International Journal of Agricultural Science, Research and Technology in Extension and Education Systems (IJASRT in EESs)
Available online on: http://ijasrt.iau-shoushtar.ac.ir/
ISSN: 2251-7588 Print
ISSN: 2251-7596 Online
2015: 5(1):53-64

Received: 12 January 2015
Reviewed: 24 April 2015
Revised: 30 April 2015
Accepted: 21 May 2015

The Potential of Blended Learning in Agricultural Education of Ireland

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Keywords: Blended Learning, ICTs, Interactive Learning Environments, Technology Adoption

Abstract

The management of agricultural education faces on-going challenges to deliver current and effective materials in an approach that takes advantage of developments in education technology. In this article the use of blended learning was compared with the traditional approach for the instruction of theoretical materials in agricultural education. This study used a pre-test, post-test experimental design with agricultural college students. All students were taught using either a traditional or blended methodology. They were subsequently assessed to determine their level of knowledge. Two key findings from this study were highlighted: Firstly, regardless of their age profile all learners achieved significantly better exam results following blended teaching for theoretical material. Secondly, academically weaker students performed significantly better following the blended method of delivery. Key implications arising from this research indicate that the use of the blended method of delivery can increase students acquisition of knowledge for learners of all ages; blended learning can bring text heavy materials to life and makes them more interactive and less mundane; the learning experience and learning outcomes for academically weaker students are improved through the blended learning environment.

1. Introduction

Management in agricultural colleges faces new challenges to develop and refine strategies that have the potential to enrich agricultural education. Continued developments and innovations now place technology at the heart of knowledge transfer and delivery. According to Beastall (2006) Information and Communication Technologies (ICTs) are revolutionizing education. By removing distance and making knowledge more accessible, the introduction of technology allows for greater flexibility to adapt teaching and learning, meeting learners' cognitive and learning styles. In this research two specific areas of management will be examined; the management of student and professional learns and management of current policy and practice including curriculum design and implementation – specifically assessing the potential of blended learning in comparison to that of the traditional method of delivery for agricultural education. While the use of ICT in distance learning for off-campus students is already accepted, Flynn & Campbell (2005) stated that there is also a trend in higher education to utilize the benefits of e-learning to improve the learning performance of campus-based students. Implementing technology in education is complex, shaped by pedagogical philosophies, curricular requirements, and the proliferation of ICT in society at large (Granger, Morbey, Lotherington, Owston & Wideman 2002). Watkins and Mortimore (1999) offered a definition of pedagogy as 'any conscious activity by one person designed to enhance learning in another'. Good pedagogical design needs to express the congruence between the content, teaching strategies, learning environment, assessment and feedback, and reflect underlying theories of learning and value (Hudson, 2011; Kalantzis & Cope, 2010; Mayes & de Freitas, 2007).

Tornatzky and Klein, (1982) analyzed the relationship between the characteristics of an innovation and its adoption, finding that compatibility, relative advantage, and complexity had the most significant relationships with adoption across a broad range of innovation types. The fact that training is a part of any ICT development process is widely recognised, but more than just training and access to resources is required if results are to be achieved from investment in ICT. The need for a better understanding of the process of training in the use of ICT is also widely accepted (Caley & Hendry, 1998; Jones & Robinson, 1998; Wu, Tennyson & Hsia, 2010; Matzat, 2013). Reports indicate that education through e-learning is more effective because it enhances the learning process, increases retention, saves time and money, provides more privacy, readily accomplishes study goals, gives control to the learner, imposes no limit on the number of learners, open entry and exit, adjusts with the learner's pacing and content, keeps a record of the learner, is flexible in terms of schedule, is consistent in terms of contents, and saves on lecture time (Askov & Clark, 1991; Kulik, Kulik & Shwalb 1986; Swann, Branson & Talbert 2003; Williamson & Smoak, 2005; Porter, Graham, Spring & Welch 2014).

1.1 Evaluation of educational systems - Blended Learning

In educational settings, the term blended learning is defined in various ways. Generally, blended learning is viewed as the integration of face-to-face and online learning, focusing on the use of internet-based technologies, such as emphasising the role of online activities for extending and developing face-to-face learning (Graham, 2006). Bliuc, Goodyear & Ellis (2007) describes blended learning as learning activities that involve a systematic combination of co-present interaction and technologically-mediated interaction between students, teachers and learning resources. It refers to situations where an instructor personally interacts with learners during occasional face-to-face meetings, but the vast majority of learning occurs via Web-based distance learning where the learner interacts with course materials, the instructor, and other trainees using Web-based electronic media (Klein, Noe & Wang 2006). According to MacDonald (2006) the main components of blended learning are (1) campus-based with a blend of asynchronous interaction providing more flexibility, (2) distance education with a blend of networking technologies to provide collaborative and synchronous communication with occasional possibilities of face-to-face interaction, or (3) blended learning courses that offered interaction between a combined cohort of campus-based and distance students. Blended learning has been considered as an important alternative approach to overcome various limitations of both face-to-face and online learning, because the blended learning approach adopts the advantages of both types of learning (Schlager, Fusco & Schank 2002).

For the purpose of this paper the term blended learning is simply defined as a combination of the best features of traditional face-to-face teaching and online instruction to enhance teaching and learning. In order to uncover the potential of blended learning in agricultural education the following research objectives were formulated; (1) to compare the effectiveness of traditional and blended methods of teaching in the instruction of theoretical materials in agricultural education, (2) to investigate the influence of agricultural students' personal characteristics and performance with online materials versus that of traditional materials and (3) to investigate the extent to which online materials are appropriate to different subject matter.

1.2 Management of student and professional learning

Education continues to develop and institutions now realize that the 'one size fits all' approach to teaching and learning is not viable or realistic (Robinson, 2010). It has been cited by numerous scholars (Venkatesh & Morris, 2000; Selwyn, 1999; Myer & Halpin, 2002) that positive attitudes towards ICTs are widely recognized as a deciding factor for effective implementation of ICTs in education. Educators perceive that ICT might be important in their work for three different reasons, which themselves can be in tension. ICT can be perceived as a social and cultural phenomenon; as a resource for learning and teaching; and as a new field of concepts and affordances for learning and teaching. The challenges to pedagogy lie in the weaving together of these three perceptions (Loveless, 2011). Loveless (2011) also states that preparing and planning the use of ICT to enhance learning and teaching requires an understanding of how ICT tools might support design for learning in particular subject content areas as well as in general processes, roles and strategies in learning and teaching.

Educators need to relate examples of 'good practice' to the reality and materiality of their own contexts and experiences, and Selwyn (2008) reminds us that it is important to try to understand the 'state of the actual' and recognise different ways in which we might look at educational technology and its place in learning and teaching. A predominant challenge to

the introduction of new media in education has been the dominant force of the instructive pedagogy that historically has placed emphasis on the teacher's one way delivery of subject matter. This stands in contrast to the cognitive pedagogy that places emphasis on the psychological engagement with students, teachers and subject matter for cognitive and affective performance (Schifter & Stewart, 2010). The internet and online technologies have the potential to both enhance and optimise the learning experience but with the implementation of these new innovations new challenges will arise in coping with disruptions and distractions in the classroom (López-Pérez, Pérez-López & Rodríguez-Ariza 2011).

1.3 Management of current policy and practice including curriculum design and implementation

Theoretical Framework (Khan's Octagonal Framework)

According to Singh (2003) Khan's Octagonal Framework serves as a guide to plan, develop, deliver, manage and evaluate blended learning programmes. The model has eight dimensions which should be considered for effective learning delivery in a blended learning environment including pedagogical, technological, interface design, evaluation, management, resource support, ethical and institutional dimensions.

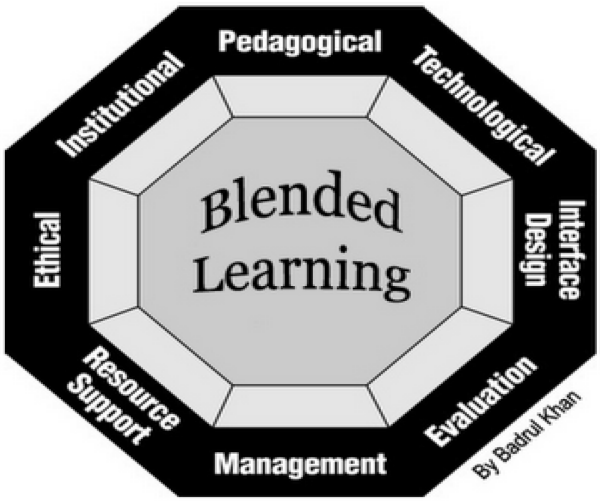

Figure1. Khan's Octagonal Framework for Blended Learning
Source: (Khan, 1997)

With reference to Khan's Octagonal framework the learning materials used in this research were planned, developed, tested and evaluated in both the traditional and blended learning environment.

Khan (1997) describes each of the eight dimensions as follows;

Pedagogical: Refers to the teaching and learning. This dimension addresses issues surrounding course content, target audiences, goal and media analysis; design approach; organisation and methods and strategies of e-learning environments. *Technological*: Looks at the technological infrastructure in blended environments, what is required, what hardware and software are needed? *Interface design*: The interface design dimension encompasses page and site design, content design, navigation, and usability testing. *Evaluation*: This includes the assessment of learners, and evaluation of the instruction and learning environment. *Management*: Is concerned with the maintenance of learning environment and distribution of information. *Resource support*: Examines the online support and resources required to foster meaningful learning environments. *Ethical*: Relates to social and political influence, cultural diversity, bias, geographical diversity, learner diversity, information accessibility, etiquette, and the legal issues. *Institutional*: Issues of administrative affairs, academic affairs and student services related to e-learning

This research was conducted in a state agricultural college in Ireland. The use and effectiveness of blended learning were evaluated in comparison to that of traditional approaches. Module specifications and all curriculum were reviewed with learner needs defined. Two modules were chosen (Animal Production Science and Introduction to Agri-Business) due to their diverse nature and a work strategy was developed. It was important during this process to remember how e-learning is different from traditional teaching. The Learning Management

System Moodle was chosen for use during the research, with the interface design dimensions being sophisticated enough to integrate materials but user friendly in the navigation throughout the content.

A pre-test was used to record students' prior knowledge on subject matter, with students allocated to one of four new groups based on their knowledge. The students had 30 minutes to complete the pre-test, after which these were graded in to three categories by a panel of experienced agricultural teachers. Each paper was graded on a three point scale; a score of 1 indicating that the student's knowledge was Poor/Fair; a score of 2 indicated that the student's knowledge was Satisfactory; and finally a score of 3 indicated that the student's knowledge was Good/Very Good. Following analyses it was found that each new group required the approximate representation of 3:6:1 (Poor/Fair: Satisfactory: Good/Very Good students). In order to evaluate the effectiveness of both the instruction and the learning environment a small section of material was piloted with 15 students followed by a focus group discussion. As no issues were highlighted no additional changes were required. The learning environment, development and distribution of information were managed throughout this research by the class tutor. To ensure that students were able to logon to the computer and access their personal Moodle page themselves during the trial each student was given a short computer tutorial.

All students experienced both types of learning during this study. For example if new group completed the Introduction to Agri-Business using the traditional method then they would complete the Animal Production Science using the blended method of teaching and learning. Using the traditional method of teaching students were taught in a classroom based setting with the teacher at the centre disseminating information to students. This method involved the use of power-point presentations, chalk and talk blackboard discussions and use of the course workbook. The class lasted approximately 45 minutes during which time students had the opportunity to ask questions. Students were assessed using a written exam at the end of each class. Using the blended method of teaching students were taught in a computer lab setting. Each student had access to individual computers and had a personal Moodle account. A teacher gave instructions to the students at the beginning of the class. The students then had 45 minutes to work through the course material themselves at their own pace. Materials included online presentations displayed in a linear format with the option to return to 'previous sections' or to advance to the 'next section' when the student felt ready. Other materials included graphics, diagrammatic aids and pictures. The teacher facilitated a short question and answer session to resolve any issues or questions the students may have had in relation to the course material. Students were assessed using an online exam after the class session. During this time all course materials and revision aids which were previously available to the students were removed from the platform with only the online exam remaining.

To avoid bias the same teacher taught the material in both the traditional and blended environments. The same course materials were covered in both forms of teaching and learning with materials delivered in different ways.

2. Materials and methods

There are six agricultural colleges in Ireland providing vocational agricultural education with a total of 83 teachers and on average 600 students are enrolled in the full time level 5 certificate in agriculture each year (Teagasc, 2013). The level 5 certificate in agriculture curriculum includes a combination of theoretical classroom based sessions with a comprehensive practical skills component. Students are also required to carry out a 12 week practical learning period on an approved training farm.

Kildalton Agricultural College, the largest in Ireland, has an average annual intake of 130 students. Thus this college was selected in order to provide an accurate representation of the student population. This study took place over a two academic year period using a pre-test, post-test experimental design. The research used a mixed methodology incorporating components of both quantitative and qualitative approaches. Triangulation strengthens a study by combining both quantitative and qualitative methodologies and is used to improve the validity and reliability of research (Patton, 2002). In this study triangulation, colleague examination and piloting of materials were used to increase trustworthiness (Merriam, 1995). Appropriate tests were developed to measure the dependent variables including an attitudinal survey, pre knowledge assessment, development / utilisation of blended materials, development of post testing assessment sheet and key observations.

Figure 2 illustrates the research design and conduct of the study.

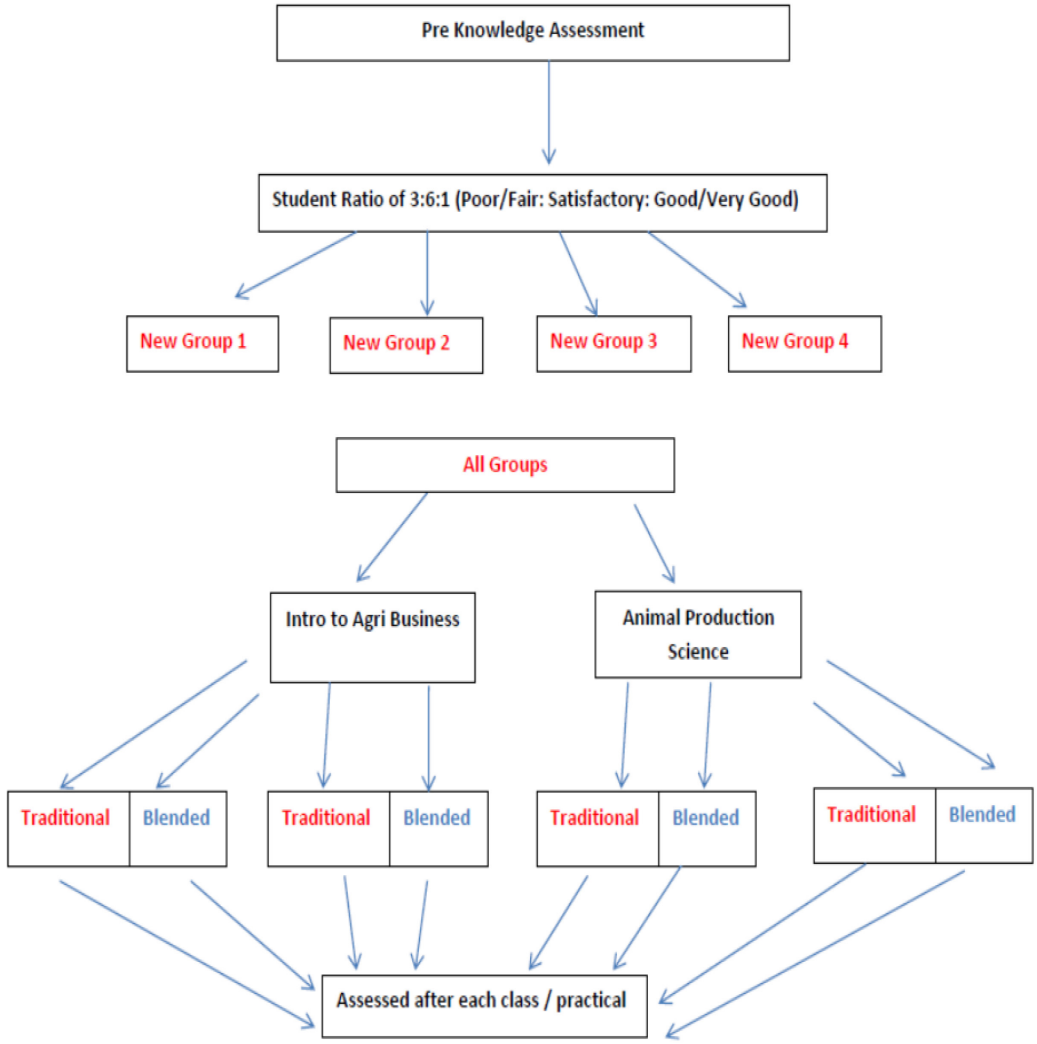

Figure 2. Conduct of the Study

A pre-test, post-test experimental design hypothesizes that score gains after a week, reflect real changes in the underlying construct that are accurately assessed by the test. Lievens, Reeve & Heggestad (2007) state that there should not be measurement bias or predictive bias, because retest scores reflect the same underlying construct to the same degree as do initial test scores. Both pre and post-test scores reflect individual differences in the target ability. This type of test is a viable possibility for assessments whose variance is primarily attributable to physical skills, acquired cognitive skills, declarative knowledge, or memory tests (Lievens, Reeve & Heggestad, 2007). The quantitative data were entered into the Statistical Package for the Social Sciences (SPSS 18.0® for Windows) and analyzed using the data manipulation program. Descriptive statistics (frequency distribution, percentages, measures of central tendency and variability) were used to describe the data. Cross-tabulations, correlations and T-tests were used to examine relationships between variables.

Profile of Respondents

Analysis of the personal characteristics of the respondents in this study indicated that respondents were similar in all respects to the population from which they were drawn. This allows confidence in the findings of this research. Table 1 features the profile of student respondents. It is clear from Table 1 that overall students had a positive attitude towards technology and technology adoption with over 80% of students in both years stating they had good basic computer skills.

Table1. Profile of Respondents

	Year 2012	Year 2013
Student Age Range	16 – 29	17 – 30
Average Age	19	19
Male	98%	99%
Completed Leaving Certificate Examination**	85%	92%
Home Farm Enterprise	Dairy (44%)	Dairy (45%)
	Other (56%)	Other (55%)
Home Farm Size	<50Ha (44%)	<50Ha (51%)
	>50Ha (56%)	>50Ha (49%)
Interest in taking an online class	49%	46%
Have good basic computer skills (Self Assessed)	85%	81%
How did you learn to use a computer	Self (37%)	Self (36%)
	Family/School (63%)	Family/School (64%)
Find working with computers interesting	68%	72%
Unsure about working with technology	27%	20%
Don't like working with Computers	14%	21%

Note **terminal state examination system in Ireland

Table2. The relationship between method of teaching and assessment scores achieved for Animal Production Science and Introduction to Agri-Business (n=213)

	Traditional		Blended			
	Mean Score (%)	SD	Mean Score (%)	SD	t-test	Sig
Animal Production Science	86.54	16.996	87.26	13.489	0.732	ns
Introduction to Agri-Business	76.70	25.862	86.62	10.424	0.000	Sig

ns = Not Statistically Significant, at p= <0.05. Sig= Statistically Significant. SD= Standard Deviation.

3. Results and discussion

Knowledge was measured using a post-test examination following either method of teaching. The results in Table 2 focus on the effectiveness of both traditional and blended methods of teaching for both theory based subjects (Animal Production Science and Introduction to Agri-Business) over a two academic year period.

No significant differences were found when comparing method of teaching with the assessment scores achieved for Animal Production Science indicating neither method to be superior. This finding suggests that the blended method of teaching to be equally as effective as the traditional method of teaching for the instruction of Animal Production Science. A statistically significant difference was found however when comparing method of teaching and the assessment scores achieved in Introduction to Agri-Business highlighting the blended method of teaching to be more effective than traditional instruction.

Although it was a noteworthy finding to discover the effectiveness of the blended method of teaching in the delivery of diverse theoretical content, further analysis was warranted. The personal characteristics of the students and their effect of the acquisition of knowledge using different teaching methods were considered. Independent sample t-tests were utilized in order to analyze the data. Personal characteristics including age and academic ability were examined and the results are presented in Table 3. The mean score achieved is recorded as a percentage. Student age was divided into two groups. Those under the age of eighteen were classed as the young group and those over the age of eighteen were classed as the older group. Academic ability was assessed in the form of the Leaving Certificate Examination which is the terminal state examination system in Ireland. Those achieving below average results were considered academically weak. Students achieving above average results were considered to be academically strong.

Statistically significant differences were highlighted when examining personal characteristics of the students and their effect of the acquisition of knowledge using different teaching methods. Significantly higher assessment scores were achieved in Introduction to Agri-Business following the blended method of teaching for the young group (P=0.000), and the older group (P=0.001).

Statistically significant differences were also highlighted in favour of the traditional method of teaching in Introduction to Agri-Business for students with above average results in the Leaving Certificate

(P=0.003). Significantly higher assessment scores were achieved in both Animal Production Science (P=0.015) and Introduction to Agri-Business (P=0.001) following the blended method of teaching for those with below average results in the Leaving Certificate.

No significant differences were found when comparing the personal characteristics of age with the acquisition of knowledge using different teaching methods for Animal Production Science. Table 3 looks further at the relationship between students' personal characteristics and the acquisition of knowledge using different teaching methods. Statistically significant differences were found indicating the potential for blended learning, with significantly higher assessment scores achieved following this method of teaching for Introduction to Agri-Business for those students that would prefer normal classes (P=0.033), for those students that would like to take an online class (P=0.000), those who feel they have good basic computer skills (P=0.000) and those who find working with computers interesting (P=0.000).

Statistically significant results were also found with significantly higher assessment scores achieved in Introduction to Agri-Business favouring the traditional method of teaching for those students that stated they were unsure about working with technology (P=0.004) and students who stated they did not like working with computers (P=0.002). An interesting statistically significant difference was found when examining personal characteristics of the students and their effect of the acquisition of knowledge using different teaching methods, highlighting the significantly higher assessment scores achieved in both Animal Production Science (P=0.038) and Introduction to Agri-Business (P=0.001) following the blended method of teaching for those that were self-taught in computer usage. No significant differences were found when comparing the personal characteristics of; interest in taking an online class, their computer skills and their attitude towards working with computers with the acquisition of knowledge using different teaching methods for Animal Production Science**.**

Table 3. The Relationship between students' personal characteristics and the acquisition of core knowledge with method of teaching used

			Animal Production Science				**Introduction to Agri-Business**			
Question	Personal Characteristics	Method	Mean Score (%)	SD	t-test	Sig	Mean Score (%)	SD	t-test	Sig
Q1. Age	Young Group <18 (n=119)	Traditional	87.50	10.676	0.988	Ns	76.92	22.416	0.000	Sig
		Blended	87.45	18.624			89.73	9.007		
	Older Group 18+ (n=94)	Traditional	86.59	11.846	0.794	Ns	72.61	26.880	0.001	Sig
		Blended	85.74	18.852			88.28	11.064		
Q2. Leaving Cert Results**	Below average results (n=50)	Traditional	77.36	13.679	0.015	Sig	60.44	39.546	0.001	Sig
		Blended	87.53	13.654			87.53	7.805		
	Above average results (n=53)	Traditional	87.50	10.408	0.234	Ns	90.84	8.976	0.003	Sig
		Blended	80.00	31.091			72.35	26.493		
Q3. Interest in taking an online class	Would prefer normal class (n=80)	Traditional	88.3784	11.183	0.439	ns	77.7609	22.190	0.033	Sig
		Blended	85.3488	21.308			86.6421	10.260		
	Would like to take an online class (n=95	Traditional	86.8000	10.961	0.532	ns	73.1602	25.657	0.000	Sig
		Blended	88.2222	13.532			91.1854	9.518		
Q4. Have good basic computer skills	Agree (n=178)	Traditional	87.0787	11.599	0.714	ns	76.0975	22.782	0.000	Sig
		Blended	87.8852	16.546			87.8852	10.089		
Q5. How did you learn to use a computer	Self-taught (n=78)	Traditional	85.2778	13.198	0.038	Sig	74.3597	24.395	0.001	Sig
		Blended	90.7143	9.472			89.1936	9.619		
	Family/School (n=134)	Traditional	84.2857	12.724	0.930	ns	87.1800	8.598	0.145	ns
		Blended	83.7500	10.606			80.7750	6.441		
Q6. Find working with computers interesting	Agree (n=149)	Traditional	87.0270	11.554	0.702	Ns	75.9751	23.846	0.000	Sig
		Blended	88.0000	18.599			89.2525	10.391		
Q7. Unsure about working with technology	Agree (n=49)	Traditional	86.3636	12.552	0.607	ns	89.2300	9.930	0.004	Sig
		Blended	88.8889	19.871			70.8342	28.601		
Q8. Don't like working with computers	Agree (n=37)	Traditional	90.0000	8.164	0.208	ns	89.8609	9.002	0.002	Sig
		Blended	84.2857	16.300			64.6180	34.745		

Note. ns = Not Statistically Significant, at p= <0.05. Sig= Statistically Significant at p= <0.05. Note. SD=Standard Deviation. Total score achieved is in percentages. Leaving Cert Results** Terminal State Examination System in Ireland.

Revising and developing management strategies that aid in the successful transfer of knowledge is essential in the agricultural college setting. This research focused on the comparison of blended and traditional delivery methods and the impact on student learning. Rosenberg (2006) asserted that blended learning is not just a mixture of classroom and online courses, but that it is a holistic architecture of a learning and performance solution. According to Elwood (2005) blended learning includes multiple methods of instructional delivery such as self-paced, asynchronous, online learning, face-to-face, instructor-led classes, and on the job activities. Similar delivery approaches were used in this research to uncover the potential of blended learning in agricultural education.

When the effectiveness of blended teaching was compared against traditional teaching in the delivery of Animal Production Science material, no significant difference was found. This is a significant finding, identifying blended learning to be equally as effective as that of traditional instruction. A statistical significance was highlighted however, when comparing blended teaching with traditional classroom delivery for Introduction to Agri-Business in favour of blended teaching methods. Both of these findings highlight the many benefits which can be exploited using the blended method of delivery including; giving control to the learner in a self-paced environment, offers more privacy, imposes no limits on the student numbers, records learner activity and allows the learner to readily accomplish study goals.

Bersin (2004) reported that there are indications that blended learning results in better retention, while Graham (2006) shared that increased access to virtual learning and the flexibility and convenience learners have in blended learning help propel the growing implementation of blended learning programmes.

Student demographics were considered to see if there was a significant link between students' personal characteristics and exam results achieved following both methods of teaching. Detailed analysis found students achieved significantly knowledge retention in Introduction to Agri-Business following the blended method of teaching regardless of their age category. Academically weaker students performed significantly better following the blended method of teaching for both subject types. This finding again highlights one of the many benefits to utilizing blended learning. Graham (2006) said that one of the most stated reasons for blending learning is more effective pedagogical practices, where the level of active learning strategies are increased. A blended learning environment makes sense as it appeals to the needs and learning styles of a variety of trainees (DeRouin, Fritzsche & Salas, 2005). Additionally, Bersin (2004) states through the use of online learning (and reporting through an LMS) results are improved because the specific needs of the learners are aligned to the programme.

The effectiveness of the blended learning environment was also highlighted with significantly knowledge retention achieved in Introduction to Agri-Business for students that indicated that they find working with computers interesting, those who felt they have good basic computer skills and those who would like to take an online class. Not surprisingly students that were unsure about working with technology or who stated that they did not like working with computers performed significantly better in Intro to Agri-Business following traditional teaching.

The investigation into the diverse nature of theoretical material in agricultural education to uncover what subject type is most and least suitable for blended delivery was the concluding component of this research. Rosenberg (2006) noted that with the right instructional design approach, almost any type of knowledge or skill can be developed and delivered online. Although a significant difference was highlighted with students achieving higher knowledge retention following the blended method of teaching for both subject types the blended environment appeared to be more successful in the teaching of Introduction to Agri-Business in this study. Singh (2006) asserted that blended learning is not just mixing and matching a variety of instructional methods and delivery modes. Rather to be successful, blended learning needs to focus on combining the right delivery technologies to match the individual learning objectives and transfer the appropriate knowledge and skills to the learner at the right time. In this study the blended environment transformed the text heavy mundane nature of the Introduction to Agri-Business subject. While the same materials were available in both methods of teaching, the interactive and self-paced environment provided by the blended method of teaching allowed students to perform to their full potential.

4. Conclusion and recommendations

Dziuban, Hartman, Juge, Moskal & Sorg (2006) discussed how advances in computer technologies and the Internet, combined with significant research in new learning theories, have helped fuel exploration and research on how to best use these technologies to improve teaching and learning. Although numerous studies have highlighted the benefits of blended learning its potential remains overlooked in many educational institutions globally.

The results in this study revealed the comparative effectiveness of the blended method of teaching as a successful strategy to enrich agricultural education. This is reflected in the similar results achieved in Animal Production Science and the significantly higher exam results achieved in Introduction to Agri-Business following the blended method of teaching.

With student demographics in all educational institutions constantly changing, two key finding from this study were highlighted; Firstly, regardless of their age profile all learners achieved significantly better exam results following blended teaching for Introduction to Agri-Business. Secondly, academically weaker students performed significantly better following the blended method of teaching of both subject types.

Key implications for the management of agricultural colleges and education practitioners arising from this research indicate that the use of blended learning can increase knowledge retention for learners of all ages; blended learning can bring text heavy material to life and makes it more interactive and less mundane; the learning experience and learning outcomes for academically weaker students are improved through the blended learning environment.

On the basis of the findings in this study, it can be concluded that the blended method of delivery is an effective tool in the transfer of agricultural knowledge. Thus it has the potential to be incorporated as an effective strategy to enrich agricultural education.

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مجله بین‌المللی علوم، تحقیقات و فناوری کشاورزی در نظام‌های آموزش و ترویج
قابل دستیابی در: http://ijasrt.iau-shoushtar.ac.ir/
شاپا نسخه چاپی:۷۵۸۸-۲۲۵۱
شاپا نسخه برخط: ۷۵۹۶-۲۲۵۱
۲۰۱۵: ۵(۱): ۵۳-٦٤
۲۲ دی ۱۳۹۳ :دریافت نسخه اولیه
۱٤ اردیبهشت ۱۳۹٤ :ارسال پاسخ داوری
۱۰ اردیبهشت ۱۳۹٤ :دریافت نسخه اصلاحی
۳۱ اردیبهشت ۱۳۹٤ :پذیرش

پتانسیل یادگیری ترکیبی در آموزش کشاورزی کشور ایرلند

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چکیده

مدیریت آموزش کشاورزی برای ارائه مواد آموزشی فعلی و مؤثر بر اساس رهیافت توسعه در فناوری‌های آموزشی با چالش‌هایی مواجهه است. در این مقاله کاربرد یادگیری ترکیبی با رهیافت سنتی در آموزش موضوعات نظری در آموزش کشاورزی مورد مقایسه قرار گرفته است. این مطالعه یک طرح آزمایشی پیش‌آزمون- پس‌آزمون را مورد استفاده قرار داده‌است. به همه دانش آموزان با استفاده از یک روش سنتی یا ترکیبی آموزش داده شد. آنها سپس به منظور تعیین سطح دانش، مورد ارزیابی قرار گرفتند. دو یافته کلیدی در این مطالعه مورد تأکید قرار گرفت. تمام فراگیران که از طریق آموزش ترکیبی آموزش دیده بودند، نتایج آزمون آنها بهتر بود. همچنین، دانشجویانی که از نظر علمی ضعیف‌تر بودند به طور معنی‌داری آموزش‌های ترکیبی را ترجیح می‌دادند. نتایج کاربردی این تحقیق نشان می‌دهد که کاربرد روش‌های ترکیبی می‌تواند باعث افزایش کسب دانش در تمام سطوح سنی دانشجویان شود. یادگیری ترکیبی می‌تواند متون سخت آموزشی را با زندگی انسان مرتبط کند و یادگیری تعاملی ایجاد نماید. همچنین، تجربیات و نتایج یادگیری برای دانشجویان ضعیف‌تر از نظر علمی، از طریق محیط یادگیری ترکیبی بهبود داده شود.

کلمات کلیدی:
یادگیری ترکیبی، فناوری اطلاعات و ارتباطات، محیط یادگیری تعاملی، پذیرش فناوری