

COMMUNICATION

Competencies for Web-based Instructional Designers

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Abstract : *Instructional Design and the role of instructional designer in designing instruction is not a recent concept. Design of instruction involves a set of clearly defined skills. The objective of this survey was to find out the competencies needed for instructional designers to prepare web based instruction. The questionnaire was posted at <http://websurveyor.net/wsb/dll/3623/cwid.htm> for access by all to respond. The survey was available for response for a period of 20 days. Findings of the survey reveal that majority of the respondents were females, belonged to the age group 35-44 years, were instructional designers working in different Universities and involved in developing web based courses. Responses also indicate that designers need some prerequisite skills to design web based courses.*

Introduction

The purpose of instruction in both the conventional system and open and distance education system is to help students learn. It comprises a set of activities that facilitates the learners. These activities can be in the form of printed learning material, listening to a teacher talk, viewing a programme on television or video, observing a phenomenon etc. For optimizing learning, instruction has to be designed in a systemic way. This systemic procedure to ensure learning is the basic spirit of Instructional Design.

Briggs (1977), describes instructional design as '*the entire process of analysis of learning needs and goals and the development of a delivery system to meet the needs.*' He also indicates that design includes the '*development and try out and revision of all instruction and learner assessment activities*'.

The point highlighted in this definition of instructional design is that design involves a whole range of activities. These include like writing instructional materials or computer assisted instruction or evaluation etc. It means that instructional design relates to the design of not only instructional materials but of the entire programme. Therefore, if

learning has to take place, the design has to be appropriate. For this, Instructional designers should be involved in the process of designing programmes where their role will be to provide advice on how the teaching should occur. Johnson and Foa (1989) states, *'Instructional Designers are people who know how to generate, evaluate and communicate information. They have good questioning, listening, speaking and writing skills. They are curious about the content of each instructional situation and personally care whether or not the learner successfully acquires the necessary knowledge or skill'*.

Before we elaborate on the competencies for web based instructional designers which is the burden of this article, let us understand briefly the latest instruction delivery mechanism — The Web-based Instruction (WBI). Web based instruction is defined as :

'a hypermedia based instructional programme which utilizes the attributes and resources of the world wide web to create a meaningful learning environment where learning is fostered and supported' (Khan, 1997).

In the coming years the design of WBI will require careful consideration and have to be designed keeping the instructional design principles.

Instructional Design is not a very recent concept. It involves some clearly defined skills. Like instructional designers should have high analytical skills, knowledge of learner characteristics, delivery systems and evaluation procedures along with the activity to produce creative, original and effective instructional design solutions. As the role of instructional designers is becoming crucial to successful learning, it is essential to define the core competencies which should be acquired by an instructional designer. Instructional design competencies were originally developed by a group of professionals in 1986. Competency defined by them is *'a knowledge, skill or attitude that enables one to effectively perform the activities of a given occupation or function to the standards expected in employment.'* (1999). Later the Instructional Board of Standards for Training Performance and Instruction (ibstpi) in 1998 listed design competencies which are based on the original set of instructional design competencies.

Keeping this in view, a survey was conducted to find out the competencies required for web based instructional designers. For this a questionnaire was designed based on the set of instructional design competencies of ibstpi board. The methodology is presented in the following section.

Methodology

This study has been based on the widely used survey research method. The objectives of the survey were to :

- find out the background information of the respondents, and
- analyze the competencies essential for web based Instructional Designers.

Instead of using postal mail for the survey, we have used Internet tools to design questionnaire and conduct the survey. Internet, the popular source of information is also a powerful means of communication. Many research studies have taken advantage of this technology. The predominant amongst the Internet tools is email, which delivers questionnaire to respondents very quickly. Mailing lists are also used to receive more

responses and also broadcast about surveys put in the World Wide Web (WWW). Zhang (1999) after a review of literature has identified the following advantages of Internet based survey :

- (a) The research costs for sending questionnaires and coding data are relatively low for Internet-based survey;
- (b) Internet-based survey usually have a short turn around time;
- (c) They reach potential respondents in geographically remote areas;
- (d) When a research topic is of a sensitive nature, Internet-based surveys offer a means to reach a group that is normally difficult to identify or access;
- (e) They offer a means to efficiently survey large numbers of individuals;
- (f) They may increase respondents motivation to participate by providing a dynamic/ interactive survey process; and
- (g) They may reduce errors from transcription and coding, as responses are in electronic format.

For our study, we used commercial software called Web Surveyor. We used a free trial account from <http://www.websurveyor.com> for this purpose. Web Surveyor is a combination of desktop software and Internet service to enable non-technical persons to do online survey. The desktop software enables to design, distribute and analyze the surveys. A survey builder wizard helps novice users to create the survey instrument. It allows users to select question types to include in the survey and insert and delete question/items anytime during the design. A survey publish wizard generates the survey in HTML to launch it in the web of the service provider or your own home page. The Web Surveyor has the following features :

- Unlimited response for each survey
- Question libraries
- Ability of import questions from text file
- Instant survey preview
- Testing of survey before publication
- Support of popular question formats including : True-False, Multiple choice, Rating Scale, Multiple select options, Pull down menu and verbose text
- Unique URL for each survey
- Password controlled environment
- Response analysis with multiple graph types
- Report exporting to MS Office, Lotus Smart Suite, HTML etc.

The system requirements for desktop software are :

- Windows 95, Windows 98, Window NT 4.0 or later
- 8 MB RAM (Win 95); 16 MB RAM (Win NT)
- Standard Internet connection (TCP/IP using Winsock)

- Web browser
- Access to SMTP mail server or installed MAPI compliant email system.

A server solution for the software is also available. Having created a free trial account of the Web Surveyor, we downloaded the desktop software and designed the questionnaire. It has a very user friendly environment and took very little time to create the instrument. The survey instrument was published into service provider's web which gave the unique URL. The questionnaire was posted at <http://websurveyor.net/wsb/dll/3623/cwid.htm> for access by all to respond. Though the desktop software has facility to distribute the survey to a sample group of population, we used two mailing lists to broadcast about the survey. The mailing lists used were Distance Education Online Symposium List (DEOS-L) and International Forum for Educational Technology and Society Discussion List (IFETS Discussion List). One DEOS-L respondent posted the message into another mailing list-Instructional Designer's Forum at Pittsburg University (IDForum). The survey was available for response for a period of 20 days between 19th July 2000 to 7th August, 2000. During this period 105 persons visited the site and filled the questionnaire. The analysis presented in the next section shows the responses of these 105 persons.

However, the results do not always show the total of 105. This might be due to no response to some questions or one or more respondent(s) might have submitted the questionnaire wrongly without filling the questions.

At the time of analysis, we experienced that the software cannot really do sophisticated analysis of data using inferential statistics. Therefore, we present the results only in frequency count and percentages.

Findings

The findings are based on the 105 responses received. The analysis has been presented in the following two sections:

- Background Information of the respondents;
- Competencies for Instructional Designers.

Background Information

Background information of the respondents were collected through this survey. The information collected was mainly about their profession, institutions to which they belong, age, gender, total years of experience in their present profession, involvement in developing web based course materials, the subjects of web based courses and lastly the difficulties each respondent faced while developing these courses. Findings of the background information is presented below :

- The survey showed that out of 105 responses 60 were female and 40 were male respondents. Out of these 42 respondents belonged to the age group 35-44 years. Only 10 respondents were in the age group 55-64 years;
- Majority of the respondents (73) belonged to Universities/Colleges. The rest of the them were affiliated with government offices and business establishments;

- The profession wise break up of the respondents revealed that majority of the responses were from Instructional Designers (35), themselves and minimum respondents were the Readers/Associate Professors (5). Next to the instructional designers, people who responded were from the category of others (34), which includes students, school teachers, administrators, media specialists, educational designers, technologists and the researchers.
- Majority of the respondents (59), had less than ten years of experience. Twenty one respondents had 11-15 years of experience and twenty had more than 20 years of experience.
- Almost all (88) respondents were involved in developing web based course materials. These web based courses were developed on a wide range of disciplines. These are computers, education, journalism, engineering, teacher training, science, special education, military training, languages, nursing, medicine, history, political science, business and management.
- Respondents faced numerous problems in developing web based instruction. The analysis revealed number of reasons. These are broadly classified into technical problems, writing of objectives, achieving high quality of instruction, finance, software capability, time constraint for the designers, help from team members, evaluation of web instruction, resistance to change, administrative and infrastructure support.

Competencies for Instructional Designers

In this section we present the findings of what competencies an Instructional Designer should possess to design web based instruction. The list of competencies, frequency and percentage of responses of each competency is indicated in Table I.

- Objectives are milestones in a learning endeavour. They inform the learner what he /she should be able to do after going through the course/lesson. It gives a clear and concrete direction to the learner and thus learning becomes more meaningful. More than 80 % of the respondents agreed and strongly agreed that the instructional designers should be able to state the objectives in behavioural terms and they should be in logical order.
- Majority of respondents feels that the web-based instructional designers should be able to design instructional material which are to the level of the learners. Designers should be able to identify the target learners and should conduct the need analysis.
- Out of 105 respondents almost 90 have responded in favour of developing performance measures and be able to judge the validity and reliability of the measures used.
- Majority of the respondents (81) agreed and strongly agreed that instructional designers should be able to use variety of software application packages.
- Ninety respondents agreed and strongly agreed that instructional designers should be able to develop formative and summative evaluation plan. Respondents also feel that the designers should develop test items and evaluate instruction.

Table 1 : Competencies for Web-based Instructional Designers

S. No.	Competencies The Web-based instructional Designers should be able to	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1.	State the objectives in behavioural terms	39 (37.86)	39 (37.86)	15 (14.56)	8 (7.76)	2 (1.94)
2.	Sequence objectives in logical order	53 (51.45)	38 (16.89)	8 (7.76)	4 (3.88)	–
3.	Design instructional materials to the level of learners	76 (73.07)	27 (25.96)	1 (0.96)	–	–
4.	Develop the performance measures	46 (44.23)	44 (42.03)	13 (12.5)	1 (0.96)	–
5.	Judge the validity and reliability of the measures used	33 (31.73)	51 (49.03)	19 (18.26)	1 (0.96)	–
6.	Use software application packages	33 (31.73)	48 (46.15)	16 (15.38)	7 (6.73)	–
7.	Explain the process of video production	11 (10.67)	30 (29.12)	31 (30.09)	30 (39.12)	1 (0.97)
8.	Develop formative and summative evaluation plan	43 (41.74)	47 (45.63)	9 (8.73)	4 (3.88)	–
9.	Communicate effectively by visual, oral and written form	68 (65.38)	29 (27.88)	5 (4.80)	2 (1.92)	–
10.	Establish rapport with individuals and groups	67 (64.42)	30 (28.84)	3 (2.88)	3 (2.88)	1 (0.96)
11.	Develop test items and write interactive feedback	40 (38.46)	45 (43.26)	13 (12.5)	3 (2.88)	3 (2.88)
12.	Demonstrate organisational skills and time management skills	53 (50.96)	46 (44.23)	4 (3.84)	1 (0.96)	–
13.	Demonstrate problem solving abilities	60 (58.25)	36 (34.95)	6 (5.82)	1 (0.97)	–
14.	Design textual messages	68 (65.38)	34 (32.69)	2 (1.92)	–	–
15.	Apply principles of page layout design	42 (40.77)	43 (41.74)	12 (11.65)	6 (5.82)	–
16.	Apply current research and theory to the practice of I.D.	56 (53.84)	40 (38.46)	7 (6.73)	1 (0.96)	–
17.	Apply fundamental research skills to I.D projects	32 (30.76)	50 (48.07)	16 (15.38)	6 (5.76)	–
18.	Design curriculum or programme	38 (36.55)	34 (32.69)	19 (18.26)	10 (9.61)	3 (2.88)
19.	Identify the target learners and conduct need analysis	49 (47.11)	35 (33.65)	11 (10.57)	8 (7.69)	1 (0.96)
20.	Analyze the characteristics of existing and emerging technologies	51 (49.03)	45 (43.26)	7 (6.73)	1 (0.96)	–
21.	Evaluate Instruction	51 (49.51)	43 (41.73)	7 (6.79)	1 (0.97)	1 (0.97)
22.	Use Internet and develop educational web sites	59 (57.84)	35 (34.31)	7 (6.86)	1 (0.98)	–
23.	Use web based course management tool	39 (38.25)	43 (42.15)	40 (13.72)	5 (4.90)	1 (0.98)

- It was interesting to note that quite a few respondents (61) feel that the instructional designers need not be familiar with the process of video production which will help them to interact with the producers. The response might be due to the nature of the question which used the term 'explain'. At least one respondent sent a mail to inform that the wording of the statement is not appropriate.
- Almost all (99) respondents feel that the instructional designers should be able to demonstrate organizational, time management and problem-solving skills. Respondents (82) also agree with the ability of applying fundamental research skills to instructional design projects.
- Analysis regarding the ability to design textual messages and apply principles of page layout design by the designers revealed that majority agreed and strongly agreed with these competencies.
- Using Internet, developing educational web sites and using web based course management tool are the competencies which most of the respondents feel that a designer should be able to do. They should also be able to analyze the characteristics of emerging technologies.
- Majority respondents (97) feel that the designers should be able to communicate effectively by visual, oral and written form and, be good in establishing rapport with individuals and groups.

Conclusion

Competency is a conscious activity, which an individual learns through experience or any other event. All professionals become competent in their own fields through experience. The findings of this survey reveal that all instructional designers who are involved in preparing web based courses need some pre-requisite skills. These will help to make the instruction more successful. Survey reveals that designers need analytical skills as well as creative ideas and design ability to design web based courses. The results of the survey show that web-based instructional designers need almost the same set of skills as that of traditional instruction designers. May be the ability to handle course management tools is an area that web-based instructional designers require as special set of skills. The result is not at all surprising as 'instruction design' is the same for traditional or web-based instruction. What is important is the content and how it can be designed for successful learning. Nevertheless, clear understanding of the capabilities of the Internet and WWW enables the instructional designers to design instructions taking the optimum advantages of the media and tools available. Since the web is an integrated medium, it provides a powerful platform to the designers to experiment with new ideas and designs to create successful learning environments.

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