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Design and Pedagogy Features in Online Courses: A survey

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Abstract

Purpose: *The study investigates the preferences of instructors and students for design and pedagogy features of online instruction at the post-graduate level.*

Design/Methodology/Approach: *The study was carried out using questionnaire as a data gathering tool. Characteristics and features were identified through a comprehensive literature review combined with focus groups. Various design and pedagogy features were identified and the items were structured in a Likert Scale format. Respondents were asked to rate their preferences on a five-point scale, ranging from strongly agree to strongly disagree, for each individual feature. Participants include 7 instructors and 50 students at Indira Gandhi National Open University (IGNOU).An independent sample T-test was conducted to determine if there was a significant difference between the preferences of instructors and students on the rating of individual features.*

Scope: *To better understand the design and pedagogy features of online instruction, India's largest e-learning academic institution IGNOU was selected.*

Findings: *Major findings include the high level of agreement on design and pedagogy features by instructors and students and the similarities in rank order by both students earning regular university credit and those pursuing professional development goals. When compared with the ranking of instructors and students, low preferences were being placed on social interactive features.*

Practical Implications: *While there are many parallels between face-to-face teaching and online instruction, there are some differences also. Asynchronous online instruction must be designed in advance of being delivered.*

Keywords: *Pedagogy; e-learning; Continuing education; Online instruction; Development expertise*

Paper Type: *Research*

Introduction

e-learning has not only experienced significant growth, but it has also gone through a transformation in recent years. Correspondence courses and other forms of independent study programs have largely given way to options delivered via technology. This

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has been partly due to the emergence of the Internet and technologies that enhance and improve the development and delivery of online instruction. It has also been due to the need for greater access to education as well as the economics of not having to require students to be physically present in a particular setting in order to benefit from instruction **(Hu, 2011)**. Institutions of higher education, from community colleges through graduate schools, now offer online courses and degrees. Departments of progressing and continuing education in universities were quick to respond to the instructional opportunities offered by the Internet. The distance education mission of continuing education has been greatly enhanced by creative uses of the Internet **(Allen & Seaman, 2008)**. Online instruction as a vehicle for distance education offers the advantage of easy access. Students can complete online courses wherever connectivity is available. They are able to work on courses 24/7 and at times that are most convenient to them. Today departments of continuing education are major providers of online courses for professional development and degree-seeking students.

The use of technology has become systematic to instruction in higher education regardless of the provider and the structure of the course design. The early focus on online instruction emphasized asynchronous instruction to maximize flexibility for students and to take full advantage of the features offered by the Internet **(Ku & Lohr, 2003)**. As online courses became more popular on traditional campuses, synchronous courses gained in popularity. Today, hybrid courses that combine face-to-face instruction with web-based features are common on most campuses. Technology makes online instruction possible. However, it is the design and pedagogy of online instruction combined with content that represents the significance of this new form of teaching and learning.

Literature Review

A sizable literature describes features for design and pedagogy in online courses and its successful implementation to facilitate traditional learning with a new, improved and electronic ways of delivering instructions. The greatest asset to e-learning is its ability to allow the student to control the learning process by offering him/her an immediate, action oriented, and practical learning experience **(Kamsin, 2005)**. The most important for the learning process is the flexibility and it can be best seen in e-learning. Furthermore, e-learning aims at replacing old-fashioned time/place/content predetermined learning with a just-in-time/artwork-place/customized/on-demand process of learning **(Alsultanny, 2006)**.

e-learning attempts to automate education, replace a paid instructor, and develop self-paced learning, but for this purpose, an efficient management support and IT platform is needed. One way of supporting

and improving education may be found within the transformation of teaching and learning commonly referred to as flexible learning, i.e. developing courses with the help of flexible learning methods and with the support of ICT **(Karlsudd & Tagerud, 2008)**. Thus e-learning is better seen as the only viable solution for mass education. Used wisely and well, it may break down barriers to learning that traditional classroom-based instruction has unintentionally created. Face-to-face, real-time interactions offer immediacy, personal contact, and community—all highly regarded features of a positive learning environment—instructors creating courses for online delivery have commonly considered the absence of face-to-face interaction a loss and have struggled to compensate for that loss **(Kuriloff, 2005)**.

Perhaps even more important than cost savings are the flexibility, adaptability, and responsiveness of the e-learning approach in a world where learning faster and better may be the only sustainable competitive advantage **(Longmire, Tuso & Wagner, 2000)**. As the Internet has expanded and e-commerce has mushroomed, the possibilities for e-learning delivery have become increasingly attractive.

Problem

The study investigates the preferences of instructors and students for design and pedagogy features of online instruction at the post-graduate level.

Methodology

The study was carried out using questionnaire as a data gathering tool. Characteristics and features were identified through a comprehensive literature review combined with focus groups. A 63 item survey instrument comprising of statements describing design and pedagogy features were developed and administered to 50 students enrolled in at least one online continuing education course and 7 instructors of online courses at the same institution. The instrument was structured on a 5-point Likert scale. The responses were coded as follows: 5 = *Strongly Agree*, 4 = *Agree*, 3 = *neutral*, 2 = *Disagree*, 1 = *Strongly Disagree*. The instrument was created using Kwik Survey. An independent sample T-test was conducted to determine if there was a significant difference between the preferences of instructors and students on the rating of individual features.

Scope

To better understand the design and pedagogy features of online instruction, India's largest e-learning academic institution IGNOU was selected.

Construct, design and pedagogy (teaching) features

The creation of effective asynchronous online courses makes maximum use of the instructional features offered by the Internet. They are typically self-paced courses making it very difficult to make revisions once the course is in progress and students are enrolled. In contrast to face to face instruction that allows considerable flexibility during the process of teaching, asynchronous online courses must be developed prior to implementation. The development and delivery of online courses require a wide range of expertise and an infrastructure that is not required for other forms on instructional delivery.

- **Range of required development expertise**

Determining content knowledge and desired learning outcomes are clearly the responsibility of instructors. However, a broader set of expertise is required to develop and implement an asynchronous online course. The cycle of developing online courses in higher education typically involves the instructor having conceptualized and organized the content before the formal development process begins **(Lim, 2004)**. These are critical steps and they combine with decisions on instructional design and pedagogy/teaching to provide a frame work for other areas of needed expertise. The preferences of students and instructors for specific instructional design and teaching/pedagogy features are central to the focus of this study.

- The approach to online course development in higher education employs a team model. A team member may possess expertise in more than one area. This is particularly true of instructional designers. Higher education institutions have developed support teams in some form to assist faculty members in the development and delivery of online courses. How institutions of higher education structure the services and what they expect faculty to do will vary **(Mortera-Gutierrez, 2006)**. Instructional design refers to the technical features created within a course to enhance learning, access to content and the implementation of instructional strategies for use by instructors.
- Teaching/pedagogy refers to the methodology that instructors employ when teaching online. While there are elements common to most online courses, instructors do vary in their teaching style just as they vary in face to face instruction.
- Content/knowledge refers to the information, skills and/or concepts that combine to represent what students are intended to learn from the course.
- Content management refers to the processes that are carried out by course developers in ensuring that the format of the content meets

the technical requirements of the instructional design and the Internet delivery requirements.

- Programming refers to customized programming required to deliver the instruction as intended and/or the use of a Learning Management System such as Blackboard or Moodle.
- Technical support refers to the consultation and/or tools essential to enhancing the distribution of online courses, navigation through a course and maximizing stability of all features.
- Student support refers to those services that approximate the services received by students in face to face courses e.g., ease of enrolment, library resources, advisement and access to instructors.
- Learner outcomes refer to the determination of the skills, knowledge and/or behaviour that learners should achieve as a result of successfully completing the course.
- Formative evaluation refers to strategies for eliciting information related to learning, features, content and features that facilitate revision of courses to improve quality of instruction and learner outcomes.
- Course development refers to the structuring of features, content, supports and delivery system to prepare the course for delivery as intended.

➢ **Student perspectives of online courses**

Online courses often can be less motivational than traditional classes. They also tend to have higher dropout rates and on average yield lower grades than regular students get. However, this is changing. Some professors and schools are redesigning their courses to take advantage of the Web's interactive and visual possibilities, adopting some bleeding-edge technologies such as game like simulations and digital avatars to make online courses more exciting and more effective than traditional classrooms **(Neuhauser, 2002)**. Many students even say that a good e-learning course inspires them to work harder. Some of the offered advices to students on what to look for in an e-learning program are:

- Do your own research to make sure the online program or course is accredited by an approved organization. Also find out if the course will be accepted if you want to transfer.
- Find out whether the courses are "synchronous" or "asynchronous". Researchers say one of the biggest reasons students fail at online courses is that they aren't honest with themselves about how much time they can actually devote each week to an online course and whether they have the discipline to work without traditional course structures.

- Have good computer skills and access to well-equipped computers with high speed Internet connections.
- Check out the course design and be certain that they start out with a well organized and detailed syllabus and clear, logical grading criteria.
- Remember that the best online teachers provide information in many different ways.
- Isolation is one of the most common reasons given by online students who drop out or fail. So, community-building should be part of the art of teaching.
- Are the instructors known for quick and thorough responses? The best online teachers are easily accessible, if not by phone, then by e-mail, instant message, or some other method.

➢ **Designing an online instruction**

Online courses have not been exempted from evaluation by students. Not only is it feasible to evaluate the quality of content and the technology employed in delivering online courses, but all aspects of courses including the responses of students and instructors to each other can be examined. The latter have not been in practice, but the capacity for such review illustrates the potential sources of evaluation from the perspective of students. The options available for student evaluation of instruction are at least as comprehensive as for face-to-face instruction. Early in the development of online instruction many institutions of higher education charged higher tuition fees for enrolling in online courses. The assumption was that they were more expensive to create and deliver. This occurred despite escalating tuition costs. Students are sensitive to costs and to the quality of instruction they receive for their investment.

International students, however, have additional challenges in each of these areas because of cross-cultural differences in values, language barriers, and learning format preferences.

Thus, course design should take this into account in several ways:

- Attempting to increase the self-confidence and motivation of students early in the course through progressive scaffolding of needed skills.
- Providing the opportunity to work in small group for the experience of giving and receiving feedback.
- Maintaining a self-paced and self-directed design of the learning environment.
- Providing multiple opportunities for reading and writing.
- Encouraging face-to-face interactions or meeting with group members and instructors when possible.

Findings

Students' Online Course Experience

Of the 50 student participants who respond to the online course experience question, 38 (76%) have taken an online course for the first time, 12 (24%) have taken their second online course and none has taken three or more online courses. A total of 72 % of the participating students had experience in taking online courses beyond the course that they are completing at the time of the study. Students' online course experience data are shown in **Table 1**.

Table 1: Students' Online Course Experiences

No. of Courses	Frequency
No prior course	38 (76)
One prior course	12 (24)
Total	**50**

Figures in parentheses indicate percentage

Students' Internet Experience

The Internet experience of the students is extensive with 2% reporting nine or more years of experience, 16% report six or more years of experience, 54% respond four to six years of experience and 28% are having less experience (1-3 years) in using internet.

Table 2: Students' Internet Experience

Years	Frequency
1-3 years	14 (28)
4-6 years	27 (54)
6-9 years	8 (16)
More than 9 years	1 (2)
Total	**50**

Figures in parentheses indicate percentage

Instructor participants

Of the 7 instructor participants, all of them answered the age question. It is evident that in the age range of 18-25 no instructor was found. 2 (28.57%) instructors in the age range of 26-35 were found followed by 3 (42.85%; 36-45); 1 (14.28%; 46-55); 1 (14.28%; 56-65). The instructor age distribution is reported in **Table 3**.

Table 3: Instructor Age Distribution

Age	Frequency
18-25	0 (0)
26-35	2 (28.57)
36-45	3 (42.85)
46-55	1 (14.28)
56-65	1 (14.28)
Total	**7**

Figures in parentheses indicate percentage

Instructors' Internet Experience

Of 7 respondents, 3 (42.85%) have more than 9 years internet experience, 2 (28.57%) have 7-9 years experience, 1 (14.28%) has 4-6 years experience and 1 (14.28%) has 1-3 years experience **(Table 4)**.

Table 4: Instructors' internet experience

Years	Frequency
1-3 years	1 (14.28)
4-6 years	1 (14.28)
7-9 years	2 (28.57)
More than 9 years	3 (42.85)
Total	**7**

Figures in parentheses indicate percentage

Instructors online course experience

Of the 7 online course instructors, 2 (28.57%) teach their first online courses, 4 (57.14%) teach their second online course, 1 (14.28%) teaches third online courses, and none have taught more than three online courses **(Table 5)**.

Table 5: Instructors online course experience

No. of Courses Taught	Frequency
No prior course	2 (28.57)
One prior course	4 (57.14)
Two prior courses	1 (14.28)
Three or more prior courses	0 (0)
Total	**7**

Figures in parentheses indicate percentage

- **Instructor and Student Preferences for Online Course Features**

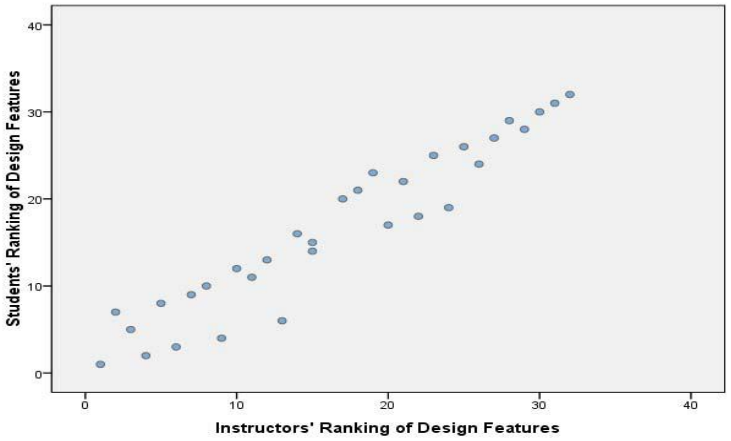
Each of the items on the survey instrument describes either a design feature or a pedagogy feature of online courses. The intent was to determine the level of agreement or disagreement between 7 instructors

and 50 student groups in their preferences for the features as defined and grouped on the survey instrument.

- **Descriptive Data on Responses to Survey**

Graph-1 (Scatter Plot) represents the number of responses by each group to the 63 individual items on the survey instrument along with the mean, Std. deviation and values about design features.

Graph-1: Correlation between instructors' ranking and students' ranking of design features



(a) Design Features

Table 6: 10 most preferred design items as ranked by Instructors and Students

Rank	Instructors Preferred Items	Students Preferred Items
1	Be reliable and free from technical problems	Be reliable and free from technical problems
2	Allow students to easily access required instructional resources.	Allow students to easily navigate from the start to the end of an assigned task
3	Include sufficient and easily understood menus	Be efficiently accessible anytime and anyplace where connectivity is available.
4	Allow students to easily navigate from the start to the end of an assigned task.	Allow students to easily access grades on assignments and keep track of communication records
5	Provide easy to follow navigation options.	Include sufficient and easily understood menus
6	Be efficiently accessible anytime and anyplace where connectivity is available	Allow easily access to any part of the course
7	Allow instructor to tailor responses to individual student work	Allow students to easily access required instructional resources

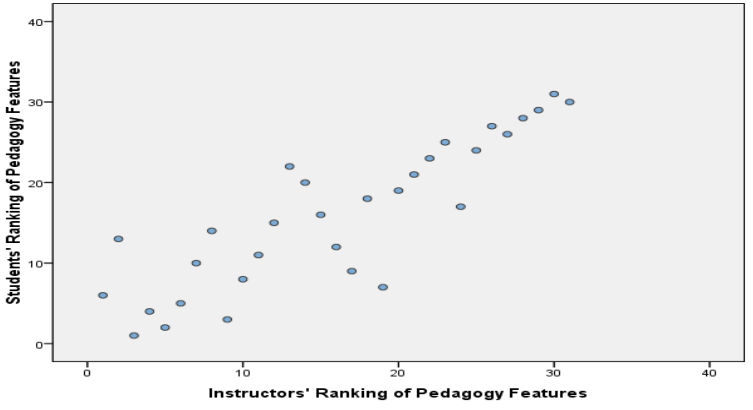
Rank	Instructors Preferred Items	Students Preferred Items
8	Allow students to easily navigate from the start to the end of an assigned task.	Provide easy to follow navigation options
9	Allow students to easily access grades on assignments.	Allow instructor to tailor responses to individual student work.
10	Provide tools for instructors to easily track student work and grades.	Provide clear explanations for how students access institutional support services.

While the list of items included in the top ten **(Table 6)** by both groups is similar, they varied in the order in which they are ranked. The only items not included in the top ten by both groups are 'align assessments with course objectives and allow students to demonstrate what they are learning though varied activities'. The item *"provide tools for instructors to easily track student work and grades,"* is included by instructors but not students and the item *"allow students easy access to any part of the course,"* is not included in the instructors' top ten list, while it is included by the students as a preference.

(b) Pedagogy items

A correlation analysis on the pedagogy item rankings between instructors and students is conducted resulting in a correction coefficient of 0.868 **(Graph-2**).

Graph-2: Correlation between instructors' ranking and students' ranking of pedagogy features



The 10 most preferred pedagogy items as ranked by instructors and students

Table 7: Rankings Instructors Overall students

Rank	Instructors Preferred Items	Students Preferred Items
1	Allow students to understand course goals and objectives.	Provide a detailed syllabus.
2	Stimulate critical thinking.	Ensure that all web addresses (URLs) are accurate and active.
3	Provide a detailed syllabus.	Present clear and understandable performance expectations
4	Provide students with an understanding of the grading system	Provide students with an understanding of the grading system
5	Ensure that all web addresses (URLs) are accurate and active.	Inform students on how to communicate with the instructor.
6	Inform students on how to Communicate with the instructor (in audio/video lectures).	Allow students to understand communicate Course goals and objectives.
7	Engage students in assignments course objectives	Provide study guideline for exam related to preparation
8	Provide an explicit orientation to the course structure and requirements.	Align assessments with course objectives and self correct quizzes
9	Present clear and understandable performance expectations.	Allow all students to work independently at their own pace

T-test result

In order to compare the student's and instructor's preferences about design and pedagogy features of online courses, t-test was employed to the data. The test assesses whether the means of two groups are statistically different from each other or not. The study mainly focuses on the three values:

(a) T-value: The t-value is mainly calculated by thumb rule, whereby t-value calculated to be greater than 2 is significantly higher than the value less than 2. We call it positively or negatively significant to the assumed value at 0.05% of significance.

(b) M-value: M is the mean of the preferences as calculated from the data of students and instructors independently.

(c) P-value: The p-value is the alpha level set for the analysis. If the value comes <0.05, then the difference is significant, otherwise the difference >0.05 between the two variables is not significant.

Design Items

1. Students rate keeping student communication record feature (M=3.42, SD=1.0) significantly higher than instructors (M=2.91, SD=.83), t (218) =2.79, p=.006.
2. Students rate multiple options for communication feature (M=4.19, SD=.76) significantly higher than instructors (M=3.82, SD=.90), t (216) =2.52, p=.012.

3. Students rate synchronous online chat feature (M=3.29, SD=1.03) significantly higher than instructors (M=2.85, SD=.89), t (216) =2.34, p=.02.
4. Students rate video lecture feature (M=3.53, SD=1.05) significantly higher than instructors (M=3.12, SD=.95), t (216) =2.15, p=.033.
5. Students rate self correct quizzes feature (M=4.18, SD=.85) significantly higher than instructors (M=3.74, SD=1.02), t (216) =2.70, p=.007.

Pedagogy items

6. Students rate independent, self-paced feature (M=4.48, SD=.78) significantly higher than instructors (M=4.14, SD=.91), t (233) =2.27, p=.024.
7. Students rate detail syllabus feature (M=4.67, SD=.65) significantly lower than instructors (M=4.91, SD=.28), t (233) =-2.18, p=.030.
8. Students rate explicit orientation feature (M=4.39, SD=.91) significantly lower than instructors (M=4.77, SD=.43), t (233) =-2.73, p=.007.
9. Students rate access additional enrichment feature (M=3.88, SD=.81) significantly lower than instructors (M=4.29, SD=.89), t (233) = - 2.44, p=.016.
10. Students rate varied activities to demonstrate what they learned feature (M=3.80, SD=.91) significantly lower than instructors (M=4.31, SD=.72), t (257) =-3.21, p=.002.
11. Students rate understand course goals and objectives feature (M=4.55, SD=.64) significantly lower than instructors (M=4.94, SD=.24), t (233) =-3.58, p=.000.
12. Students rate how to communicate with the instructor feature (M=4.62, SD=.57) lower than instructors (M=4.82, SD=.39), t (218) =-2.02, p=.05.
13. Students rate understanding the grade system feature (M=4.62, SD=.62) significantly lower than instructors (M=4.88, SD=.33), t (218) = - 2.44, p=.016.
14. Students rate engagement in course related assignments feature (M=4.44, SD=.69) significantly lower than instructors (M=4.79, SD=.41), t (216) =-2.89, p=.004.
15. Students rate stimulate critical thinking feature (M=4.39, SD=.76) significantly lower than instructors (M=4.94, SD=.24), t (216) =-4.43, p=.000.
16. Students rate align assessment with course feature (M=4.49, SD=.60) significantly lower than instructors (M=4.74, SD=.75), t (216) = - 2.11, p=.036.

17. Students rate study guide for exam feature (M=4.52, SD=.73) significantly higher than instructors (M=4.06, SD=1.01), t (216) =3.14, p=.002.
18. Students rate sharing information about themselves feature (M=3.48, SD=.98) significantly lower than instructors (M=3.91, SD=.75), t (216) =-2.11, p=.017.

Conclusion

With the emergence of the Internet technology, a new instructional delivery system has evolved that not only increases accessibility to higher education, but offers opportunities to tailor distance education to the needs of students. While there are many parallels between face-to-face teaching and online instruction, there are some differences. Asynchronous online instruction must be designed in advance of being delivered. The instructor does not have the opportunity to conveniently make content or format changes during the process of teaching as they are able to do in face-to-face teaching. During the development stages of creating online course, decisions must be made on the utilization of features that are made available by technology. Decisions on the use of features in online teaching are largely the responsibility of instructors in the larger context of institutional policy.

The most preferred pedagogy features by both the groups are as below:

- Allow students to understand course goals and objectives.
- Provide a detailed syllabus.
- Provide students with an understanding of the grading system.
- Ensure that all web addresses (URLs) are accurate and active.
- Inform students on how to communicate with the instructor.
- Engage students in assignments related to course objectives.
- Present clear and understandable performance expectations.
- Align assessments with course objectives.

Given the newness of online instruction, there is a wide array of inquiry that needs to be pursued to build a strong research base specific to online instruction in higher education. Just as research should drive instruction in face-to-face teaching, the same should apply to online instruction.

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