themselves and students and between students and each other are important. Interaction was defined as "the activity of being with and talking to other people and the way that people react to each other" ("Interaction," 2013). As mentioned above, many studies (Gardner, 2007; Tinto, 1975; Spady, 1970) support that interaction between students and faculty is important in developing academic and social integration. Relationship was defined as "the way in which two or more people talk to, behave toward and deal with each other" ("Relate," 2013).

The second variable measured the format and design of the online program overall or in the individual courses of the program. Included were questions about face to face interaction, asynchronous text communication, online collaborative sharing, synchronous video communication, synchronous text communication and the use of social networking sites. They were asked whether these format components were used "at the programmatic level", which was defined as *"Components used within the graduate program as a whole, targeted to all students in the program regardless of the individual courses they may be enrolled in;" "used in a program course,"* which was defined as *"Components used by instructors within and for their individual courses, tar-*

geted to students enrolled in a specific course" or "used both at programmatic and course level."

The third variable measured whether or not these components were specifically planned within the course with the purpose of encouraging interaction between students and their peers or between themselves and their students. Graduate directors were again asked whether the components were used "at the programmatic level", "used in a program course" or "used both at programmatic and course level."

The next two questions asked graduate directors to rate which of the above components they felt were effective at achieving interaction and discussion between themselves and their students or between students and each other at both the program and course level. The graduate directors were asked to rank the components they felt were effective with a one being the most effective component and six least effective.

Finally, the fifth variable measured the frequency the components were used. They were asked to rate, on a scale of 1-5 how often they used each of the components at both the program and course level; with a 1 indicating daily or every other day usage, 2 indicating weekly, 3 indicating two to three times a month, 4 once a month and five less than once a month.

Data Collection
Student Survey

The instrument was pilot tested using Axio Survey (Axio Learning, 1.0, Manhattan, KS). M.S. students in the Kansas State University Horticulture department received an e-mail asking for their participation. The e-mail included a link that took them to the questionnaire. Once they clicked on the link in the email they were taken to the beginning of the questionnaire. There they saw a statement with privacy information and were asked if they consented to be included in the pilot test for the study. They were then taken to the remainder of the questionnaire. After the data were collected Cronbach's reliability coefficients were calculated and a correlational matrix was constructed. Because the Cronbach's alpha's were all above 0.70 no questions were removed. Also, no patterns indicating the scales were measuring different constructs were identified.

The national survey was offered online through Axio Survey. E-mails were sent out to the graduate directors of the programs identified. In some cases the same person was the director of both the online and campus based program at the university; otherwise the e-mail was sent to both the campus and online graduate director. The e-mail included some information about the study and a request to forward a message and survey link to all the Master's degree graduate students that were currently enrolled in their program(s). The e-mail also included a request for the graduate directors to respond as to whether or not they forwarded the message to their students and an e-mail address to contact if they had any questions. The message for the students and the link to the online survey was included in the bottom of the e-mail to the graduate directors. The message to the students also included some information about the study, a request for their participation, an incentive and a link to the online questionnaire.

One follow up e-mail was sent to the graduate directors with the same information and request for them to forward a message to all the students enrolled in their program. The message to the students included a reminder request, information about the incentive and a link to the online survey. Both the original and follow up e-mail were sent in the same semester.

As mentioned above, students received the invitation to participate in the survey through their graduate director. Included in the email was a link to the online survey. Once students clicked on the link in the email they were taken to the beginning of the questionnaire with a statement of privacy information and were asked if they consented to be included in the study. Students were then taken to the remainder of the questionnaire. The questionnaire was completely anonymous. After the end of the questionnaire students were given the option to provide an e-mail address which would be used to send them their incentive. A total of 54 Master's students responded, and of these 42 were usable. There was representation across all six universities included in the study. Program directors were asked to provide the total number of students they sent the survey e-mail request to. This number was not provided from all programs so a response rate cannot be calculated.

Graduate Director Survey

We began by identifying U.S. universities that had online College of Agriculture Master's degree programs. These programs were identified using online university and departmental websites. Programs at 15 universities were identified, the types of programs included agriculture, agricultural education, agroecology, agronomy, crop science, horticulture, pest management, plant breeding and turfgrass management.

The survey was offered online through Axio Survey. Once programs were identified, e-mails were sent out to the graduate directors of the programs (n=15) that included some information about the study and a link to the survey.

One follow up e-mail was sent to the graduate directors with the same information and request for participation. Both the original and follow up e-mail were sent in the same semester.

Once graduate directors clicked on the link in the email they were taken to the beginning of the questionnaire with a statement with privacy information and were asked if they consented to be included in the study. Directors were then taken to the remainder of the questionnaire. The questionnaire was completely anonymous. Fifteen graduate directors were invited to participate, 12 did, for a response rate of 80%.

Data Analysis
Student Data

Data was downloaded into Microsoft Excel (Microsoft, 2010, Redmond, Washington) and analyzed using Minitab (Minitab, Inc, 16, State College, PA). Answers were coded 1 (strongly disagree) to 6 (strongly agree). Data analysis conducted to examine the difference between online, mixed and campus based graduate students on the academic and social integration scales, subscales and the intention to persist scale included ANOVA and Tukey's HSD, to determine if there was a significant difference between campus based and online students on any of the measures.

There was a difference in the subscale of academic interactions between how students were answering two of the seven questions (ANOVA). There were two different sub-constructs within the academic interactions construct. Thus the academic interactions construct was broken into two groups, research interactions and non-research academic interactions. Research interactions included questions such as "Met with fellow students to talk about your research" and "Attended research seminars in yours or others disciplines." Non-research interactions included questions such as "Met outside of class with other students in your program for a meeting, discussion, or study group" and "Participated in departmental colloquium or brown bags."

Graduate Director Data

Descriptive statistics were run to assess the percentage of directors who answered each category to determine what percentage either "agreed" or "disagreed" that interaction and relationships, either between themselves/instructors and students or between students were important.

Because of the ordinal nature of the data, a Mann-Whitney U Test was run between the two questions involving interactions and relationships between students and the two questions involving interactions between themselves/instructors and students in an online graduate degree program. The importance of the interactions and relationships was the dependent variable with the groups of student to student interactions/relationships and director/instructor to student interactions/relationships being the independent variables. This was done to test whether the importance assigned to these types of interactions and relationships was the same for both groups.

A Tukey's HSD was run on the responses from the question of "Please indicate … how often these components are used at the programmatic level" to determine if there was a difference between how often each of the components were used at the program level in the online agriculture programs. The components included face to face interaction, asynchronous text communication, online collaborative sharing, synchronous video communication, synchronous text communication and the use of social networking sites. A Tukey's HSD was also run on the responses from the question of "Please indicate … how often these components are used at the program course level" to determine if there was a difference between how often each of the components were used at the program course level in the online agriculture programs.

Results and Discussion
Student Survey
Demographics

Thirty-seven percent of the respondents were thesis-option students and 62% were non-thesis. Campus based respondents made up 48.8% of the sample, online 34.1% and mixed campus/online 17.1%. On average (72.5%) they had been enrolled between two and five semesters. Sixty-two percent indicated that they were full time, 37.5% were part time and 55% were on an assistantship. Including the work they may do for their assistantship, 20% of students worked between 1-20 hours a week, 25% between 20 and 40 hours a week and 47.5% indicated that they worked more than 40 hours a week. Fifty-four percent of the students also indicated that the time needed for them to graduate was about what they expected, while 41.5% indicated that it was more than they expected. Finally, out of the sample most (80%) answered that they were White/Caucasian, 61% were female and 39% were male.

Respondents who were campus based students tended to work between 1 and 40 hours a week ($\chi2$ = 20.88, n=31, p=0.001), be in a thesis program ($\chi2$ = 4.47, n=31, p=0.03), be a full time student ($\chi2$ = 10.61, n=31, p=0.001) and have an assistantship ($\chi2$ = 13.78, n=31, p=0.001). On the other hand online students tended to work more than 40 hours a week ($\chi2$ = 20.88, n=31, p=0.001), not be in a thesis program ($\chi2$ = 4.47, n=31, p=0.03), be a part time student ($\chi2$ = 10.61, n=31, p=0.001) and not have an assistantship ($\chi2$ = 13.78, n=31, p=0.001).

Academic and Social Integration

There were significant differences in the mean scores between online, campus based and mixed program students for academic integration and social integration (Table 1). Students who were in campus based and mixed programs scored higher on academic integration than those in the online program, and students in the campus based programs scored higher on social integration. The student's intention to persist did not differ across the program types and overall, the student's indicated a high intention to persist.

To further understand the effects of academic integration and social integration on intention to persist, the constructs for each factor were also analyzed. Within academic integration, research interactions was significantly different across program types with students in online programs having the lowest score (Table 2). There were no differences between program type in mean score for advisor relationship or non-research interactions.

Table 1. Mean scores[z,y], standard deviations and ANOVA for academic integration scores, social integration scores and intention to persist scores by program type.

Program Type		Academic Integration	Social Integration	Intention to Persist
Campus Based	Mean	3.55a[x]	4.22a	5.06
	SD	0.86	0.82	0.71
Online	Mean	2.55b	3.16b	5.07
	SD	1.07	0.79	0.89
Mixed	Mean	3.66a	3.61ab	5.49
	SD	0.58	0.72	0.76
	F	5.98	7.41	0.83
	P-Value	0.005**	0.002**	0.44

** Denotes significance at p=0.01 using ANOVA

[z] n = 42

[y] range of scores are 1 (low) to 6 (high)

[x] Mean separation in rows by Tukey's HSD, *P= 0.01*

Table 2. Mean scores[z,y], standard deviations and ANOVA for academic integration subscale scores for advisor relationship, research interactions and non-research interactions.

Program Type		Advisor Relationship	Research Interactions	Non-Research Interactions
Campus Based	Mean	4.37	3.13a[x]	2.56
	SD	1.81	0.84	0.56
Online	Mean	5.29	1.54b	2.11
	SD	0.40	0.80	0.87
Mixed	Mean	4.99	2.36ab	2.54
	SD	1.37	0.95	0.71
	F	0.98	14.68	1.87
	P-Value	0.39	0.001***	0.168

*** Denotes significance at p=0.001 using ANOVA

[z] n = 42

[y] range of scores are 1 (low) to 6 (high)

[x] Mean separation in rows by Tukey's HSD, *P= 0.01*

Table 3 Mean scores[z,y], standard deviations and ANOVA for social integration subscale scores for peer-group support, interactions with faculty and social interactions.

Program Type		Peer-Group Support	Interactions with Faculty	Social Interactions
Campus Based	Mean	4.36a[x]	4.72	3.07a
	SD	0.81	1.18	1.03
Online	Mean	3.24b	4.02	1.30b
	SD	1.20	1.14	0.48
Mixed	Mean	3.85ab	4.14	2.19ab
	SD	0.92	1.05	0.86
	F	5.45	1.75	17.89
	P-Value	0.008**	0.188	0.001***

, * Denotes significance at p=0.01 or 0.001, respectively using ANOVA

[z] n = 42

[y] range of scores are 1 (low) to 6 (high)

[x] Mean separation in rows by Tukey's HSD, *P= 0.01*

As mentioned above, involvement in research interactions mean scores were different between program types. Within social integration, involvement in social interactions mean scores were also significantly different between the program types (Table 3). This construct dealt with interactions that did not have an academic component such as departmental socials, student get-togethers, or informally meeting with and talking to other students or faculty members.

These differences in involvement in both types of interactions is perhaps not surprising considering that most online students live some distance away from both other students and from the campus where the program is offered. Though the survey asked students to consider both online and face-to-face interactions, it is in some ways not as convenient or easy to be involved in these types of interactions when living at a distance.

For example, distance students do not "see" the other students in the hallway and they cannot physically drop by their offices or the offices of other faculty or staff members or walk to a departmental seminar.

However, participation in interactions, whether social or academic in nature were not the only constructs that were different. Within social integration, a difference in peer group support was also seen (Table 3). Specifically the mean rating for peer group support was lower in the online students than in the campus based students. Considering the lower amount of interactions, this is perhaps not surprising and also perhaps a bit alarming. As mentioned above, social integration involves interpersonal relationships and support (Spady, 1970; Tinto, 1975); and stems from interactions with students peer group, faculty and staff (Tinto, 1975). Also as mentioned above, the diversity of backgrounds and locations that can be present in an online environment may contribute to a lack of interaction and a sense of isolation (Paul and Brindley, 1996).

Perhaps what is most interesting from this survey, were the students in the mixed program. These students had similar academic integration, social integration, peer-group support and social interactions as the campus based students (Tables 1-3). While we do not know how much of the program was online and how much was on campus, these findings suggest that investigating this further to identify just how much of a program needs to be on campus to promote socialization would be useful. Additionally, while there were some differences between the students in the three program types, there were no differences in their intention to persist. Given the statistics on the drop-out rates for students in online programs and courses, this may indicate that the tide has turned, such that our understanding of online teaching and learning is resulting in better learning environments for online students.

Graduate Director Survey
Online Graduate Relationships

Graduate directors of online programs showed a statistically significant difference between the importance assigned to student to student interactions and relationships and director/instructor to student interactions and relationships (Table 4). It can be further concluded that the director/instructor to student relationships were ranked as more important than student to student relationships in an online graduate program (Table 4). This difference may help explain why student interactions with faculty and advisor relationship were not significantly different across program type (Table 2, 3); it is possible that the online programs are designed to insure these interactions occur. This difference may also help explain why differences were seen in both involvement in social interactions and peer group support. If gradu-

ate directors do not consider student to student interactions as important, online programs may not be deliberately designed to incorporate as many interactions between students. This, in turn, could inhibit the development of social presence because peer-to-peer interaction in online environments stimulates and is stimulated by social presence (Moore and Kearsley, 2004). This in turn could affect the support student's feel from their peers because when students participate in interaction, project their identities and feel others presence they become bound together (Gunawardena and Zittle, 1997).

Types of Communication

The program directors were also asked about the use of many methods used today to foster online interaction and communications. Asynchronous text communication and online collaborative sharing were used significantly more often than synchronous video communication and face to face interaction at the programmatic level in an online graduate degree program (Table 5). There was no significant difference in the amount that asynchronous text communication, online collaborative sharing, synchronous text communication and social networking sites were used at the program level.

Asynchronous text communication was used significantly more often than synchronous video communication, synchronous text communication and face to face interaction at the program course level (Table 6). There was no significant difference in the amount that asynchronous text communication, online collaborative sharing and social networking sites were used, at the course level. These results indicate that more communication components are used more often at the programmatic level than the course level. Also at the programmatic and course levels, face-to-face interaction and synchronous video communication methods of communication which allow the people communicating to see others faces and body language, were the least used.

If we consider the idea of social presence – the sense that other people are "real" and the sense of "being together with others" outside of the students immediate environment (Lehman and Simone, 2010) – then the information that synchronous and face-to-face interactions are less used than asynchronous types of communication is important. For one, the process of communicating emotions and feelings is important in communication. Tu and McIsaac (2010) found that in an online environment, plain text may be lacking in stimulation and students find it harder to express the meanings and emotions that they intend and therefore are concerned about misunderstanding others and about other students misunderstanding them. Also response time is crucial in online interaction, So and Brush (2008) found that students reacted negatively to the absence of synchronicity especially as related to the lack of immediate feedback. Tu and McIsaac (2010) also found that if a student did not respond in the time expected or did not respond at all, the sender felt less social presence. Thus So and Brush (2008) suggest two-way synchronous communication and or visual

Table 4. Mann-Whitney U test[z] comparing mean rank responses among Student to Student interaction and relationship and Graduate Director/Instructor to Student interaction and relationship questions.			
	Group	N	Sum of Ranks
Importance of Interactions and Relationships	Student to Student Interactions and Relationships	24	420
	Director/Instructor to Student Interactions and Relationships	24	756
	Total	48	1176***

*** Denotes significance at p=0.001 using Mann-Whitney U test

[z] z = -3.45

Table 5. Differences between mean responses (Tukey's HSD[z,y]) on how often these components were used at the program level.

	Asynchronous Text Communication	Online Collaborative Sharing	Other	Synchronous Text Communication	Social Networking Site	Synchronous Video Communication
Online Collaborative Sharing	1.28					
Other Choice	0.73	0.00				
Synchronous Text Communication	2.36	1.09	0.64			
Social Networking Site	2.77	1.49	0.88	0.39		
Synchronous Video Communication	4.80**	3.48**	2.04	2.32	1.94	
Face-to-face Interaction	4.96**	3.68**	2.21	2.56	2.18	0.31

** Denotes significance at p=0.01 using Tukey's HSD

[z] n = 12

[y] Critical Value 3.07

Table 6. Differences between mean responses (Tukey's HSD[z,y]) on how often these components were used at the program course level.

	Other Choice	Asynchronous Text Communication	Online Collaborative Sharing	Social Networking Site	Synchronous Text Communication	Synchronous Video Communication
Other Choice						
Asynchronous Text Communication	0.39					
Online Collaborative Sharing	1.52	2.74				
Social Networking Site	1.59	2.84	0.17			
Synchronous Text Communication	2.09	3.91*	1.31	1.12		
Synchronous Video Communication	2.37	4.42*	1.91	1.71	0.61	
Face-to-face Interaction	2.54	5.18*	2.38	2.15	0.94	0.26

* Denotes significance at p=0.05 using Tukey's HSD

[z] n = 12

[y] Critical Value 3.08

and auditory cues as better types of communication to encourage interaction. These types of interaction in turn can help to create an environment where students can give and receive support from their peers and feel more integrated.

Summary

Academic and social integration have been shown to be important factors in graduate student persistence (Church, 2008; Gardner, 2008, 2010; Tinto, 1993; Valero, 2001). The findings of this study illustrate some differences in integration between campus based and online students in College of Agriculture programs, specifically that campus based students are more involved in research and social types of interactions than online students. Students in online programs are also less likely to feel supported by their peers. Though this study cannot determine the directionality of this relationship, the idea of social presence which both stems from interactions with other students (Moore and Kearsley, 2005) and helps make interactions meaningful and engaging (Rourke et al., 2001) may be useful in understanding the results. These results also showed that though graduate directors of online Agriculture programs consider director/instructor to student relationships important, they do not consider student to student relationships as important. This combined with the results showing that asynchronous text communication is used more frequently than synchronous forms of communication illustrate that perhaps there is a deficiency of social presence between students in online Agriculture programs, which could be playing a role in online student's levels of integration in their programs.

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