BJET | British Journal of Educational Technology | BERA

Approaches to teaching online: Exploring factors influencing teachers in a fully online university

Journal:	*British Journal of Educational Technology*
Manuscript ID	BJET-0156-May-2015-OMS.R3
Manuscript Type:	Original Manuscript
Date Submitted by the Author:	n/a
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Keywords:	Approaches to teaching online, Teachers' roles in teaching online, Virtual learning environments, Fully online university

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Approaches to teaching online: Exploring factors influencing teachers in a fully online university

Abstract

In recent years there has been widespread interest in the implementation of online courses in universities. While most studies about online learning environments primarily focus on technology-related issues or instructional methods, little attention has been given to online teachers and their teaching approaches. The aim of this paper is to provide an overview of how teachers approach online teaching and the factors affecting individual teachers' approaches to teaching online, particularly in a fully online university. Nine hundred and sixty-five (965) online teachers belonging to the Open University of Catalonia were surveyed. The dependent variables include three approaches to teaching online: the *Content Acquisition* approach, the *Collaborative Learning* approach, and the *Knowledge Building* approach. The explanatory variables are socio-demographics, academic background, online teaching experience, studies taught, online teaching dedication, and teachers' roles in teaching online. Multiple regression analyses are used to make inferential judgements and test the effects of the independent variables. Findings suggest that age, academic background, online teaching dedication, and especially teachers' roles in teaching online are important predictors of the adoption of a particular approach to teaching online.

Keywords: approaches to teaching online; teachers' roles in teaching online; virtual learning environments; fully online university.

Introduction

Teaching presence is a key aspect of the educational quality of online studies (Shea, Li, & Pickett, 2006). Teaching presence includes developing curriculum content, learning activities, and timelines; monitoring and managing collaboration; and ensuring that students reach their learning outcomes. Teachers' approaches to teaching are an appropriate concept for characterizing different kinds of teaching presence. According to Trigwell and Prosser (2004; p. 413), teachers' approaches to teaching "were constituted in terms of the strategies they adopt for their teaching and the intentions underlying the strategies".

In the field of technology-enhanced learning, *approaches to teaching online* has been a little-explored topic, both in blended learning and in online education research. The most widely investigated themes were related to *technology environments and applications*, *instructional methods,* and *learning processes* (Badia, 2015).

Increasing our knowledge of approaches to teaching online is relevant for teacher training, as the way teachers consider online teaching is clearly associated with higher-quality student learning processes and outcomes (Shea, Li, & Pickett, 2006). Besides, this knowledge may benefit developers to design online learning environments, and it can also help to design programs to prepare faculties to teach online in order to understand and adapt them to the proper use of these new learning environments.

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The research carried out to date on approaches to teaching online has been conducted both in blended learning courses – in which teachers are expected to balance their teaching between face-to-face and virtual learning environments – and in online courses. Phenomenographic methods have been those most commonly used to collect and analyse data, and as a result, research findings have typically been qualitative.

The pioneer study carried out by Roberts (2003) analysed teachers' approaches to the use of the Web for learning and teaching in blended environments. Using a mixed methodology that combined data from questionnaires and interviews from 256 participants, three different approaches were identified: a) the Web used as a source of subject information, which would be used to promote some form of interaction between the learner's existing knowledge and new information; b) the Web used independently of other learners or the teacher, for individual, self-paced learning; and c) the Web used for group analysis, decision making and dialogue.

As regards blended teaching settings, Ellis, Steed and Applebee (2006), and Ellis, Hughes, Weyers and Riding (2009), analysing data from 19 teachers' interviews, identified four approaches to teaching online in a virtual learning environment. In the approach called "to manage student activity", teachers focused on whether students had successfully completed the learning task following the instructions. In the second category, called "trying things out", teachers encouraged students to experiment with resources in order to learn with new technologies. With the third approach, "integrating experiences of teaching", teachers wanted to leverage the benefits of the online learning context to support students' acquisition of knowledge and their gaining of a better understanding. Finally, in the fourth category, called "to encourage students' autonomy in learning", teachers tried to help the students to take more responsibility for their learning, creating situations in which students could take the initiative through their engagement in research and inquiry.

More recently, Lameras, Levy, Paraskakis and Webber (2012) conducted phenomenographic research, interviewing 25 Computer Science teachers who used virtual learning environments in a blended university. Approaches to teaching online were described as a means to support: a) teachers transferring information to students, who received the information, found the material, and memorized its content; b) teachers promoting application and clarification of concepts, providing knowledge through examples and online exercises, discussing with students, giving feedback, and proposing different ways of thinking; c) teachers supporting the exploration of content resources, the exchange and development of ideas through educational interactions, and sharing knowledge among students; and d) teachers supporting collaborative knowledge creation among the online community of students and the development of process awareness and skills.

In an effort to define how teachers envision teaching in online courses, Gonzalez (2009), taking into account previous contributions from Roberts (2003), conducted research in online courses in Health Sciences. Using a phenomenographic perspective, he collected data from 7 teachers and suggested three approaches to teaching online: a) the Web used for individual access to learning materials and information, and for individual assessment; b) the Web used for learning-related communication (asynchronous and/or synchronous) – teachers provided the content and set up spaces to facilitate educational interactions among students; and c) the Web used as a means for networked learning. Teachers mainly

set up virtual spaces to share information with students and guided the students' knowledge construction process. In a further contribution, Gonzalez (2010) interviewed 18 university teachers from two research-intensive campus-based universities, and made an alternative proposal with four approaches to teaching using e-learning: a) e-learning as a means to provide information; b) e-learning as a means for occasional communication; c) e-learning as a means to engage in online discussions; and d) e-learning as a means to support knowledge-building tasks.

Also related to online courses, Jelfs, Richardson and Price (2009) developed a questionnaire to investigate conceptions of a "good tutor". They identified four approaches to teaching: a) student-oriented; they expected tutors to be concerned with promoting learning through supporting students rather than through their grasp of the subject matter; b) knowledge-oriented; they expected tutors to be concerned with promoting learning through knowledge transfer; c) task-oriented; they expected tutors to be concerned with promoting learning, they had no specific expectations about how this might be achieved); and d) impersonal approach, not focused.

In summary, the abovementioned studies indicate six different kinds of teachers' approaches to online teaching (see Table 1), both in fully online and blended environments: 1) managing learning tasks; 2) promoting self-learning; 3) facilitating content acquisition; 4) supporting knowledge-building; 5) supporting collaborative learning; and 6) creating community and networked learning.

[Table 1]

Factors influencing the adoption of approaches to teaching online

Little research has been done on the factors that may be affecting teachers' adoption of approaches to teaching online, both at a contextual and individual teacher level.

Gonzalez (2009) showed that some contextual aspects, such as specific faculty policies, students' characteristics and curriculum development, have an impact on the online teaching approach adopted. In regard to faculty policies, teachers distinguished positive influences, such as the possibility of holding online teaching workshops and technical support received by the institution, and negative influences, such as the failure of the institution to recognise the extra workload related to online teaching. Some students' characteristics, such as the level of maturity and engagement in the learning process, and curriculum development, such as the way the course was designed and the learning activities planned, were also important factors that affected the adoption of a particular approach to teaching online.

There are more teachers' individual characteristics that may also influence approaches to teaching online. Jelfs, Richardson and Price (2009) pointed out that online teachers, with various academic backgrounds, showed different approaches to teaching online. For example, whereas Social Sciences, Health and Social Health and Science teachers obtained high scores in student-oriented approaches, teachers of the Arts scored higher in knowledge-oriented approaches. They stated that the epistemologies of a particular academic background could promote different approaches to teaching online.

Finally, teachers' roles in online teaching could also influence the adoption of a particular

approach to said teaching (Baran, Correia and Thompson, 2011). Teachers' roles are commonly defined as functions and tasks involving teaching, usually well established by the educational institution, which indicate what teachers are allowed to do to carry out their educational activity. Significant contributions (Álvarez, Guasch & Espasa, 2009; Baran, Correia & Thompson, 2011; Guasch, Álvarez & Espasa, 2010; McShane, 2006; Mishra, 2005; Thach & Murphy, 1995; Williams, 2003) underline five types of teachers' roles in teaching online: 1) instructional design, which includes teaching activities related to educational planning, before the beginning of the course; 2) managing the learning activity, which refers to the organization of the learning tasks during the course; 3) learning assessment, which refers to how to monitor students' learning; 4) managing social interactions, which includes activities that promote appropriate social relationships between the teacher and the students, and among the students themselves; and 5) design and educational use of technology, which refers to teachers' actions to guide the appropriate use of technology, especially in terms of the virtual campus, and its adjustment to the specific needs of the virtual learning activity that is being developed.

To sum up, some studies have identified several approaches to teaching online (Gonzalez, 2009), and other studies have provided some insights about several factors that may influence teachers' adoption of a particular approach to teaching online (Baran, Correia, & Thompson, 2011). Nevertheless, more research is needed in this field that builds upon these efforts and considers all matters in a single framework in the special case of a fully online university.

Purpose and research questions

The aim of this paper is to provide a comprehensive overview of how teachers approach their online teaching, and which factors affect their adoption of a particular approach. To address these objectives, approaches to teaching online are outlined and individual teacher characteristics and roles related to teaching online are considered. The following research questions are explored:

RQ1. What are the teachers' roles in teaching online?
RQ2. What are the teachers' approaches to teaching online?
RQ3. What are the factors influencing the adoption of a particular approach to teaching online?

Method

Institutional context of study

This research project was carried out at the Open University of Catalonia[1], which is a fully online university. All courses conducted by this university are online. Undergraduate and graduate programmes are provided using a virtual campus, which is based on asynchronous written communication networks. It is important to emphasize that this research is focused on just one university. The educational model of the Open University of Catalonia puts the central focus on the student and the learning process. Educational resources and instructional strategies are aimed at promoting content access, student knowledge-building, and collaborative learning (Open University of Catalonia, n. d.).

[1] http://www.uoc.edu/

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The Open University of Catalonia (UOC) encompasses two kinds of teachers: The UOC's own teachers' staff, and a large number of part-time associate teachers. The first group of teachers, full-time workers, have responsibilities related to university management, curriculum development, instructional design, and research, among others. The associate teachers, as part-time workers, have a main job outside of the university, currently as a teacher in another university, or in a professional field.

The second group of teachers have responsibilities related to carrying out online teaching using a virtual classroom, which is a Learning Management System developed by the UOC itself (Open University of Catalonia, n. d.). The University expects associate teachers to develop their online teaching according to student-centred pedagogy (Knowlton, 2000), taking into account different teachers' roles in teaching: instructional design, managing the learning activity, managing social interaction, the design and educational use of technology, and learning assessment.

Data collection

Associate teachers of the Open University of Catalonia received an email from the research team inviting them to participate in the study and asking them to complete an online questionnaire, which could be accessed by a link embedded in the message itself. The online version of the questionnaire was answered anonymously between November 2011 and February 2012.

Participants

There were a total of 965 survey respondents, a response rate of 46.13% of all online associate teachers (a total of 2.092).

Measures

Participants' individual information

Participants were asked to provide basic individual information. Among the 965 teachers, 56% were men and 44% were women. Their average age at the end of 2012 was 43 (SD = 7.6). Regarding teachers' level of education, 24.3% had a bachelor's degree, 36% had a master's degree, and 39.7% a PhD, and they had an academic background in the following fields: Social Sciences (59.9%), Humanities (11.4%), Health Sciences (6.9%), Engineering (15.5%), and Sciences (6.2%). Most teachers taught at university at the undergraduate level (85.5%), while the rest taught at a graduate/PhD level (14.5%). Among the teachers surveyed, 33.5% had less than 3 years of experience in online teaching, 46.6% had from 3 to 10 years, and 19.9% had more than 10 years of experience. Finally, of the teachers surveyed, 24.5% dedicated less than 25% of their teaching time to online teaching, 21% dedicated from 26% to 50%, 22.5% dedicated from 51% to 99%, and 31.1% dedicated 100% of their time.

Teachers' roles in teaching online

Participants were asked to report on their perception of teachers' roles in teaching online using a Likert-type scale of twenty items (see Table 2), ranging from "not important" (1)

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to "very important" (5). The measurement was constructed by taking into account teachers' roles in teaching online, identified by relevant contribution (Álvarez, Guasch & Espasa, 2009; Baran, Correia & Thompson; 2011; Mishra, 2005; Thach and Murphy, 1995; Williams, 2003). Participants gave their valuation of the importance of several teaching tasks, those usually carried out as a teacher of the Open University of Catalonia, to teaching online.

Approaches to teaching online

Participants were asked to report on their perception of approaches to teaching online based on a Likert-type scale of twelve items ranging from "strongly disagree" (1) to "strongly agree" (5). The scale was constructed taking into account certain kinds of approaches initially identified by Jelfs, Richardson and Price (2009), González (2009), and Lameras, Levy, Paraskakis, and Webber (2012). The selected items reflected three kinds of approaches (see Table 3): the Collaborative Learning approach, the Content Acquisition approach, and the Knowledge Building approach. All three approaches were consistent with the aforementioned educational model of the Open University of Catalonia.

Data analysis

As a first step in the data analysis, two exploratory factor analyses on approaches to teaching online and on teachers' roles in online teaching were carried out, to reduce item variability to a multidimensional semantic space representing teachers' meanings. Three scales were formulated for approaches to teaching online, and five scales for teachers' roles to online teaching. In both cases, the raw scores were added and divided by the number of items included in each factor to retain the original scale (i.e. ranging from 1 to 5, to facilitate its interpretation).

In the second step, three multivariate regressions were developed to determine the relationship between the three approaches to teaching online and every independent variable. Regression coefficients (B), standard errors (S.E.), t-tests of significance, and their corresponding standardized versions (Beta) were also calculated. F-tests and R^2 values were used to determine the significance and the overall fit of the three multiple regressions and served as an indication of the explanation reflected in each model.

Results

RQ1. What are the teachers' roles in teaching online?

Principal component analysis showed an acceptable five-component structure (KMO=0.853 and a significant Bartlett test, p=0.000), explaining 62.07% of the total variance in the following teachers' roles: *Managing Social Interaction* (29.78%), *Instructional Design* (10.91%), *Guiding the Use of Technology* (9.22%), *Learning Assessment* (6.65%), and *Learning Support* (5.52%). The five components showed an acceptable reliability, with a Cronbach's α of 0.807, 0.743, 0.837, 0.720, and 0.763, respectively (see Table 2).

Teachers scored higher on the *Learning Assessment role* and *the Instructional Design role* scales than the other thee scales: The *Learning role, the Guiding the Use of*

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Technology role, and the *Managing Social Interaction role.*

[Table 2]

The *Managing Social Interaction* role refers to tasks such as promoting relations of trust and mutual commitment between students, and between students and the teacher, resolving group conflicts, and enhancing mutual communication among participants. In the *Instructional Design* role, teachers' tasks refer to content selection and adaptation, setting objectives and competency, instructional design and the preparation of learning activities and assessment. The *Guiding the Use of Technology* role includes tasks related to the design of the technological learning tools, integration of new tools in the virtual classroom, student orientation in the use of the virtual learning environment, and giving aids to promote the use of specific technological tools. The *Learning Assessment* role highlights the tasks the teacher has to carry out in regard to formative and summative assessment, such as answering students' questions about content, correcting mistakes in students' understanding, monitoring and evaluating individual or group learning activities, and communicating information to students regarding assessment (evaluation criteria, correct responses or qualifications). The *Learning Support* role corresponds to different teaching tasks, such as monitoring, guidance and evaluation of student participation in social interaction activities, orientation of individual study processes, control and monitoring of the learning pace, explanation of the methodology and the organization of study time, and the presentation and sequencing of learning activities.

RQ2. What are the teachers' approaches to teaching online?

Principal component analysis (PCA), displayed in Table 3, showed an acceptable three-component structure (KMO=0.834 and a significant Bartlett test, p=0.000), explaining 59.03% of the total variance. Three components were identified: *Content Acquisition* (33.98% of variance explained), *Collaborative Learning* (13.30% of variance explained), and *Knowledge Building* (11.75% of variance explained). The three components showed acceptable reliability, with a Cronbach's α of 0.762, 0.812, and 0.682, respectively (see Table 3).

Teachers scored higher on the *Knowledge Building approach* scale than the *Content Acquisition approach* scale, and both scales scored higher than the *Collaborative Learning approach* scale.

[Table 3]

With the *Collaborative Learning* approach, facilitating participation is the main aim of online teaching. Teachers who adopt this approach give priority to social activities and knowledge sharing. Teaching focuses on promoting learners' participation in collaborative learning activities, in order for students to share knowledge in virtual learning environments. In *Content Acquisition* approach, teaching focuses on the use of virtual learning environments to provide and acquire content. Most relevant to teachers is the use of technology as a medium for content delivery, to facilitate access to content, and to guide students in completing tasks. Finally, for *Knowledge Building* approach, teachers comment on the importance of ensuring that students are able, on their own, to complete successfully the activities outlined. So, teaching focuses on assuring the processes of knowledge construction: designing educational scaffoldings and learning supports,

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solving content doubts, and supervising the correct application of learning skills and adequate task resolution.

RQ3. What are the factors influencing the adoption of a particular approach to teaching online?

The influential factors are age, online teacher dedication, academic background, and teachers' roles. However, sampling variables such as gender, education, studies taught, and online teaching experience are not, in fact, associated with approaches to teaching online.

Table 4 shows the results of three multiple regression models of the approaches to teaching online. Taking into account the global adjustment of the three regression models, findings indicate that all three provide an acceptable degree of explanation (adjusted R^2=0.332, 0.415, and 0.332, respectively).

[Table 4]

On the one hand, the variables with the largest explanatory power of *Content acquisition approach* are *Guiding the Use of Technology* role, followed by *Learning Support* role, *Instructional Design* role, and *Learning Assessment* role. On the other hand, the variables with the largest explanatory power of *Collaborative Learning approach* are *Learning Support* role, and *Managing Social Interaction* role, followed by *Guiding the Use of Technology* role, and *Instructional Design* role. Finally, the variables with the largest explanatory power of *Knowledge Building approach* are *Learning Assessment* role and *Instructional Design* role.

Our results show other significant variables, albeit their effects are comparatively smaller. Age is also a factor in the adoption of any approach to teaching online. The older the online teachers, the more likely they are to adopt each approach to teaching online. Academic background and online teaching dedication are characteristics significantly associated with some approaches. Teaching Humanities makes one more likely to adopt the *Collaborative Learning* approach than teaching Social Sciences, and teaching Science makes one less likely to adopt both *Collaborative Learning* and *Knowledge Building* approaches than Social Sciences. Finally, one devoting 26% to 50% of their time to teaching online is more likely to adopt *Content Acquisition* approach than one dedicating less than 25% of their time, and to devote above of 51% of one's time makes one more likely to adopt *Collaborative Learning* approach than an online teacher dedicating less than 25% of their time.

Discussion and conclusion

The first research question explored teachers' roles in teaching online. Five teachers' roles were identified, and among them *Instructional Design* and *Learning Assessment* were the highest scored roles. The set of five teachers' roles in teaching online not only integrate different existing contributions (Álvarez, Guasch, & Espasa, 2009; Thach & Murphy, 1995), but also include a new role, named *Learning Support* role. Although it was poorly defined in previous research in this field, *Learning Support* appears to be a relevant role associated to teachers belonging to this university.

In addressing the second research question, findings revealed three primary approaches to teaching online: *Content Acquisition*, *Collaborative Learning*, and *Knowledge Building*. Previous researchers reported similar categories using qualitative methods (Gonzalez, 2009, 2010; Lameras, Levy, Paraskakis, & Webber, 2012). These three approaches should be regarded as different ways through which associate teachers facilitate students' learning in the fully online university studied in this research. Contrary to what could be expected in a completely online Higher Education institution, UOC's associate teachers do not conceive students' self-learning as an approach to teaching online.

Finally, in responding to the third research question, our results suggest that teachers concentrate on various different roles, and their focus is related to their approaches to teaching online. In this regard, the *Guiding the Use of Technology* role is the largest explanatory variable of the *Content Acquisition* approach; the *Learning Support* role and the *Managing Social Interaction* role are the best predictors of the *Collaborative Learning* approach; and the *Learning Assessment* role and the *Instructional Design* role are the main explanatory variables of the *Knowledge Building* approach. Additionally, other variables such as age, time devoted to teaching online, and academic background are related to approaches to teaching online, though their relationship is not as powerful as the contribution of the teaching roles.

All these findings taken together could be useful to encourage and facilitate further efforts by researchers and practitioners. This research may be replicated by other research teams in other educational scenarios, either in other fully online universities or in universities involved in blended instruction, to improve our knowledge of the relationship between teachers' roles and teachers' approaches. These new findings, likely to be characterized by the arising of new both approaches to teaching online and teachers' roles in teaching online, could be useful to establish new links between how these issues are decided at the institutional level, and how they are finally developed by teachers.

Our findings may also be considered by practitioners to help re-orientate the design of technology-based learning environments, support programs, and course planning in three specific directions. The development of the *Content Acquisition* approach may be actively promoted by improving teaching environments based on technology-centred approaches to learning (Mayer, 2010), such as computer-based training, multimedia, interactive simulation, or hypertext and hypermedia. In addition, teacher training and support programs aimed at developing and updating teachers' competencies on guiding individual students in the use of technology should be developed. Additionally, broadening in the design of more complex and powerful computer-supported collaborative environments could encourage the growth of the *Collaborative Learning* approach (Mayordomo & Onrubia, 2015). This initiative should be accompanied by training courses that promote teachers' competencies in these roles. Finally, the progress on the *Knowledge Building* approach could be promoted empowering the teachers in the implementation of instructional design and learning assessment roles. This process could be done by means of the design of complex open technology-based learning environments (Hannafin, Hill, Land, & Lee, 2014) that would provide students with opportunities to engage in problem-based learning. Training teachers in the performance of these two roles and supporting them when online courses are planned and developed would be also needed.

Despite these strengths, this study has several limitations. Given that previous studies on

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approaches to teaching online are scarce, it is neither possible to build a more solid theoretical background, nor to back up our findings with more studies that have focused on this research topic. This lack of research caused initial problems when developing some parts of the questionnaire. Until recently, only Gonzalez (2013) had developed and tested a first questionnaire to collect information about university teachers' teaching experiences in online university courses. Another limitation is that this study cannot be used to generalize results because participants came from just one fully online university. This fact may have caused a more narrow range of potential findings, especially in the identification of online teachers' roles and teaching approaches. For instance, although the literature reviewed (Gonzalez, 2009) identified the online teaching approach of "the Web is used for individual access to learning materials and information and for individual assessment", this approach to teaching online did not appear in our findings using the principal component factorial analysis.

Note about open data, ethics and conflicts of interest

This research paper has been developed in accordance with the ethical standards of the American Psychological Association (2010). Participants were informed in advance of the general aim of the research, its duration and the procedure to collect, store, and analyse the information provided by them. Following this notification, participants freely decided to answer the online survey. Data collected has been stored and managed observing the law on data protection and the right to confidentiality. Access to the database will be provided by the first author on the request of the interested party. Solicitations should contain information about the aim of the research and the type of analysis that researchers want to do. Applicants will be given a well-reasoned reply.

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Tables

Table 1. Authors' contributions to defining kinds of approaches to teaching online

	Managing learning task	**Promoting self-learning**	**Facilitating content acquisition**	**Supporting knowledge-building**	**Supporting collaborative learning**	**Creating community and networked learning**
Roberts (2003)		Promote individual self-paced learning	Promote the use of the Web as a source of information		Promote group analysis, decision making and dialogue	
Ellis, Steed and Applebee (2006)	Manage study activity, completing the learning task	Encourage students' autonomy in learning	Encourage students to learn content using new technologies	Support students' learning and understanding of content		
Gonzalez (2009, 2010)			Promote individual access to learning content	Support knowledge-building tasks	Provide content and facilitate educational interaction among students	Share information among students and guide the process of students' knowledge acquisition
Jelfs, Richardson and Price (2009)	Task-oriented approach		Knowledge-oriented approach	Student-oriented approach		
Lameras, Levy, Paraskakis and Webber (2012)			Transferring information to students	Promoting clarification of content and proposing different ways of thinking	Supporting exploration of content resources and educational interaction among students	Supporting collaborative knowledge creation among the online community

Table 2. Rotated component matrix (factor loadings) and descriptive statistics for teachers' roles in teaching online (N = 965)

	Mean	SD	F1	F2	F3	F4	F5
Managing Social Interaction	**3.52**	**0.78**					
Promotion of relationships of trust and mutual commitment among students.	3.58	0.99	**0.864**	0.136	0.276	0.166	0.390
Resolution of group conflicts among students.	3.37	1.03	**0.781**	0.265	0.369	0.250	0.346
Enhancement of cordial and warm relations between teacher and students.	4.03	0.88	**0.731**	0.173	0.188	0.376	0.319
Facilitation of personal or professional knowledge among students.	3.11	1.01	**0.726**	0.125	0.487	0.085	0.377
Instructional Design	**4.34**	**0.54**					
Design of the training proposal based on the training requirements.	4.24	0.77	0.058	**0.768**	0.212	0.184	0.179
Selection, design and/or content adaptation.	4.35	0.69	0.125	**0.759**	0.181	0.191	0.053
Establishment of learning objectives and competency to be developed.	4.33	0.70	0.145	**0.739**	0.255	0.224	0.245
Selection, design and/or adaptation of learning activities and assessment.	4.43	0.65	0.224	**0.726**	0.123	0.355	0.150
Guiding the Use of Technology	**3.60**	**0.76**					
Design of certain technological tools for learning.	3.56	0.90	0.313	0.255	**0.827**	0.079	0.201
Decision to integrate new technological tools into the existing virtual environment.	3.58	0.91	0.238	0.186	**0.817**	0.113	0.227
Guidance of students in the use of the virtual learning environment.	3.72	0.93	0.264	0.248	**0.808**	0.231	0.281

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Regulation of an appropriate use of technology by students.	3.55	0.98	0.315	0.199	**0.795**	0.202	0.337
Learning Assessment	**4.44**	**0.50**					
Correction of students' misunderstanding of content.	4.33	0.72	0.133	0.209	0.173	**0.781**	0.203
Resolution of questions from students about the content.	3.16	0.54	0.178	0.175	0.110	**0.775**	0.147
Monitoring and evaluation of students' individual and group activities.	4.38	0.70	0.281	0.377	0.149	**0.677**	0.389
Providing students with information about assessment (grades, correct answers and/or evaluation criteria).	4.37	0.72	0.316	0.375	0.222	**0.644**	0.262
Learning Support	**3.66**	**0.70**					
Guidance and monitoring of students' participation in social interaction activities.	4.38	0.70	0.470	0.171	0.213	0.085	**0.820**
Monitoring and evaluation of students' participation in social interaction activities.	3.41	0.98	0.577	0.158	0.245	0.154	**0.755**
Guidance and regulation of students' individual study processes.	3.62	0.87	0.262	0.114	0.400	0.268	**0.746**
Control and monitoring of students' learning pace and learning periods.	3.99	0.81	0.199	0.303	0.230	0.407	**0.679**

Table 3. Rotated component matrix (factor loadings) and descriptive statistics for approaches to teaching online (N = 965)

	M	SD	F1	F2	F3
Collaborative Learning	**3.65**	**0.64**			
It's clear that in a virtual context, learning should be an activity mainly for social participation in virtual groups, interacting with peers and building shared knowledge.	3.59	1.01	**0.827**	0.054	0.071
In order to assess knowledge acquired, I analyse the extent to which students have made appropriate use of new knowledge in social activities (e.g. virtual debates).	3.46	1.07	**0.776**	0.117	0.113
I encourage my students to share their knowledge with other colleagues in virtual spaces of communication if they want to learn in a virtual context.	3.64	0.96	**0.764**	0.161	0.104
I think we should make recommendations to students on how they can improve the way they participate in virtual communication activities with their colleagues.	3.59	0.93	**0.739**	0.261	0.130
Content Acquisition	**3.67**	**0.70**			
To develop properly my virtual teaching, I need to have technological environments that can guide students in how to carry out correctly their learning tasks.	3.73	0.89	0.225	**0.756**	0.214
To develop properly my virtual teaching, I need to have multimedia technology environments with interrelated digital content that help students to access content in a quick, easy and safe way (e.g. a website).	3.81	0.99	0.187	**0.745**	0.150
To develop an online course, I need to use the correct technology to transmit content information to students.	3.19	0.94	0.114	**0.728**	-0.005
To develop an online course, I need to use the correct technology to track students' individual study processes.	3.96	0.85	0.050	**0.723**	0.127
Knowledge Building	**4.30**	**0.53**			
As a virtual teacher, I have to ensure that students are learning the content correctly, so I have to resolve all doubts that may arise, within an optimal response time.	4.53	0.68	-0.005	0.088	**0.781**
As a virtual teacher, I have to ensure that students are properly applying their learning skills to complete the activities they are given.	4.14	0.78	0.219	0.165	**0.710**
In order to assess knowledge acquired by students, I appreciate how well students have completed the learning activities given.	4.32	0.70	0.032	0.011	**0.687**
As a virtual teacher, I think carefully about how to specify in detail the learning activities and educational scaffoldings that students may require.	4.23	0.78	0.263	0.287	**0.569**

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Table 4. Multiple regression models of approaches to teaching online (N = 965)

	Content Acquisition				Collaborative Learning				Knowledge Building			
	B	S.E.	Beta	t	*B*	S.E.	Beta	t	*B*	S.E.	Beta	t
Intercept	0.105	0.238	-	0.443	0.871	0.203		4.284 [c]	1.173	0.177		6.624 [c]
Gender												
Female	-	-	-	-	-	-	-	-	-	-	-	-
Male	0.047	0.040	0.033	1.174	-0.010	0.034	-0.007	-0.282	-0.062	0.030	-0.059	-2.095
Age	0.006	0.003	0.066	2.266[a]	0.006	0.002	0.068	2.496[a]	0.006	0.002	0.091	3.099[b]
Education												
Bachelor's degree	-	-	-	-	-	-	-	-	-	-	-	-
Master's degree	0.025	0.051	0.017	0.484	0.039	0.044	0.029	0.894	0.051	.038	0.047	1.338
PhD	-0.025	0.057	-0.017	-0.435	-0.075	0.049	-0.057	-1.541	-0.021	0.042	-0.020	-0.498
Academic background												
Social Sciences	-	-	-	-	-	-	-	-	-	-	-	-
Health Sciences	-0.074	0.076	-0.027	-0.985	0.032	0.065	0.013	0.496	-0.099	0.056	-0.048	-1.760
Engineering	0.062	0.056	0.032	1.097	-0.075	0.048	-0.042	-1.564	-0.074	0.042	-0.051	-1.752
Sciences	-0.041	0.079	-0.014	-0.520	-0.197	0.068	-0.074	-2.914[b]	-0.132	0.059	-0.061	-2.247[a]
Humanities	.0066	0.061	0.030	1.082	0.107	0.052	0.053	2.050[a]	-0.073	0.045	-0.044	-1.602
Online teaching experience												
Less than 3 years	-	-	-	-	-	-	-	-	-	-	-	-
From 3 to 10 years	-0.062	0.044	-0.044	-1.411	-0.059	0.038	-0.046	-1.559	-0.042	0.033	-0.040	-1.289
More than 10 years	0.032	0.059	0.018	0.537	-0.059	0.051	-0.037	-1.159	-0.029	0.044	-0.022	-0.654
Studies taught												
Undergraduate	-	-	-	-	-	-	-	-	-	-	-	-
Graduate/PhD	-0.060	0.055	-0.030	-1.099	-0.011	0.047	-0.006	-0.235	-0.041	0.041	-0.027	-1.015
Online teaching dedication												
Less than 25%	-	-	-	-	-	-	-	-	-	-	-	-
From 26% to 50%	0.121	0.056	0.070	2.174[a]	0.065	0.048	0.042	1.369	-0.019	0.042	-0.015	-0.449
From 51% to 99%	0.065	0.058	0.039	1.129	0.096	0.049	0.062	1.941[a]	-0.017	0.043	-0.013	-0.384
100%	0.069	0.058	0.045	1.189	0.102	0.050	0.074	2.064[a]	0.015	0.043	0.013	0.350
Teachers' roles												
Managing Social Interaction	0.009	0.031	0.010	0.285	0.243	0.027	0.293	9.151[c]	0.049	0.023	0.073	2.137[a]
Instructional Design	0.164	0.039	0.127	4.264[c]	0.111	0.033	0.094	3.380[b]	0.200	0.029	0.207	6.963[c]
Guiding the Use of Technology	0.358	0.029	0.388	12.557[c]	0.085	0.024	0.101	3.485[b]	0.048	0.021	0.070	2.276[a]
Learning Assessment	0.143	0.044	0.101	3.262[b]	-0.024	0.037	-0.019	-0.652	0.369	0.033	0.351	11.327[c]
Learning Support	0.157	0.034	0.157	4.668[c]	0.273	0.029	0.298	9.489[c]	0.031	0.025	0.041	1.218
Model summary												
R^2 (Adjusted R^2)	0.345 (0.332)				0.426 (0.415)				0.345 (0.332)			
F for the model	26.055 [c]				36.786 [c]				26.049 [c]			
Sample size	960				960				960			

[a] $p<0.05$. [b] $p<0.01$. [c] $p<0.001$

Practitioner Notes

Approaches to teaching online: Exploring factors influencing teachers in a fully online university

What is already known about this topic

- Until today, the study on approaches to teaching online has been carried out mainly by means of qualitative methods.
- Six different kinds of teachers' approaches to online and blended environments have been identified: managing learning tasks, promoting self-learning, facilitating content acquisition, supporting knowledge-building, supporting collaborative learning, and creating community and networked learning.
- Several research projects suggested that some contextual and individual factors, such as teachers' roles in teaching online, influence teachers' approaches.

What this paper adds

- Teachers teach in a fully online university using three primary approaches to teaching: content acquisition approach, collaborative learning approach, and knowledge-building approach.
- The most common and well-defined teachers' roles in a fully online university are: management of social interaction, instructional design, guiding the use of technology, learning assessment, and learning support.
- The perceived importance of each role in teaching online is the higher predictor of the adoption of each different approach.
- Age, academic background, and online teaching dedication also influence the adoption of each approach to teaching online.

Implications for practice and/or policy

- Online teachers could take advantage of both scales of approaches and teachers' roles in teaching online to make accurate self-assessments.
- Instructional designers of virtual learning environments could go further in their instructional models if they take into consideration the five main teachers' roles to teach online in fully online universities.
- Teachers' training could improve the competencies of online teachers if they take into account the close relationship between how online teachers perceive their roles in teaching online and how they approach their teaching online.

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