



The Texas Course Redesign Learning Object Repository: Research and Development for a Production System

An Outcome-Based Evaluation Plan for the Texas Course Redesign Repository

DRAFT FOR REVIEW BY THECB

Prepared by

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An Outcome-Based Evaluation Plan for the Texas Course Redesign Repository

1. Introduction

One component of the Texas Course Redesign Learning Object Repository Project (Phase II) was to develop a draft outcome-based evaluation plan. As stated in our proposal for this project, “It is important to plan for ongoing assessment of the LOR once it becomes fully operational. We propose to develop an outcome-based evaluation plan for assessing the operational LOR. In collaboration with the Texas Higher Education Coordinating Board (THECB), we will identify outcomes, indicators, and measures to be used in assessing the LOR. We will develop an evaluation plan that indicates what, how, and when data will be collected and the appropriate data analysis procedures.” This document presents this evaluation plan.

Ongoing evaluation is important for any service or program, and especially important in the first year of a new service or program. The evaluation activities described in this plan are intended to yield information for the THECB about the Texas Course Redesign Repository (TCRR) and the extent to which it is advancing the goals and objectives defined by the THECB. The overarching question the evaluation question targets is the extent to which the TCRR is producing the desired results for the stakeholders, including THECB, state officials, higher education administrators and instructors, students and their parents, users and developers of educational resources, and the general public. The evaluation plan can also be used to collect data to inform future enhancements and services to the TCRR as it evolves and addresses new requirements to meet the anticipated needs of the stakeholders and intended users.

The sections that follow describe the three aspects of the TCRR to be assessed, the logic model of the evaluation, and a proposed set of outcomes, indicators, and data collection methods to be used in assessing the fundamental effectiveness of the operational TCRR.

At the time we proposed our work on the TCRR, we and the THECB anticipated that the repository would be implemented as a stand-alone system operated by the Texas Digital Library. However, the THECB has entered into an agreement with the University of Texas Telecampus to begin building a statewide learning object repository (LOR). The plans at this point are to have the contents of the Texas Course Redesign Project currently in the TCRR to be migrated to the new LOR. Since the TCRR content will be integrated into the statewide LOR, certain aspects of this plan will need to be modified. For example, aspects of the TCRR such as its user interface and structure may not be used in the statewide LOR. Our hope is that ideas and suggestions presented in this plan can serve as a foundation for an outcome-based evaluation plan that is useful to the statewide LOR.

2. Focal Areas for Outcome-based Evaluation of the TCRR

We frame the evaluation plan with a focus on three critical areas: access, use, and impact. Specifically, the plan addresses information will be collected regarding how the site is being accessed, how the content from the LOR is being used, and its impact on users. The outcomes (discussed in Section 5) are categorized into these focal areas. The proposed evaluation of the TCRR does not focus simply on the use of the repository; it also addresses the use of course content, and the longer-term impacts of both the TCRR and its contents. Outcome-based evaluation is interested in assessing the impact of a program or service on changes in knowledge, behavior, skills, and other attributes of the target audience (Institute of Museum and Library Services, 2000).

The contents of the TCRR are meant to be accessed and used by faculty and instructional designers at public institutions of higher education in Texas. The TCRR is a web-accessible application, allowing the use of commonly used web browsers to access, search, browse, select, view, and download learning objects.

Evaluation activities will collect data to assess the accessibility of the TCRR to users and provide general demographic data about users that will help identify and bridge gaps in reaching the intended or target audience.

Key questions for evaluation of **access** include:

- Who is accessing the TCRR?
- Where, geographically, are the TCRR users coming from?
- What is the educational profile of the users?
- What are the technical contexts through which people access the TCRR?
- How well does the TCRR technical architecture perform in enabling people to access content?
- What is triggering awareness of and access to the TCRR?
- In what other online and offline contexts do users migrate the TCRR content and why?

The TCRR was developed to make the outputs of the Texas Course Redesign Project (i.e., the redesigned courses) available to the target audience. An important objective of the TCRR was to enable the target audience to easily find high-quality course content to enable reuse and repurposing of the redesigned courses. Users of the TCRR can choose to reuse an entire course or component parts of a course. Faculty members and instructional designers working in public institutions of higher education in Texas are free to use the TCRR content for non-commercial educational purposes. Course instructors may adopt course materials as-is or adapt them according to their own needs and incorporate them into their own materials. For example, they may want to improve an existing course by using and/or repurposing the learning objects associated with a particular TCRR course.

Key questions for evaluation of **use** include:

- What are people attempting to accomplish by interacting with the TCRR?
- What do people expect from the TCRR?
- How are people using the TCRR?
- What are the general patterns of online use and interaction?
- What areas and aspects of the TCRR draw the most and least attention?
- How do people use/reuse the TCRR content offline and outside of the TCRR?
- How effective is the TCRR site and content for users?
- What cultural, academic and technical adaptations do faculty members make to the content?
- How well does the TCRR support users in achieving their goals and completing their scenarios and tasks?
- How useful is the TCRR?

The operational TCRR has the potential to impact Texas institutions of higher education, instructors, and students. To evaluate the impact of the TCRR, one needs to think about the difference it can make. The proposed plan suggests ways in which to identify, understand, and assess potential impacts of the TCRR on key stakeholders, but primarily faculty members, instructional designers, and others. The THECB will likely want to know the extent of changes in knowledge, attitudes, behavior, skills, values, or other attributes in the target audience resulting from using the TCRR and the high-quality educational content from the Texas Course Redesign Project.

Key questions for evaluation of **impact** include:

- What is the impact of the TCRR on individual teachers, instructional designers, and ultimately the learners?
- What is the impact of the TCRR on learning communities?
- What is the impact of the TCRR on the sharing of educational materials?

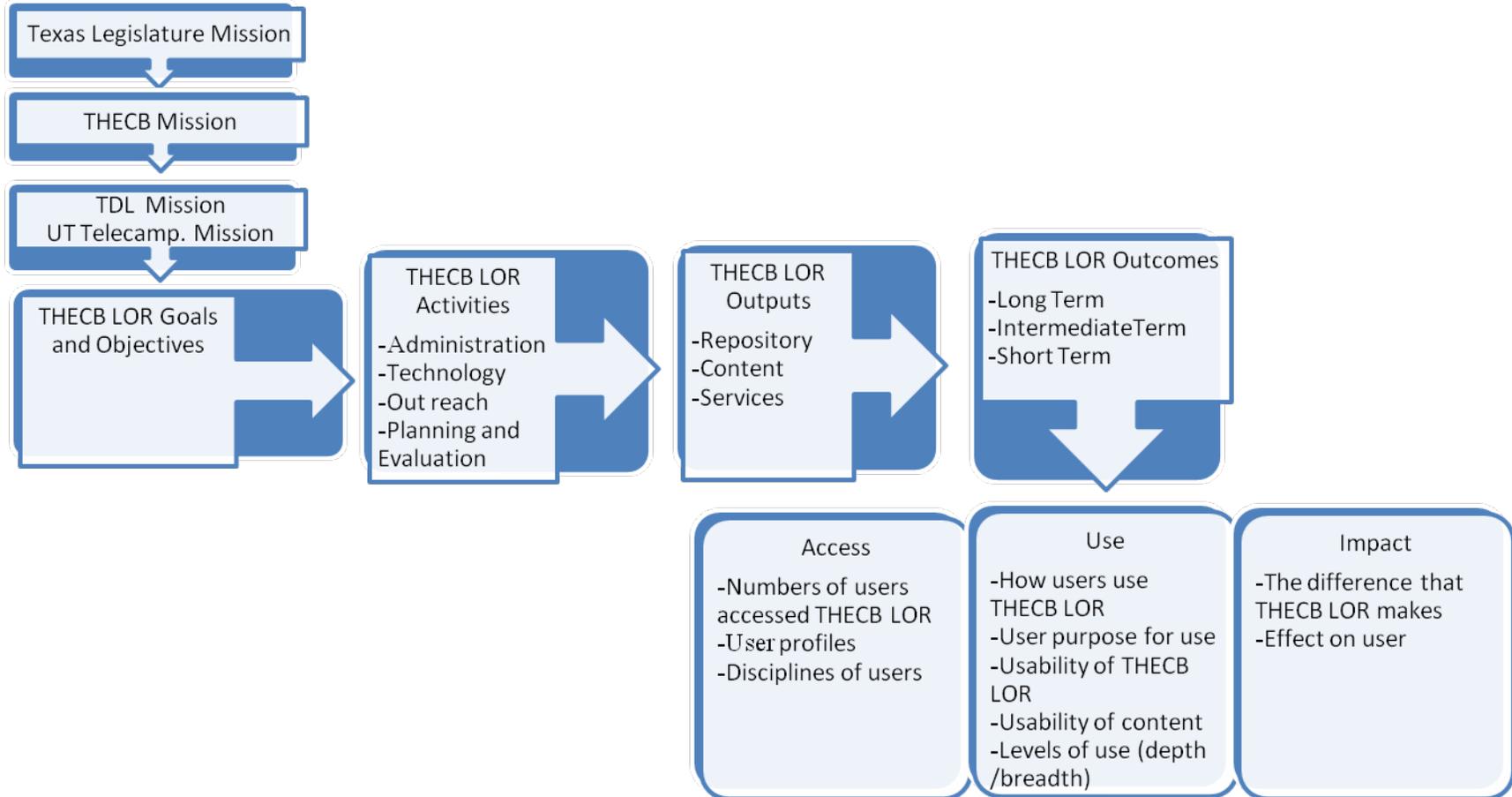
3. The TCRR Evaluation Logic Model

The TCRR Evaluation Logic Model provides the framework for the evaluation plan. The W. K. Kellogg Foundation (2004) and the United Way (1996) relied heavily on a logic model for planning. Logic models allow those planning evaluation to visually depict the flow of a service or program from the inputs, activities, outputs, initial outcomes, intermediate outcomes, and longer term outcomes. We have constructed operational definitions of these defining characteristics of logic models. These operational definitions combine the digital library specific measures outlined by Ryan, McClure & Bertot (2001) with the Kellogg and United Way models. The operational definitions of the components are:

- **Inputs** are resources or barriers that could potentially impact the program or service. They include resources dedicated to or consumed by the program or service such as funding, existing organizations, potential collaborating partners, existing organizational or interpersonal networks, staff and volunteer time, facilities, and equipment and supplies. Besides, inputs can include constraints on the program or service such as attitudes, lack of resources, policies, laws, and regulations. Inputs can also be a capacity measure that describes an ability to use or deliver a networked information service.
- **Activities** are the strategies, processes, tools, techniques, events, technology, and actions of the program or service. They may also include products, services, and infrastructure.
- **Outputs** are the direct results of activities and are usually described in terms of the size or scope of the program or service and products delivered or produced. Outputs can also describe the utilization of the information resources or services. A common approach to evaluating outputs is to measure the extensiveness of a program or service. This is how much of a service has been delivered.
- **Initial outcomes** are specific changes in attitudes, behaviors, knowledge, skills, and status, and levels of functioning, organizational, institutional, societal changes expected from the project. They are necessary steps towards the desired ends, and therefore are important as milestones of participants' progress towards those ends. In addition, initial outcomes can describe the effects of a program or service on some other activity or situation.
- **Intermediate outcomes** link the initial outcomes to the longer term outcomes desired for the participants. They are changes in behavior that result from the participants' new knowledge, attitudes, or skills. They can be explicitly tied to the goals, objectives and planning process of an organization. A good outcome measure provides data that tell an information manager if a specific objective has been met.
- **Longer term outcomes** are the ultimate outcomes a program or service strives to achieve for its participants. They represent meaningful changes for participants, such as improved condition or status, increased capacity, and/or changes in the policy area. These outcomes are the most removed benefits the program or service can reasonably hope to influence.

The TCRR Evaluation Logic Model (see Figure 1) links the goals to the objectives of the TCRR with the indicators that guide the design of the evaluation strategy. The model explains the rationale for choosing the data collection methods. It drives initial hypotheses, and informs the choice of instrumentation. Also, the logic model ties the evaluation back to the THECB educational mission and the TCRR's role in advancing it.

Figure 1: The TCRR Evaluation Logic Model



4. Goals and Objectives of the TCRR

The THECB staff has likely considered the goals and objectives of the TCRR in the larger context of the Texas Course Redesign Project and other initiatives it has undertaken. As the THECB moves to implement an operational TCRR (although now in the context of a statewide learning object repository), it may be appropriate to articulate a set of goals and objectives for the TCRR. These provide the broader framework for an operational TCRR and thus the evaluation plan. The following sections propose goals and objectives for THECB consideration.

4.1. Goals

Goals are typically general statements of intent. They can set targets that may or may not be achievable, and they provide overall direction for action. We propose the following goals that can be associated with the TCRR. These are proposed for THECB consideration.

1. Maximize the impact of the Texas Course Redesign Project on developmental and core course improvement and institutions of higher education in Texas through the TCRR
2. Create a sustainable administrative infrastructure for the TCRR
3. Create an effective, sustainable technology infrastructure for the TCRR
4. Ensure usability of the TCRR and its content (e.g., searchability and accessibility to the disabled) by the target audience
5. Continuously expand the use of the TCRR by the target audience
6. Continuously improve the TCRR in response to user needs, THECB priorities, and evolving technology.

4.2. Objectives

Objectives are more concrete statements than goals, and they are used to guide specific actions. They are not only actionable but also measurable. The following objectives are proposed for consideration; these objectives are tied primarily to goals 1, 4, and 6 above, the goals primarily relevant to this proposed evaluation plan.

1. Design, develop, and implement an evaluation process to assess the impact of the TCRR on faculty members, instructional designers, and institutions of higher education in Texas.
2. Measure access, use, and impact of the TCRR
3. Incorporate the results of all evaluation and feedback into the ongoing planning for the improvement and continued development of TCRR.
4. Ensure usability of the TCRR materials (e.g., searchability and accessibility to the disabled) by its target audience
5. Ensure that the TCRR can be accessed by its target audience.

Another deliverable from our work on the Texas Course Redesign Learning Object Repository Project (Phase II) is a marketing plan. While separate from this evaluation plan, it may be appropriate to identify specific objectives related to disseminating information about and marketing the TCRR. The following are proposed for consideration and these relate to goal 5.

1. Design, develop, and implement a marketing plan
2. Promote the use of the TCRR and its content by the target audience
3. Demonstrate the value of TCRR and its content to the target audience
4. Use the results of ongoing evaluation to build and sustain support for the TCRR initiative.

The articulation of goals and objectives sets the stage for developing the outcomes, indicators, and measures that lay at the heart of an outcome-based evaluation plan.

5. TCRR Outcomes, Indicators, and Measures

The concepts of access, use and impact guided the development of the evaluation plan. These mirror concepts used to evaluate MIT Open Courseware initiative (MIT, 2006). As noted previously, outcomes can be defined in terms of changes to the knowledge, skills, behaviors, and other attributes of the target audience for a program or service. We propose set outcomes for consideration by the THECB. Since outcomes cannot be measured directly, a surrogate measure called indicators is used to assess the extent of movement toward an outcome. Finally, aligned with the type of data needed related to the indicator, we propose data collection methods that can be used. Data collection instruments that will be developed when implementing the evaluation plan should, where appropriate, collect specific information from the target audience to make it possible to differentiate results by educational context, socio-geographic context, and other dimensions.

The outcomes structure attempts to reflect the alignment of evaluation data goals and objectives established for the TCRR by the THECB. The outcomes and indicators have been formulated to focus on elements of the TCRR that are central to its primary purpose, which is to leverage the content of the redesigned courses.

Tables 1, 2, and 3 present the proposed outcomes, indicators, and data collection methods for consideration. Table 1 focuses on the area of **Access**; Table 2 focuses on the area of **Use**; and Table 3 focuses on the area of **Impact**. The following is an example of one row from Table 1. This outcome related to Goal 5: Continuously expand the use of the TCRR by the target audience. This has to do with marketing the TCRR to the target audience. The outcome states a desired change, namely in the awareness of the target audience. The indicator suggests that the desired outcome can be “indicated” by the percentage of the target audience that has accessed the TCRR in a one year period.

On the tables, THECB staff will need to identify the target number or percentage (indicated in **bold red Xs**).

Goal	Outcome	Indicator	Source/Method	When
5	The faculty members at the public institutions of higher education in Texas are aware of the TCRR	X% increase of the number of target audience members that have accessed the TCRR on a yearly basis, starting within one year of its initial release.	Log Analysis	Ongoing data collection compiled annually on the anniversary of official launch of TCRR.

Table 1: Outcomes and Indicators for the Focal Area of Access

Goal	Outcome	Indicator	Source/Method	When
5	Target audience members at the public institutions of higher education in Texas are aware of the TCRR.	X% increase in the number of target audience members that have accessed the TCRR on a yearly basis, starting within one year of its initial release.	Log Analysis	Ongoing data collection compiled annually on the anniversary of official launch of TCRR.
5	Access to the TCRR increases each year.	Total accesses to the TCRR increases by X% annually.	Log analysis	Ongoing data collection compiled annually on the anniversary of official launch of TCRR.
5	Downloads of course materials from the TCRR increases each year.	Total downloads of course materials from the TCRR increases by X% annually.	Log analysis	Ongoing data collection compiled annually on the anniversary of official launch of TCRR.
5	Target audience members establish accounts on the TCRR.	X% increase in user accounts established annually.	User account analysis	Ongoing data collection compiled annually on the anniversary of official launch of TCRR.
5	Target audience members from each discipline for which course content is available in TCRR begin accessing the TCRR within 3, 6, and 12 months after disciplinary content becomes available	X of target audience members from each discipline have accessed the TCRR after new disciplinary course content becomes available.	Online survey to disciplinary faculty members at target institution.	3, 6, and 12 months following release of major new course content in a discipline.
5	Target audience members who teach lower-level undergraduate courses remain the primary user group for the TCRR	The percentage of target audience members who teach lower-level courses remains at least X% of the total TCRR users	Online survey	Ongoing data collection compiled annually on the anniversary of official launch of TCRR.
5	The number of returning users who have user accounts increases each year	The number of returning users increases by X% each year	User account analysis	Ongoing data collection compiled annually on the anniversary of official launch of TCRR.

Table 2: Outcomes and Indicators for the Focal Area of Use

Goal	Outcome	Indicator	Source/Method	When
4, 6	Target audience members find the TCRR interface easy to use and navigate.	X% of target audience report that the interface is easy to use and navigate.	Online survey	Annually on the anniversary of official launch of TCRR.
4, 6	Target audience members successfully find relevant course content in the TCRR.	X% of target audience report that they have found what they were looking for.	Online survey	Annually on the anniversary of official launch of TCRR.
4, 6	Target audience members are satisfied with the file format the course materials are presented in for downloading	X% target audience report that they are satisfied with the file format the course materials are presented in for downloading.	Online survey	Annually on the anniversary of official launch of TCRR.
4, 6	Target audience members are satisfied with the training and help materials provided online by the TCRR.	X% of target audience report that they are satisfied with the training and help materials provided by the TCRR.	Online survey	Annually on the anniversary of official launch of TCRR.
1, 4, 6	Target audience members think that the course content available in the TCRR is useful for course planning and teaching	X% of target audience report that the materials they find are useful for course planning and teaching.	Online survey	Annually on the anniversary of official launch of TCRR.
1, 4, 6	Target audience members have reused the content from the TCRR in their courses.	X% of target audience report that they have reused content from the TCRR in their.	Online survey	Annually on the anniversary of official launch of TCRR.
1, 4, 6	Target audience members use the TCRR for a range of purposes, including planning for a course, preparing to teach a class, enhancing personal knowledge, keeping current in field, and improving the content of their courses.	X% of target audience report that they are using the TCRR for any of the following purposes: planning for a course, preparing to teach a class, enhancing personal knowledge, keeping current in field, and improving the content of their courses.	Online survey	Annually on the anniversary of official launch of TCRR.
1, 4, 6	Target audience members will consider adopting content from the TCRR for their courses in the future	X% of target audience members will consider adopting content from the TCRR for their courses in the future	Online survey	Annually on the anniversary of official launch of TCRR.
1, 4, 6	Target audience members are satisfied with the breadth & depth of content in the TCRR	X% of target audience members report that they are satisfied with the disciplinary coverage of the TCRR content and the	Online survey	Annually on the anniversary of official launch of

Goal	Outcome	Indicator	Source/Method	When
		quantity of learning objects in each discipline		TCRR.
4, 6	Target audience members are satisfied with the quality of content in the TCRR	X% of target audience members report they are satisfied with the quality of content in the TCRR	Online survey	Annually on the anniversary of official launch of TCRR.
1, 4, 6	Target audience members think that the learning objects provided by the TCRR fit their course curriculum	X% of target audience members report that the learning objects provided by the TCRR fit their course curriculum	Online survey	Annually on the anniversary of official launch of TCRR.
1, 4, 6	Target audience members have downloaded content from the TCRR for course planning and use	X% of target audience members report that they have downloaded content from the TCRR for course planning and use	Online survey	Annually on the anniversary of official launch of TCRR.
4, 6	Target audience members think that the metadata provided for learning objects help them to find and select appropriate content	X% of target audience members report that the metadata provided for learning objects help them to find and select appropriate content	Online survey	Annually on the anniversary of official launch of TCRR.

Table 3: Outcomes and Indicators for the Focal Area of Impact

Goal	Outcome	Indicator	Source/Method	When
1	The TCRR has a significant impact on course planning at the institutions of higher education in the state of Texas	X% of target audience members report that the TCRR has a significant impact on course planning in terms of saving time, reducing cost, and saving efforts	Online survey	Annually on the anniversary of official launch of TCRR.
1	The TCRR has a significant impact on enhancing target audience members' knowledge of their fields	X% of target audience members report that the TCRR has a significant impact on enhancing their knowledge of their fields	Online survey	Annually on the anniversary of official launch of TCRR.
1	The TCRR has a significant impact on learning outcomes	X% of target audience members report that the TCRR has a significant impact on learning outcomes	Online survey	Annually on the anniversary of official launch of TCRR.
1, 6	Target audience members are more successful locating learning objects for their courses with the TCRR than with their previously used sources.	X% of target audience members report that they have been more successful locating learning objects for their courses with the THECB LOR than with their previously used sources	Online survey	Annually on the anniversary of official launch of TCRR.
1, 6	The TCRR has a significant impact on the efficiency of course planning	X% of target audience members report that they have saved time for course planning by using the TCRR	Online survey	Annually on the anniversary of official launch of TCRR.

6. Data Collection Methods

This section of the evaluation plan discusses some possible data collection methods for use in the evaluation. We recommend that the evaluation employ both quantitative and qualitative methods. The methods described below can be used to collect data for evaluating the TCRR.

- **Log file analysis** is the process of automatically creating and maintaining log files that contain information about activities performed by the server. These files also track information about the users such as when, how, and by whom the server is visited (Bertot, McClure, & Ryan, 2001). There are a number of software packages that can be used to analyze a log file and create reports of usage data (Rubin, 2001). Since the system allows users to register, analyzing by user accounts is possible. A **User account analysis** is the process of analyzing and generating data about user activities such as signing up for a new account, demographic information about the users, user access, etc.
- **Online pop-up surveys** are administered as part of online services, and participants are recruited online. The pop-up methodology allows the random selection of users. This makes it an appropriate methodology for evaluating issues such as user satisfaction with websites and services (Comley, 2000). Moreover, this approach has the advantage of automatically processing and coding data into structured files (McClure, 2002).
- **Online and/or print-based surveys** are administered online or via mail or distributed at professional meetings where the target audience is present. While the pop-up survey can ask a few questions, a more formal survey can be more comprehensive in scope. The online version allows for automatic processing and coding of data into structured files. Print-based surveys require additional processing and coding before data analysis can be performed (McClure, 2002).

Based on our experience, qualitative methods can provide richer data than typical quantitative methods. The following two methods allow for deeper understanding of user responses and ideas related to a service or program. Tables 1, 2, and 3 did not list the following two methods, but these could easily be used to address the indicators listed in those tables.

- **Focus group** is a group of interacting individuals having some common interest or characteristics who are brought together by a moderator. The moderator uses the interaction between the group's members to gain in-depth information about a specific issue (W.K. Kellogg Foundation, 1998)
- **Interviews** are usually one-on-one interactions between an evaluation team member and a member of a user group who may have important information for the evaluation effort. Participants are chosen because of their particular vantage point or because they have provided valuable information in one of the other information gathering techniques and the evaluation team would like follow up details.

These methods are either user-centered (surveys, focus groups, and interviews) or performed without user participation (log file analysis and user account analysis). These data collection methods are illustrative. Before choosing a particular method, the evaluation team has to consider time and budgetary constraints on the project. Some of these methods may be useful but not cost effective.

7. Conclusion

Learning object repositories are relatively new in their implementations. The Texas Course Redesign Repository (TCRR) is unlike most other LORs in that it is attempting to make available full or partial courses, where the learning objects are related to one another in the context of a single course. The

implementation of a new service or program requires effective evaluation activities to ensure that the service or program can be continuously improved.

This document presents an outcome-based evaluation plan that can be implemented once the TCRR becomes operational. It is not intended as a prescription for an evaluation plan, but rather outlines and describes an approach the THECB can consider for evaluating the system. The focus of the evaluation is primarily on the system itself and only minimally the quality of the course materials which are products of the broader Texas Course Redesign Project. We also recommend that evaluation be ongoing once the TCRR is officially launched to ensure that the TCRR continues to move toward achieving the goals and objectives the THECB has determined for the TCRR.

The proposed plan identifies a set of desired outcomes the TCRR seeks to produce in three areas: access, use, and impact. The project team also suggests the indicator(s) and data collection method(s) to be used to measure each outcome. This document can serve as a blueprint for further development of a more detailed evaluation plan prior to its implementation.

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