

# Faculty Perceptions of a Case-Based Online Teaching Resource

Yuxin Ma

*University of Louisiana at Lafayette*

Stephen Harmon

*Georgia State University*

This article reports on a qualitative study examining seven higher education faculty members' perceptions of a case library as an online teaching resource. Results from the study revealed that faculty participants' overall perceptions of this case library can be explained by three main factors: perceptions of how this tool supports (a) The Way Faculty Learn to Teach, (b) Perceived Usefulness, and (c) Perceived Usability of the tool. The findings of the study may provide support for decision makers to determine whether they would adopt this type of tool, and offer design guidance for those who want to pursue case libraries as a solution to faculty development. In addition, this study adds to the body of knowledge on how faculty members learn to teach, as well as what types of knowledge and support they need in online teaching.

Keywords: Faculty Development, Online Teaching, Faculty Perceptions

## AN ONLINE TEACHING CASE LIBRARY (OTCL)

Online teaching has become an established practice in higher education (Hill, Wiley, Nelson, & Han, 2003; Moore & Anderson, 2003). However, the quality of online teaching is unsatisfactory (Navarro, 2000; NEA Higher Education Research Center, 2002) and traditional faculty development activities have limited impact on faculty teaching (Davidson-Shivers, 2002; Laga & Elen, 2001; NEA Higher Education Research Center, 2001).

Theory and research in case methods (Merseth, 1996) and case-based reasoning (CBR) (Kolodner, 1993) suggest that a case library may be a beneficial tool to enhance

---

*Yuxin Ma is an Assistant Professor at the University of Louisiana at Lafayette. Dr. Yuxin Ma can be contacted at the University of Louisiana at Lafayette Center for Innovative Learning and Assessment Technologies, PO Box 42051, Lafayette, Louisiana 70504. Phone: (337) 482-1620. E-mail [yuma@louisiana.edu](mailto:yuma@louisiana.edu). Stephen Harmon is an Associate Professor at Georgia State University. Please contact Dr. Stephen Harmon at Georgia State University, College of Education Instructional Technology, P.O.Box 3976, Atlanta, Georgia, 30302-3976. Email: [swharmon@gsu.edu](mailto:swharmon@gsu.edu)*

faculty online teaching. Research shows that teacher knowledge is context-specific and situation-dependent (Calderhead, Clark & Peterson, Clark & Yinger as cited in Merseth, 1996). Teachers operate more from “induction from experiences” rather than “deduction from theoretical principles” (Merseth, 1996, p. 724). Therefore, it is important to provide direct and vicarious experiences to faculty to enhance their teaching. Cases have been used in various areas of teacher education (Merseth, 1996), including technology integration (Krueger, Boboc, & Cornish, 2003; Wang, Moore, Wedman, & Shyu, 2003). CBR (Kolodner, 1993) is another theory that supports the use of case studies in teacher education. CBR describes how human beings rely on concrete past experiences to solve problems. It emphasizes that vicarious experiences should be provided to support problem solving. Researchers in this field have built computer-based case libraries to support teaching and learning (Chandler, 1994; Domeshek & Kolodner, 1992).

To explore the use of a case library as an alternative faculty development solution, we developed a prototype of an Online Teaching Case Library (OTCL) to store online teaching courses and the lessons faculty learned from teaching the courses. The OTCL we developed is a vision prototype (Erickson, 1995) built to communicate to professors the design concepts of a faculty support resource. This tool is based on the conceptual models of tasks, content, and features synthesized from the literature and related projects. These models are represented by text descriptions and flow charts.

The task model describes two types of tasks instructors may accomplish in an OTCL: (a) orientation and issue discovery, and (b) issue exploration and solution generation. During the first task, instructors may explore online courses similar to their own to get oriented in teaching the course online and to discover the potential problems. Once the instructors obtain a general idea of the situation, they may be engaged in the second task of developing solutions to these problems. They may explore how other instructors have addressed similar issues, what have worked and what lessons they have learned.

The content model depicts the types of resources required in an OTCL to support the tasks. These resources are organized into cases and common topics. A case refers to all the resources related to an individual course, including a description of a course, materials used, and lesson learned in teaching the course. A common topic deals with an issue commonly found in online teaching, such as lack of participation in online discussion. It consists of guidelines addressing the issue and the stories that illustrate the guidelines. Stories are drawn from the lessons instructors have learned from teaching online courses.

The model of features connects tasks, content and users by describing how users may access the content in order to complete the tasks. To access a case, users can browse cases by selecting one of the following criteria: subject areas, learner types (graduate or undergraduate), learning objective types, or instructional strategies. They may also search for cases by selecting multiple of these criteria or by simply conducting a keyword search. To access a topic, they may either browse the categories of topics or conduct a keyword search.

The prototype consists of two components represented by over 40 screen mockups developed in HyperText Markup Language (HTML). One component is a case study of an online course that teaches instructional design. It contains an overview of the course design and delivery, course materials, as well as the lessons that the instructor learned from teaching the course. The other component deals with a specific topic of facilitating meaningful discussions in online teaching. These two components represent two main types of resources in the content model. They allow the user to explore an OTCL from the perspectives of examining similar courses or investigating specific issues. Figure 1 is a screen capture of a lesson that an instructor learned from teaching a course online.

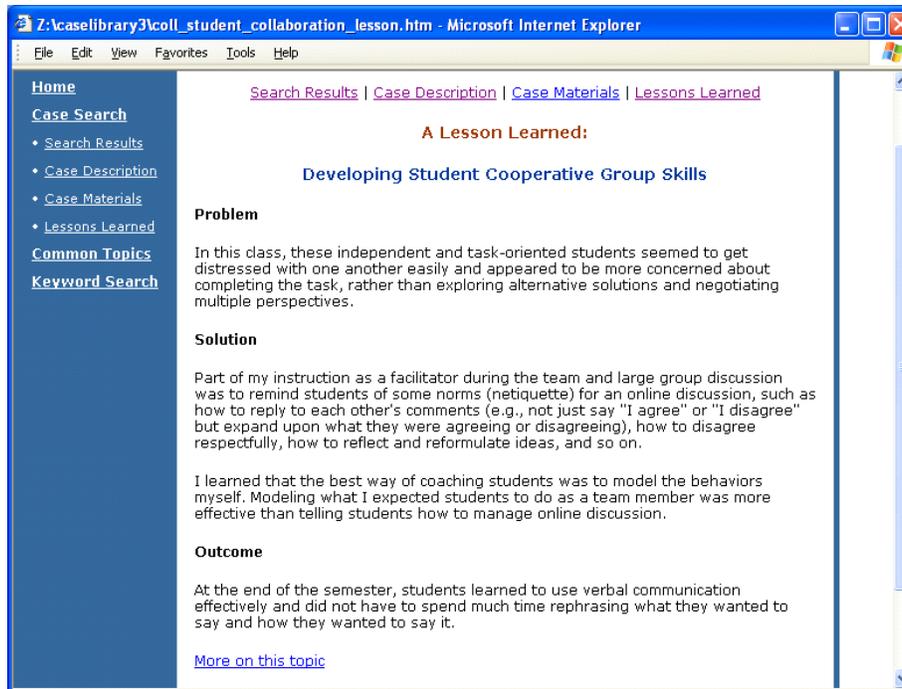


Figure 1. An OTCL screen capture: A lesson learned.

### PURPOSE AND RESEARCH QUESTIONS

The primary purpose of the study was to explore faculty perceptions of an OTCL so that the results might help decision makers and researchers determine whether they would pursue the use of a case library as a faculty support tool. The secondary purpose of the study was to generate high-level design guidelines to inform future development of and research on this or similar case libraries. Four research questions guided the study:

1. How do faculty members perceive a case library as a tool that supports online teaching?
2. What tasks do faculty members perceive that they would accomplish in a case library that supports online teaching?
3. What types of content do faculty members perceive that they would need in a case library that supports online teaching?
4. What major system features do faculty members perceive that they would need in a case library that supports online teaching?

### METHOD

This study employed qualitative methods to gather and analyze data because of the exploratory nature of the study (Creswell, 2004). The four research questions all focus on faculty perceptions. From the phenomenological perspective, an examination of related experiences is critical to understanding perceptions (Patton, 2002). Therefore, to examine faculty perceptions of an OTCL, this study explored participants' online teaching experiences as well as their experiences in using an OTCL.

## PARTICIPANTS

Seven faculty members participated in the study (see Table 1). They were from a variety of backgrounds and disciplines, with different amounts of experience related to online teaching and case-based pedagogy. Four of them were identified as experienced online instructors and three were classified as novice online instructors. They offered insights on this OTCL from diverse perspectives. The names listed below are pseudonyms.

*Table 1. Participant Teaching Experience and Familiarity with Case-Based Pedagogy*

Participant	Years of Teaching	Online Teaching Experience	Familiarity with Case-Based Pedagogy
Dr. Randal	30	Experienced	Familiar
Dr. Campbell	4	Experienced	Familiar
Dr. Robinson	15	Experienced	Unfamiliar
Dr. Smith	3	Novice	Unfamiliar
Ms. Nelson	20	Novice	Unfamiliar
Dr. Davis	15	Novice	Familiar
Dr. Walker	30	Experienced	Familiar

A faculty member's amount of online teaching experience was determined by  $E = (1 \times Y) + (2 \times C) + (1 \times (S-C))$  where E is the amounts of online teaching experience; Y is the number of years teaching online; C is the number of different courses taught online; and S is the number of sessions taught online. For rationale behind the measure, please see Ma (2005). If a faculty member had an E score greater than or equal to 16, we categorized him/her as an experienced online instructor; if a professor had an E score less than 16, we classified him/her as a novice online instructor. We derived this cut-off score by consulting staff in a university department responsible for working with faculty on online teaching (Ma, 2005). This is a comparative measure developed for the purpose of identifying participants for this study. The measure has not been validated. With an awareness of the potential limitation of the measure, we recruited participants who clearly fell into two categories: those who had much online teaching experience and those who never taught or just started to teach online. Future studies may be needed to create an independent measure for defining novice vs. experienced online instructors.

## DATA COLLECTION AND ANALYSIS

We followed a three-step contextual interview procedure to collect data: the initial interview, artifact evaluation and the final interview (Figure 2). The contextual interview (Beyer & Holtzblatt, 1998; Holtzblatt & Jones, 1993) is an ethnographic field method in systems design. In this study, it involved observing and interviewing faculty participants while they were interacting with the conceptual models and the prototype. For each participant, the contextual interview occurred in one session and ranged from an hour and 40 minutes to 2 hours and 10 minutes.

The initial interview examined faculty experiences with online teaching and case-based pedagogy, which provide a context for reflective exploration of the prototype. It usually took about twenty to thirty minutes. The interviewer asked participants about their teaching and online teaching experiences and their initial perceptions of a case library as an online teaching resource.

The artifact evaluation procedure involved the participants in exploring and evaluating the prototype. It usually lasted about eighty minutes. It has the following steps:

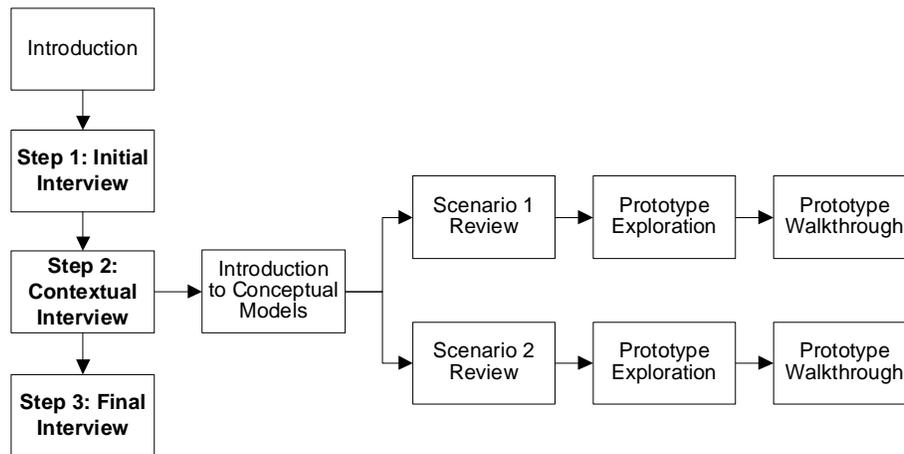


Figure 2. Data gathering procedure for the study.

1. Concept introduction and initial feedback. The interviewer presented the conceptual models of tasks, content, and system features to the participants and asked for reactions to the models. These models describe the main concepts supported by the prototype.
2. Scenario review. The interviewer presented two scenarios to the participant. One scenario describes an instructor's need to explore how professors in the field are teaching a certain course online. The other scenario deals with the need to tackle the issue of lack of meaningful participation in online discussion. After presenting the scenarios, the interviewer asked the participants about their thoughts of the scenarios and similar experiences they had. Participants' personal experiences provided authentic situations for them to interact with the prototype.
3. Prototype exploration. The interviewer observed and interviewed the participants while they were exploring the prototype to complete the tasks described in the scenarios. For example, Ms. Nelson was exploring the OTCL to identify how other professors teach an online course in her field, in this case, an undergraduate Spanish course. Although the cases in the OTCL are not directly related to Spanish teaching, the prototype provided example content and features for Ms. Nelson to determine whether the types of content and features represented by the example could meet her needs in the context of teaching Spanish online. The interviewer observed Ms. Nelson and asked questions to understand her thought process, expectations, as well as likes and dislikes of the prototype.
4. Prototype walkthrough. At the end of the prototype exploration, if the participants failed to explore all the features of the prototype, the interviewer conducted a prototype walkthrough to introduce unexplored features and asked for reactions.

The final interview examined follow-up questions, the participants' overall perceptions of an OTCL, and demographic information. It generally took about five to

ten minutes. It gave the participants an opportunity to step back from the details so as to examine their overall perceptions of the prototype.

In this study, the works of Miles and Huberman (1994) as well as LeCompte and Schensul (1999) guided data analysis. First, we transcribed video and audio data and combined them to generate transcripts. Then, we coded the transcripts into conceptual chunks and grouped them into categories. Next, we drew flow charts to display and make sense of the relationship among the categories. Finally, we wrote up conclusions and verified them.

To enhance the trustworthiness and rigor of this study, we addressed the following issues: credibility, dependability, confirmability, and transferability (Lincoln & Guba, 1985). Detailed procedures for handling these issues in this study can be found in Ma (2005).

**RESULTS**

*OVERALL PERCEPTION OF AN OTCL*

Faculty members’ overall perceptions of an OTCL focus on their decision to use this tool. Figure 3 shows that professors’ perceived decision to use an OTCL can be explained by three main factors: (a) The Way Faculty Learn to Teach, (b) Perceived Usefulness, and (c) Perceived Usability of this OTCL. For the ease of communication, this figure is called Model of Perceived Decision to Use OTCL (MPDUO). The following presents the three factors.

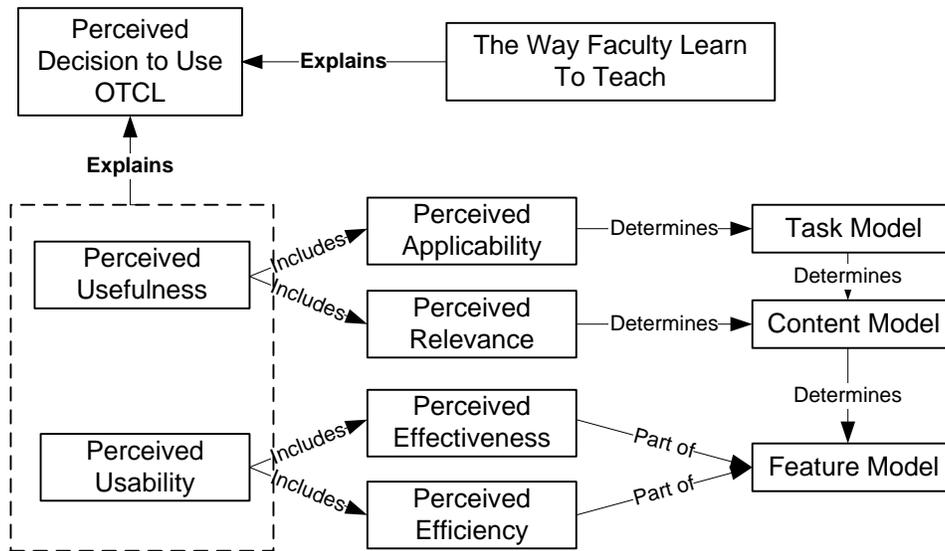


Figure 3. Model of perceived decision to use an OTCL (MPDUO).

*Factor 1: The way faculty learn to teach.* The first factor that impacts faculty participants’ perceived decision to use an OTCL is their belief of how this tool might support the way they learn to teach. Faculty participants reported that they took an apprenticeship approach to learning to teach. They learned primarily from their own or other professors’ experiences. They believe that an OTCL could support this type of learning. It could serve as an alternative to human mentors by offering faculty a variety of perspectives and providing them with experiential knowledge at the time when they need

it. For example, Dr. Robinson stated that an OTCL could support her way of learning how to teach:

This is something that is more similar to the way that I learn. I'm not so good with going some place, reading directions on how to set something up, and doing all of that, and not being really sure about what issues may arise, how you handle certain things. I think just from the more personable type of view point, that would be helpful for me because it would give you that idea that here is another person who's been in a similar situation, and these are the things that they chose to do. I think this will save a lot of time

Despite this positive perception, faculty might not adopt an OTCL unless the other two factors, usefulness and usability, are also addressed.

*Factor 2: Usefulness of an OTCL.* This factor consists of two dimensions: applicability and relevance. Applicability refers to the need for an OTCL to support course design and delivery and to serve faculty who have different amounts of experience and preferences. This factor relates to the types of tasks professors may be engaged in while using an OTCL. Relevance is another dimension. It describes participants' requirement that an OTCL should provide all the resources pertinent to their tasks, regardless of whether the resources are related to pedagogy, content, or technical solutions. This factor determines the types of content in an OTCL.

*Factor 3: Usability of the OTCL.* Usability has two dimensions: effectiveness and efficiency. Effectiveness refers to the requirement for an OTCL to provide understandable language for the user to successfully communicate with the tool. Efficiency is another important dimension of usability. Faculty wanted to quickly access the content to carry out their tasks. Both dimensions, effectiveness and efficiency, are part of the non-functional features of an OTCL.

Faculty members with different amounts of online teaching experience varied in their overall perceptions of an OTCL. Compared to novice online instructors, experienced online instructors better perceived the match between an OTCL and professors' apprenticeship approach to learning to teach. They also had more detailed vision of how an OTCL could support online teaching. Novice online instructors, however, were more concerned of the usefulness and usability of an OTCL, and they were more forthright in pointing out that they would not use an OTCL unless it could meet their needs. Their concern might be explained by the fact that the prospect of teaching online is already a challenge for novice online instructors; the idea of having to learn to use another tool in order to teach online can add to the stress. Despite their concerns, however, novice online instructors became more positive toward an OTCL once they had more experience with this OTCL.

### PERCEPTIONS OF TASKS

The tasks that participants perceived that they would carry out in an OTCL can be categorized as three primary tasks and two secondary tasks (Figure 4). The primary tasks include exploring possibilities, discovering issues, and identifying problem solutions. They serve as the purposes for professors to use an OTCL during course design and delivery. The secondary tasks consist of contributing to an OTCL and identifying the associated technical solutions. The need for completing the secondary tasks may naturally arise as the professors perform the primary tasks. The following paragraphs briefly describe both the primary and secondary tasks.

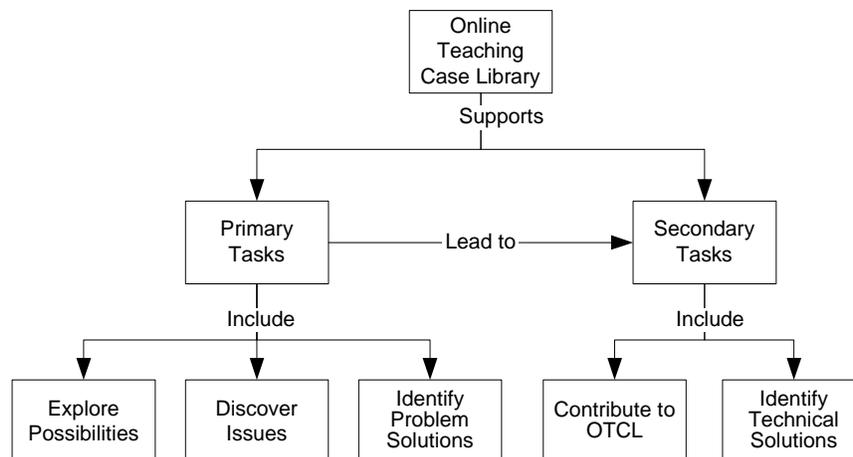


Figure 4. OTCL evolved task model.

*Exploring possibilities.* Two participants perceived that they might use an OTCL to help them explore the different possibilities of online teaching while designing a new course. For example, Dr. Robinson mentioned that at the beginning of the school year, she might need resources to help her set things up for a new course. She would explore all the possibilities to find out what other faculty were doing in their class and what instructional components worked for them. At the time of the interview, she was in this situation. She just assumed a new job and was switching from Blackboard to WebCT. She wanted to review examples of online courses delivered in WebCT to see what the possibilities were. One participant believed that this task could also be appropriate for someone who is contemplating alternative ways of teaching or online teaching.

*Discovering issues.* Two participants pointed out the need for identifying potential issues when teaching online. Ms. Nelson stated that it is important for instructors to complete this task early in teaching so that they could avoid problems that others have encountered. Dr. Robinson shared a similar view. She would look at the problems other people had so that she could include related information in her courses to address these problems.

*Identifying problem solutions.* Solution identification is another important task that participants discussed. Two participants wanted discipline independent solutions. For example, Dr. Randal needed to know how other professors embedded critical thinking related writing assignments in online courses; Dr. Campbell was interested in finding out how to communicate more efficiently with students in the online environment. Ms. Nelson, however, requested more discipline dependent information. She wanted to find out how other professors taught discipline specific topics such as indirect object pronouns in a foreign language.

*Identifying technical solutions.* This is a secondary task. When professors perform the primary tasks, they may need to identify technical solutions related to the primary tasks. For example, Dr. Robinson started with the primary task of addressing a problem in online discussion. She found that debate might be a solution to the problem. To implement the solution in her class, she was soon engaged in the secondary task of seeking technical solutions on how to facilitate a debate in WebCT, a course management tool that she was using.

*Contributing to an OTCL.* Two participants stated that encouraging faculty to contribute to an OTCL may increase faculty reflection, therefore making the OTCL a “living document” that supports sharing of multiple perspectives among faculty.

Moreover, Dr. Campbell stated that adding to the knowledge base would make her feel that she could contribute to the community and her opinion counts. However, there are issues with this task. For example, Ms. Nelson stated that a novice online instructor like herself might not have much to contribute. Time and motivation are another two concerns. Dr. Smith mentioned that she would not post a story or comment because of the requirement of time. Dr. Robinson raised the related issue of motivation. She stated that adding a whole story requires time, so a faculty member might need incentives for making contributions.

Participants with different amounts of online teaching experience had different perceptions of the tasks. Novice online instructors tended to focus on exploring possibilities and identifying issues in online teaching, whereas more experienced instructors were apt to use an OTCL to identify solutions to specific problems. In addition, as expected, novice online instructors such as Ms. Nelson were reluctant to contribute to an OTCL, because she felt she would not have much to share because of her limited online teaching experience.

*PERCEPTIONS OF TYPES OF CONTENT*

The types of content that participants perceived that they would need in an OTCL include both primary types and secondary types of content (Figure 5). The primary types of content consist of cases and topics. The secondary types of content include user stories, comments, and technical resources. The following paragraphs provide a brief description of these types of content.

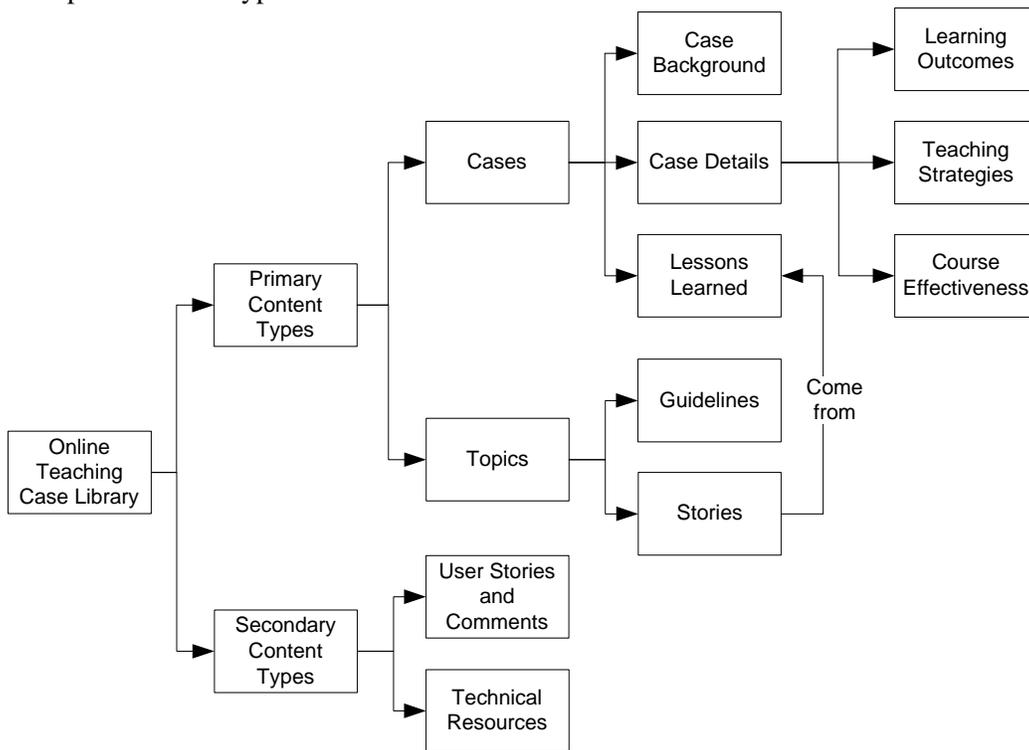


Figure 5. OTCL evolved content model.

*Cases.* Participants required three main components from a case: case background, case details, and the lessons that the instructor has learned from teaching a course.

Participants perceived that the case background could give them a sense of how their own situations match up with the case described in the prototype, but they cautioned that background information is secondary or sometimes even irrelevant to them. Instead, the description of how a professor actually taught a course is the core information they were seeking.

Case details, the second component of a case, consist of three parts: learning outcomes, teaching strategies, and course effectiveness. Case details are very important to the participants. Ms. Nelson stated that “how you go about doing this course and what you do in the course” is the “meat of what’s going on here.” She was “interested in what they are going to cover and how they are going to cover it” in relevant courses. Other faculty participants expressed similar interests. They needed the details and specifics about teaching strategies in order to understand how they were implemented. For example, while reviewing the synopsis of a problem solving activity in this OTCL, Dr. Robinson stated that she wanted to see what problems the instructor used, what documents and questions s/he posted, how the activity was set up, and what the discussion forum looked like. She said, “I’m such a visual learner. I need to see it in order to really understand it ... Only reading it would be really difficult for me to have an accurate picture of what’s going on.”

The third component of a case, the lessons a professor learned from teaching a course, describes the professor’s reflections of teaching experience. A lesson learned is presented in the format of a problem, a solution, and outcomes. Two participants considered this as the most useful component in an OTCL. They maintained that lessons learned could help instructors “take advantage of somebody else’s experience” instead of “reinventing the wheel.” It is an area that has been ignored. Dr. Robinson stated that “many times part of what you never hear about is what happens if you ran into this certain difficulty.” Dr. Walker believed that technology may help sharing faculty experiences:

A colleague that I worked with a few years ago, when he retired he said “the saddest about my retirement is I leave no legacy and whoever takes my job is going to have to learn the same lessons that I have learned.”... that’s not necessary, especially with the technology we have today.

*Topics.* Topics are another type of primary content. Unlike cases, which organize content by courses, topics organize content by themes. A topic is represented by two components: guidelines and the associated stories. Guidelines are theory-based principles on how to address certain issues. They are supported by stories, which illustrate the principles with narratives describing the lessons professors have learned from their teaching experiences. Four participants maintained that stories are more relevant to them than the guidelines. For example, Dr. Robinson stated that “the stories are more what I would be looking for immediately.” Ms. Nelson commented that “theories just go over my head some days.” Dr. Davis could not agree more:

It is where (the) rubber meets the road... Theory is wonderful in lots of instances, but these are the people who stand in front of the classes and who are addressing a problem in a current, real-time environment. And I like to know how they handle it. I think that’s something we all share together.

Dr. Walker provided an explanation for faculty preference for stories. He suggested that authenticity in the stories is what makes the stories special. He stated:

It makes it personal, and gives it a ring of authenticity. What I think a lot of us are used to seeing is a list of helpful hints, do this, do this, do this, do this. And that may be ok but having someone personalize it – I was facing that problem, here is what I did with it – Oh, Ok, and now I can take from it, that sounds like ... something that will work for my

students, or it doesn't. But I know that it is a real suggestion that someone really used, as opposed to the authors storming out ideas. So the authenticity of it is what strikes me.

*Technical resources.* Technical resources are a secondary type of content requested by participants. In this study, the prototype of an OTCL was designed to provide pedagogical support rather than technical assistance. However, participants wanted an OTCL to be a "one-stop shop" where they could access all the resources on online teaching, including technical support. Dr. Robinson discussed the linkage between technical and pedagogical issues, which helps explain why professors may need technical resources in an OTCL:

But the technical aspects are so often linked to pedagogical types of issues such as how I bring a guest speaker into the room, what would you do? What's the scenario if someone brought in a guest speaker? How do they handle it? How do they set it up? What do they do with the students? What were the expectations? So it's both technological and pedagogical...

Dr. Randal stated that the usefulness of an OTCL would depend on whether she could easily adapt something to meet her needs. She said:

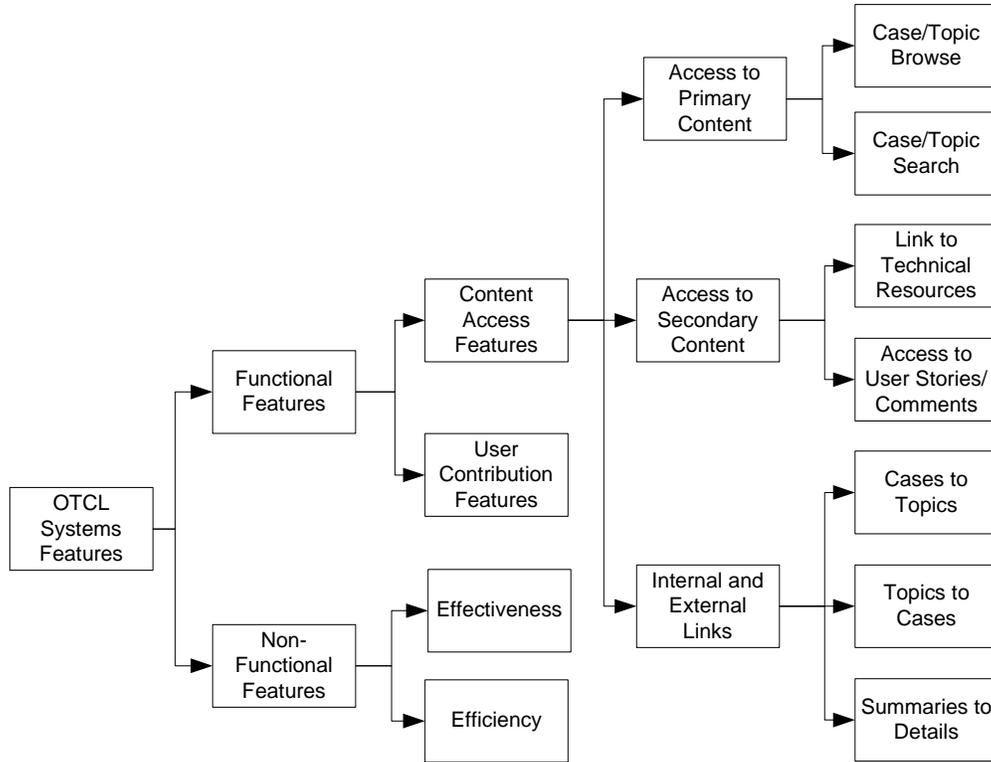
It will have to have the components that tell me exactly what to do. It wouldn't do me any good just to see it. I would need to know that, you know, this is the form you fill out to make this happen, you know. These are the limits to what you can do. That kind of thing. It wouldn't help me just to see what someone has done and then have to try to figure out what technology can make it happen.

*User stories and comments.* Another type of secondary content is user stories and comments. Participants described several types of stories or comments they would contribute. For example, When she was reading the "getting to know you" activity in an OTCL, Dr. Randal stated that she might have another activity that she would want to add as a story, or she might add a comment stating that the activity posted would work better for her if it was modified in a certain way. Dr. Davis mentioned another type of comments he may contribute. If he is unclear about a story or needs more information about what the storyteller has learned, he might post a comment.

Participants with different amounts of online teaching experience perceived the content types a little differently. Dr. Walker stated that at the beginning of online teaching, he would tend to look at examples of cases, and as he becomes "more comfortable and more competent," he would be more prone to examining topics.

#### *PERCEPTIONS OF SYSTEM FEATURES*

The system features that faculty members perceived that they would need fall into the categories of functional and non-functional features (Figure 6). Functional features are the services that an OTCL provides to enable professors to accomplish their tasks. These features include content access features and user contributions features. Non-functional features describe how well the system provides the functional features. Non-functional features consist of two usability dimensions: effectiveness and efficiency.



\* The arrow indicates that a type of features includes sub-types of features.

Figure 6. OTCL evolved conceptual model of features.

*Content access features.* The first type of functional features is content access features. They give users various means to access the primary and secondary types of content; they also provide internal links among different types of content or external links to other resources. Dr. Walker used an analogy to summarize the need for providing multiple content access features.

I tend not to pick up a dictionary and start looking at the A's and the B's and the C's. When I grab a dictionary, I look for something very specific. On the other hand, when I am learning something new, I pick up the textbook, I might browse through the book to see what strikes me as being important... So... different tool(s) (are required) for different tasks. And I need the multiple tools.

Case browse, topic browse, case search, and topic search are four content access features that provide access to the primary types of content; links to technical resources and access to user stories and comments are two types of features that enable the retrieval of secondary types of content; cases to topics, topics to cases, and summaries to details are three types of features that give users flexibility to navigate among different types of content in and out of an OTCL.

*User contribution features.* The second type of functional features is user contribution features. They include adding stories and adding comments. Five participants liked these features, whereas Dr. Smith stated that she would not post anything on the Web, but she might contribute if it is something as interactive as a listserv. Dr. Davis also seemed to think direct communication would be more interactive than posting comments on the Web.

Participants identified two logistical issues with user contributions. Three of them recommended that user postings be monitored, because information might be posted in the wrong place or users might contribute extreme experiences which could either “scare some people off” or set unrealistic expectations. A related issue involves how to determine the appropriate level of control the moderator should have over user contributions. Dr. Campbell was concerned that the moderator might exert too much control. For example, the moderator might think highly of certain content in an OTCL so as to let users post only positive comments. In contrast, there might be situations where control is needed. Dr. Walker hinted that the moderator should not allow the posting of clearly inappropriate instructional advices.

*Effectiveness: language issues.* This is the first type of non-functional features. Faculty suggested that an OTCL can be effective if the following four language issues are addressed. First, participants’ understanding of some key terms differs from their intended meanings. For example, in this OTCL, the term “case” refers to an online course, whereas faculty participants tended to think of cases as specific issues, similar to the concepts of lessons learned or topics in this OTCL. This has caused problems for participants when they were exploring the prototype.

Second, participants did not know what keywords to use when conducting a keyword search. This has discouraged them from using this feature. Two participants suggested that a list of vocabulary be provided to enhance this feature.

Third, the indexing vocabulary used in this OTCL sometimes failed to match the terminology that participants had in mind. An indexing vocabulary was rapidly developed in the prototype to assist faculty to conduct a case search. This allows faculty to search a case by choosing one or multiple subject areas, learning outcomes, instructional strategies, and student types. The terminology provided in the prototype is inadequate in meeting the needs of the participants.

Fourth, the terms used for hyperlinks were sometimes a source of confusion for the users. Three participants reported that they would use different terms than the ones used in this OTCL.

*Efficiency: information presentation and organization issues.* Efficiency is another non-functional feature that participants requested during the interviews. In addition to explicitly stating that they wanted an OTCL to be quick to use, participants pointed out that the following information presentation and organization issues should be addressed to achieve system efficiency: (a) Headings should be meaningful; (b) Information presentation should be concise; (c) Important information should be placed at the top of the page; and (d) Cases and topics should be clustered when there is a long list of them on a page.

Participants with different amounts of online teaching experience perceived some features differently. Compared to experienced online instructors, novice online instructors were more concerned with effectiveness and efficiency, and they might not add stories or comments to this resource.

## DISCUSSIONS AND IMPLICATIONS

The first purpose of this study was to identify the initial support for or evidence against an OTCL. The findings of the study indicate that faculty might use an OTCL, because it supports the way that they learn to teach. However, there are many challenges involved in making such a tool useful and usable. For example, this study indicates that faculty may have diverse needs and may look for both discipline dependent and independent resources. It would be challenging to gather a lot of information to make an OTCL useful. Many usability related language and information presentation and

organization issues have emerged from this study. It would require a significant amount of time and resources to address them.

The second purpose of this research was to generate design guidelines that help with the development of case libraries in the similar context. The findings of this study suggest the following three high level design principles.

1. An OTCL should enhance the perceptions that this tool supports the way faculty learn to teach. A metaphor of a human mentor can be embedded in the user interface to enhance the perception that an OTCL serves as an electronic mentor who provides just-in-time guidance to faculty members in the format of stories and lessons learned.
2. An OTCL should enhance Perceived Usefulness of an OTCL. For an OTCL to be a useful tool, it should support a community of faculty members who share and collaboratively develop online teaching knowledge. It should serve as a “one-stop shop” to provide both pedagogical and technical support to online teaching with a variety of resources, including pedagogical knowledge, content specific pedagogical knowledge, content knowledge, as well as technical knowledge.
3. An OTCL should enhance the Perceived Usability of an OTCL. An OTCL should provide multiple features for quick access of the content, use a common language to communicate to the user, and support different needs of both novice and experienced online instructors.

In addition to addressing these two purposes, this study has contributed to the following areas of theories and research. First, this study adds to the body of knowledge on how faculty members learn to teach. Similar to the findings in related research (Entwistle & Walker, 2000; Hativa, 2000; McAlpine & Weston, 2000), professors in this study learned to teach from trial and error; they took an apprenticeship approach toward learning to teach; vicarious experiences of other professors were important in their learning.

Second, this study enriches the understanding of the types of knowledge faculty might need while learning to teach online. Consistent with the literature (McAlpine & Weston, 2000; Shulman, 1987; Weimer, 2001), this study confirms that faculty members may need general pedagogical knowledge, pedagogical content knowledge, content knowledge, and experiential knowledge. In addition, this study reveals that faculty members may require directly applicable technical knowledge presented together with other types of knowledge to support their online teaching. This is a unique contribution of this study.

Third, this study adds to the understanding of the types of support faculty might need in online teaching. Consistent with previous research (Carbonaro, Snart, & Goodale, 2002; Laga & Elen, 2001), this study found that faculty perceived that they would need experiential knowledge representing multiple perspectives to be provided in a just-in-time manner. In addition, this study found that the types of support faculty might need are driven by their purposes of using this resource. They wanted a “one-stop shop” to access content, pedagogical, and technical knowledge to achieve their goals. This finding is in contrast to our original intention to design a tool that solely focuses on providing pedagogical support. Further, faculty would need a tool that allows them to contribute their own experiences. This has expanded the original vision of this tool from a resource that provides professors with vicarious online teaching experiences to a tool that evolves and grows when faculty share and add to the knowledge base over time. This focus on the role of community in teacher learning is shared by the increasing number of faculty learning communities developed in American universities to foster knowledge sharing and construction among professors (Cox & Richlin, 2004).

Fourth, this study provides some support for adopting electronic performance support systems (EPSSs) and knowledge management systems (KMSs) in faculty development from the perspective of faculty perception. An OTCL has the characteristics of an EPSS (Gery, 1991) and a KMS (Alavi & Leidner, 2001). It can be thought of as a component of EPSS because it purports to provide just-in-time support with a repository of resources; it is also a knowledge management tool because it may capture faculty online teaching knowledge and help develop a community that practices online teaching. EPSSs and KMSs both originated from business and industry (Gery, 1991); some researchers (Barab, MaKinster, Moore, Cunningham, & The ILF Design Team, 2001; Wang et al., 2003) have made efforts to adopt these approaches in the educational settings to share knowledge and provide on-demand information, resources, and tools to teachers. However, most of these projects focus on teacher education students rather than higher education faculty. This study is unique in that it provides an in-depth description of faculty perceptions of a tool that takes the EPSS and KMS approach to faculty development.

Finally, this study enriches the understanding of how individuals with different amounts of experience perceive a knowledge sharing tool. When the OTCL was originally designed, we assumed that novice online instructors may have more positive perceptions of the tool, because they need assistance to obtain online teaching expertise. Surprisingly, experienced online instructors expressed more positive perceptions of OTCL than novice online instructors. This finding is corroborated by a knowledge management case study (Leonard & Kiron, 2002), in which the researchers expected that the users of the knowledge management systems would be mainly novices, but it turned out that many of the users already have much experience but lack experiential knowledge in certain areas. These findings indicate that knowledge management tools can be designed to meet the needs of both novices and those who already have some experience.

## REFERENCES

- Alavi, M., & Leidner, D. E. (2001). Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, 25(1), 107-136.
- Barab, S. A., MaKinster, J. G., Moore, J. A., Cunningham, D. J., & The ILF Design Team. (2001). Designing and building an on-line community: The struggle to support sociability in the inquiry learning forum. *Educational Technology Research and Development*, 49(4), 71-96.
- Beyer, H., & Holtzblatt, K. (1998). *Contextual design: Defining customer-centered systems*. San Francisco: Morgan Kaufmann.
- Carbonaro, M., Snart, F., & Goodale, C. (2002). Faculty of education staff development. In C. Crawford, D. A. Willis, R. Carlsen, I. Gibson, K. McFerrin, J. Price & R. Weber (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2002* (pp. 634-638). Chesapeake, VA: AACE.
- Chandler, T. N. (1994). The science education advisor: Applying a user centered design approach to the development of an interactive case-based advising system. *Journal of Artificial Intelligence in Education*, 5(3), 283-318.
- Cox, M. D., & Richlin, L. (2004). Editors' notes. *New Directions for Teaching & Learning*, 97, 1-4.
- Creswell, J. W. (2004). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (2nd ed.). Upper Saddle River, NJ: Merrill Prentice Hall.
- Davidson-Shivers, G. V. (2002). Instructional technology in higher education. In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (pp. 256-268). Upper Saddle River, NJ: Merrill Prentice Hall.
- Domeshek, E. A., & Kolodner, J. L. (1992). A case-based design aid for architecture. In J. S. Gero (Ed.), *Artificial intelligence in design '92* (pp. 497-516). Dordrecht, The Netherlands: Kluwer Academic.
- Entwistle, N., & Walker, P. (2000). Strategic alertness and expanded awareness within sophisticated conceptions of teaching. *Instructional Science*, 28(5-6), 335-361.
- Erickson, T. (1995). Notes on design practice: Stories and prototypes as catalysts for communication. In J. M. Carroll (Ed.), *Scenario-based design: Envisioning work and technology in system development* (pp. 37-58). New York: Wiley.
- Gery, G. (1991). *Electronic performance support systems*. Tolland, MA: Gery Associates.
- Hativa, N. (2000). Becoming a better teacher: A case of changing the pedagogical knowledge and beliefs of law professors. *Instructional Science*, 28(5-6), 491-523.
- Hill, J. R., Wiley, D. A., Nelson, L. M., & Han, S. (2003). Exploring research on Internet-based learning: From infrastructure to interactions. In D. H. Jonassen (Ed.), *Handbook of research on educational communications and technology: A project of the Association for Educational Communications and Technology* (2nd ed., pp. 433-460). Mahwah, NJ: Lawrence Erlbaum Associates.
- Holtzblatt, K., & Jones, S. (1993). Contextual inquiry: A participatory technique for system design. In D. Schuler & A. Namioka (Eds.), *Participatory design: Principles and practices* (pp. 177-210). Hillsdale, NJ: Erlbaum.
- Kolodner, J. L. (1993). *Case-based reasoning*. San Mateo, CA: Morgan Kaufmann.

- Krueger, K., Boboc, M., & Cornish, Y. (2003). InTime: Online video resources for teacher educators featuring technology integration in preK-12 classrooms. *Educational Media and Technology Yearbook*, 28, 183-197.
- Laga, E., & Elen, J. (2001). Characteristics of support initiatives to stimulate professional development on ICT. In B. Gillan & K. McFerrin (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2001* (pp. 692-697). Chesapeake, VA: AACE.
- LeCompte, M. D., & Schensul, J. J. (1999). *Analyzing & interpreting ethnographic data*. Walnut Creek, CA: Altamira Press.
- Leonard, D., & Kiron, D. (2002). *Managing knowledge and learning at NASA and the Jet Propulsion Laboratory (JPL): Harvard Business School Case 603-062*: Harvard Business School.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
- Ma, Y. (2005). *Exploring faculty perceptions of a case library as an online teaching resource*. Unpublished doctoral dissertation, Georgia State University, Atlanta, GA.
- McAlpine, L., & Weston, C. (2000). Reflection: Issues related to improving professors' teaching and students' learning. *Instructional Science*, 28(5-6), 363-385.
- Merseth, K. K. (1996). Cases and the case method in teacher education. In J. Sikula (Ed.), *Handbook of research on teacher education* (pp. 722-744). New York: Simon & Schuster/Macmillan.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded source book* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Moore, M. G., & Anderson, W. G. (2003). *Handbook of distance education*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Navarro, P. (2000). The promise - and potential pitfalls - of cyberlearning. In R. A. Cole (Ed.), *Issues in web-based pedagogy* (pp. 281-296). Westport, CT: Greenwood Press.
- NEA Higher Education Research Center. (2001). Focus on distance education. *NEA Higher Education Research Center Update*, 7(2). Retrieved January 4, 2007 from [www2.nea.org/he/heupdate/images/vol7no2.pdf](http://www2.nea.org/he/heupdate/images/vol7no2.pdf)
- NEA Higher Education Research Center. (2002). The promise and the reality of distance education. *NEA Higher Education Research Center Update*, 8(3). Retrieved January 4, 2007 from <http://www2.nea.org/he/heupdate/images/vol8no3.pdf>
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57, 1-22.
- Wang, F., Moore, J. L., Wedman, J., & Shyu, C. (2003). Developing a case-based reasoning knowledge repository to support a learning community - An example from the technology integration community. *Educational Technology Research and Development*, 51(3), 45-62.
- Weimer, M. (2001). Learning more from the wisdom of practice. *New Directions for Teaching and Learning*, 86, 45-56.