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IDEA Model from Theory to Practice: Integrating Information Literacy in Academic Courses

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ABSTRACT

IDEA (interview, design, embed, and assess) is a theoretical instructional design model for integrating information literacy (IL) in academic courses. The model supports the Association of College and Research Libraries (ACRL) proposed 2015 Framework for Information Literacy for Higher Education through the collaborative efforts between librarians and teaching faculty. The article describes a case study application of information literacy content integrated into three Doctor of Education blended classes taught by the same classroom instructor. The theoretical phases are explained in terms of practical steps and outcomes resulting in pedagogically sound curriculum and effective collaboration between librarian and teaching faculty.

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INTRODUCTION

The IDEA model is a step-by-step curriculum design process for integrating information literacy in academic courses. The model supports the Association of College and Research Libraries (ACRL) proposed 2015 Framework for Information Literacy for Higher Education through the collaborative efforts between librarians and teaching faculty in order to "create a new cohesive curriculum for information literacy". The author created the model after a review of the literature indicated no existing systematic approach to working collaboratively with faculty to integrate information literacy in academic courses. It became evident that a library-specific instructional design model would be more efficient in streamlining the process, increase the pool of librarians not formally trained in instructional design, and meet the demands of collaboratively designing cohesive curricula. This paper describes in detail how the model was used in a pilot case study to design a Doctor of Education blended course consisting of nine face-to-face classes and five asynchronous online classes. The use of case studies are "proven particularly useful for studying educational innovations, evaluating programs, and informing policy" and gathering data regarding the effectiveness of new theoretical models (Merriam & Merriam, 1998).

LITERATURE REVIEW

The systematic approach to designing instruction began with the United States Military during World War II. The approach became formally known as Instructional Systems Design (ISD) during the 1950s. Although ISD was used primarily for the development of on-the-job training, the field of educational psychology recognized that the systematic instructional design approach to curriculum development was pedagogically logical and cost effective (Gagné, Briggs, & Wagner, 1992). ISD is now more practically referred to as the ADDIE model based upon its phases of analysis, design, development, implementation, and evaluation. Numerous derivatives of the ADDIE model evolved, including Mager's criterion referenced instruction (CRI) framework (1975), Dick and Carey's *The Systematic Design of Instruction* (1978), and Gagne's *Conditions of Learning* (1985). The transition from a systematic approach for developing on-the-job training to educational pedagogy occurred with the widespread adoption of Wiggins and McTighe's *Understanding by Design* (1998). The "backward design approach" to lesson planning is counter intuitive to traditional curriculum design because it begins by identifying instructional outcomes before developing performance-based assessments and finally classroom instruction and lesson planning.

A review of the literature indicates the increasing use of the ADDIE model in higher education library instruction. Campbell (2014) discussed the application of the ADDIE model in order to analyze and identify new technologies for use in library instruction. Easter, Bailey, and Klages (2014) and Summey and Valenti (2013) describe how the model was used in distance learning environments to support the research needs of online students. Reinbold (2013) reported success using the ADDIE model to redesign programmatic information literacy instruction for first year medical students. Also in 2013, Davis discussed using the model to develop one-shot library sessions for journalism students.

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While Booth (2011) introduced a formal instructional design model for developing "one-shot" and programmatic information literacy instruction, a review of the literature found no evidence of a library-specific instructional design model for working collaboratively with content instructors to integrate information literacy in academic courses.

The IDEA model has foundations in both behavioral and cognitive learning theories. Similar to traditional ISD approaches, the model incorporates behavioral theory through its emphasis on observable performance objectives and assessments representative of Bloom's Taxonomy (1956). The model also includes aspects of cognitive psychology, specifically Sweller's (1988) Cognitive Load Theory (CLT). CLT is an information processing theory that considers the effect of the working and long-term memory on meaningful learning. The working memory is a mental construct that temporarily holds limited amounts of raw data. Long-term memory manages cognitive structures called schemas that permanently store unlimited amounts of meaningful information. According to CLT, an overload of information in the working memory, through complexity or amount of data, negatively impacts learning. Empirical studies indicate that instructional design interventions can positively affect the efficiency of the working memory particularly when learning complex tasks (Paas, Renkl, & Sweller, 2003). In addition, instructional design that considers students' prerequisite abilities and backgrounds improve long-term, meaningful learning. It is important to note that instructional strategies that are helpful for novice learners may have no or even negative effects on advanced learners, referred to as the expertise reversal effect (Kalyuga, Ayres, Chandler, & Sweller, 2003). Effective instructional design strategies include presenting clear and concise content, "chunking" information into logical and concise amounts, logically sequencing information, limiting redundancy, and providing a distinct focus on critical learning tasks.

BACKGROUND

The instructor assigned to teach the blended Doctoral course initiated the collaborative effort with the librarian two months prior to the course. It was the first time the instructor was teaching the course, as well as, delivering an online blended class using the Blackboard course management system (CMS). The instructor expressed frustration with teaching previous courses that had significant research requirements, particularly the amount of instructor time dedicated to research activities and assignments and not having sufficient time to focus on the course content. The instructor hoped that a collaborative design effort with the librarian would alleviate these challenges. The first course was delivered in the Spring 2014 semester.

After the course, the librarian implemented and analyzed multiple qualitative assessments to measure the effectiveness of the information literacy and library resources, instruction, and support. Based on the assessment results, the librarian reiteratively applied some steps in the model to improve upon the course design. The instructor and librarian again made modifications to the course. The same instructor taught two of the revised classes the following spring of 2015. After the courses, the assessments were again implemented. The librarian re-analyzed the assessments and compared the effectiveness of the redesigned course to the original results.

THE IDEA MODEL

The IDEA model (Mullins, 2014) is based upon instructional design best practices and has foundations in behavioral and cognitive learning theories, with emphasis on Cognitive Load Theory (CLT). According to Sweller's (1988) Cognitive Load Theory, instructional design strategies that minimize an overload of information in the working memory reduce learning disruption and improve long-term and meaningful learning. The model includes four steps, each associated with forms, rubrics, and checklists as outlined by Mullins (2014).

1. Interview: collect broad data about the student profiles, learning constraints, course, and information literacy content through a syllabus analysis and instructor interview.

2. Design: identify information literacy goals, objectives, assessment items, and content using a backward-design approach.

3. Embed: embed the information literacy content using effective strategies that minimize learning disruption.

4. Assess: assess the course effectiveness and modify the course content at the class, departmental, institutional, regional, and national standards including Association of American Colleges and Universities (AAC&U) and Association of College and Research Libraries (ACRL).

CASE STUDY DESIGN

INTERVIEW PHASE

During the interview phase, the librarian collects broad data about the course's learning environment, the students, and the course research requirements. Significant input by the instructor helps validate the data. Fig. 1 illustrates the case study's interview phase from theory to practice and results as discussed in detail below.

STEP 1: PERFORM A SYLLABUS ANALYSIS

The librarian analyzed the syllabus for research-related tasks and assignments, information literacy opportunities, potential library sources that may be utilized as course content, and general course logistics (i.e., class dates and times). Library related terms, skills, and content were highlighted and potential questions or comments were directly annotated on the syllabus.

The librarian identified a number of course elements that the library could potentially support through instruction and resources. First, the primary course assignment was a 20-page research paper about a contemporary topic in literacy education. The paper required a minimum of 20 varied resources written within the last five years. The assignment required students to write an effective hypothesis statement, perform a comprehensive literature review, avoid plagiarism, and correctly use the American Psychological Association (APA) style.

A second course element that the library could potentially support was access to resources suggested as course content that were not classified as required textbooks. The Library does not, as a rule, purchase textbooks as these are expenditures expected of students. The librarian investigated whether the resources were available through the library's digital collection so that persistent links may be embedded within the Blackboard CMS. Embedding direct links to resources, particularly at the "point of need" within a course, helps minimize disruption and increases learning continuity. If the source was available, the librarian verified the number of simultaneous user-licenses so that more than one student could use the resource at a time. Also, the librarian verified any licensing restrictions regarding use within a "distance-learning" course. Although Harvard Business Review Notice of Use Restrictions was the only known publication that mandated licensees "not host this content on learning management systems or use persistent linking or other means to incorporate the content into learning management system" it was standard practice by the librarian to verify licensing restrictions for all sources. If the source was unavailable through the digital collection, the librarian sought acquisition of the material. The library's informal practice gave high priority to the acquisition of materials recommended for courses with the exception of textbooks.

A third course element that the library could offer was reference services to meet both distance learning and in-person research needs. Synchronous virtual services for real-time support include Skype-by-appointment, chat, and telephone support. Asynchronous virtual services for support that did not require immediate attention included text and email. The librarian also noted that students that preferred in
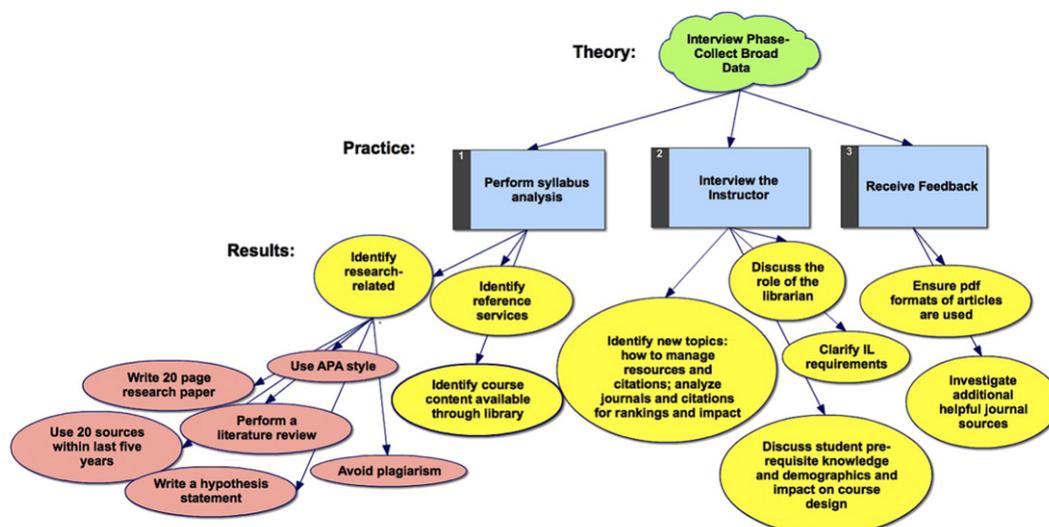
Fig. 1. Interview phase theory to practice and results.

person interactions could utilize in-person research-by-appointment, research workshops, and drop-in reference desk options.

STEP 2: INTERVIEW THE INSTRUCTOR AND RECORD THE RESULTS ON THE INTERVIEW FORM

The syllabus analysis became the "conversation starter" during a follow-up interview with the instructor. During the interview, the librarian sought to clarify the IL requirements and probed the instructor for relevant information. The instructor confirmed instructional topics identified by the librarian (i.e., database searching and APA citation). In addition, the instructor requested additional topics to cover in the instruction including how to effectively manage resources and citations and how to analyze journals and citations for rankings and impact factors.

During the interview, the librarian and instructor discussed the students' pre-requisite knowledge and demographics at length. Based upon the instructor's knowledge of the cohort and students enrolled within the program as well as discussions with previous instructors, it was surmised that the potential learners reflected national Ed. D. student trends in that many were older, more experienced, employed full-time, and entering the program mid-career for personal growth or career advancement (Biddle, 2013). Few students within the program fit the traditional student profile as full-time students enrolled as postgraduates. Based upon these circumstances the instructor reinforced that library support may be necessary during evenings and weekends. It was also likely that students would have varied levels of research skills due to the return to school of some students after gap years, previous fieldwork experience, and that some international students did not receive a master's degree from a U.S. institution. As a result, the librarian noted that varied levels of support might be necessary to meet both advanced and remedial research needs.

Both the instructor and librarian discussed the role of the librarian and agreed that an ongoing and "dedicated librarian" role beyond the "one shot instruction" would contribute to greater student success. The librarian recommended an embedded role within the Blackboard CMS in order to monitor research tasks and facilitate learning about related information literacy skills. It was suggested that the embedded role might include the facilitation of a dedicated research discussion board and direct student communication via email or announcements.

STEP 3: RECEIVE INSTRUCTOR FEEDBACK AND REVISE

The librarian sent the results of the syllabus analysis and interview to the instructor for final review and feedback. The instructor's feedback included a request that the librarian investigate other educational literacy journals available through the library collection and reinforce that students utilize portable document formats (pdfs), not web-based articles, due to their visual readability.

DESIGN PHASE

During the design phase the data collected during the interview phase was analyzed in order to define the information literacy goals, objectives and content. The design phase focuses on purposeful curriculum planning. Fig. 2 illustrates the case study's design phase from theory to practice and results as discussed in detail below.

STEP 1: PERFORM A GAP ANALYSIS

In general terms, a gap analysis defines the difference between a current and desired state. An instructional gap analysis identifies the skills and knowledge a student needs to successfully complete a course. Within the context of the model, the instructional gap was identified by the answer to the following questions:

1) What is the level of student IL knowledge and research skills before entering the course (Novice, Intermediate, or Advanced)?
2) What is the level of student IL knowledge and research skills required to successfully complete the course (Low, Medium, or High)?

In response to question one, the librarian and instructor rated students as having an intermediate to advanced level of IL knowledge and research skills upon entering the course. This rating was based upon student profiles and knowledge about the cohort. In response to question two, the librarian and instructor rated the level of student IL knowledge and research skills required to successfully complete the course as high. This rating was based upon the complexity and quality of research skills required to complete the main assignment which included the application of advanced search limiters, tracking the
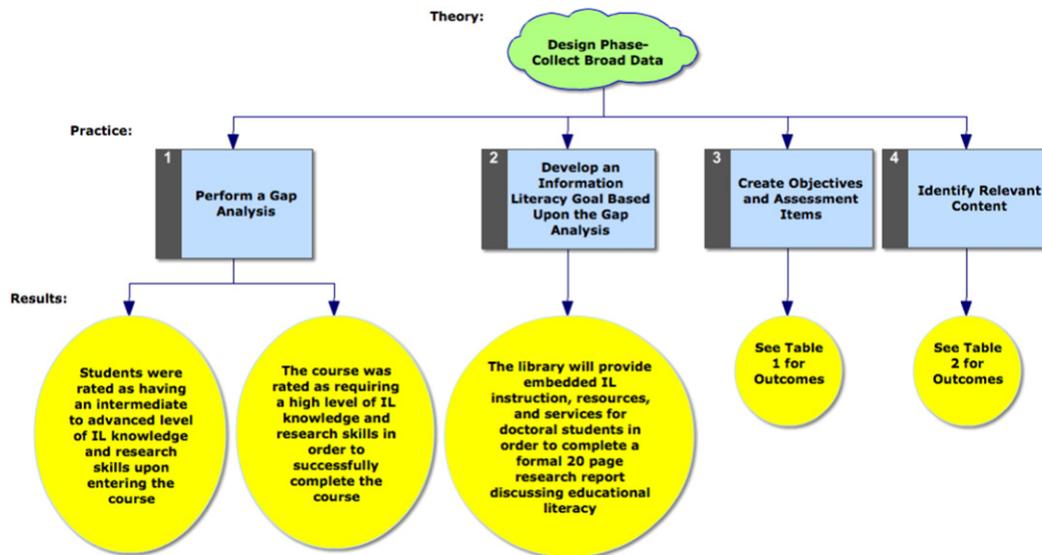
Fig. 2. Design phase from theory to practice and results.

research impact of authors and journals, and effective resource management.

STEP 2: DEVELOP AN INFORMATION LITERACY GOAL

An information literacy goal statement was developed based upon the gap analysis. An instructional goal is a broad statement that describes what the learners are expected to perform or show behavioral evidence of at the end of the instruction. In the context of the IDEA model, the goal statement includes the general level of library support, the intended audience, and overall information literacy activity. The librarian defined the goal statement as follows: the library will provide embedded IL instruction, resources, and services for doctoral students in order to complete a formal 20 page research report discussing contemporary, seminal works on a topic related to educational literacy.

STEP 3: CREATE INFORMATION LITERACY OBJECTIVES AND IDENTIFY ASSESSMENT ITEMS

Information literacy objectives are statements that represent enabling tasks or steps necessary to achieve the overall goal. The librarian used the backward-design approach by creating assessment items in parallel with each literacy objective. Although the librarian may not actually be grading the assessment item it is a useful indicator for the course instructor that the objectives are being successfully met.

Table 1
Objective and assessment items.

Objective	Assessment item
Identify a contemporary educational literacy topic based upon seminal works within the field	Thesis statement
Locate a minimum of 20 resources of which 15 are scholarly, peer-reviewed journal articles within the last five years	Annotated bibliography
Write a research paper in accordance with APA style guidelines by analyzing, organizing, and interpreting information within the context of assignment	Final research paper
Use information resources ethically	Turn-it in report

Table 1 displays the objectives and assessment items created for the course.

STEP 4: IDENTIFY RELEVANT INFORMATION LITERACY CONTENT

During the final step of the design phase, the librarian identified the relevant learning objects, instructional activities, and resources that support each learning objective. The content was chosen from either internal library resources (ILR) or open education resources (OER). In addition to YouTube and Creative Commons licensed works, the author also searched dedicated OER repositories including Jorum, Multimedia Educational Resource for Learning and Online Teaching (MERLOT), massive open online courses (or MOOCs), Peer-Reviewed Instructional Materials Online (PRIMO), and Cardiff University's Information Literacy Resource Bank (ILRB). If relevant content was not found from existing resources it was labeled as TBD or "to be developed/determined" as a flag that the additional content must be developed or identified. Finally, the librarian identified the supporting tools and resources that are essential applications for student achievement of the objective but may not be pedagogical objects. Appendix **A** lists the information literacy content identified for the course based upon the learning objective.

Both the instructor and librarian agreed that the learning resources, activities, and instruction might require modification during the course based upon formative assessments. Formative assessments, discussed in greater detail during the final phase of the model, evaluate student performance and progress during the course, resulting in ad hoc modifications to course activities and materials.

EMBED PHASE

The embed phase identified strategies for the logical integration of information literacy content and learning activities within course curriculum. Because the librarian and instructor inferred that students were entering the course with intermediate to advanced levels of research and IL skills, referred to by CLT as activated schemas (Sweller, 1988), embed strategies were employed to minimize inefficient cognition on non-critical learning tasks that impede meaningful learning of advanced students, referred to as the expertise reversal effect. Fig. 3 illustrates the
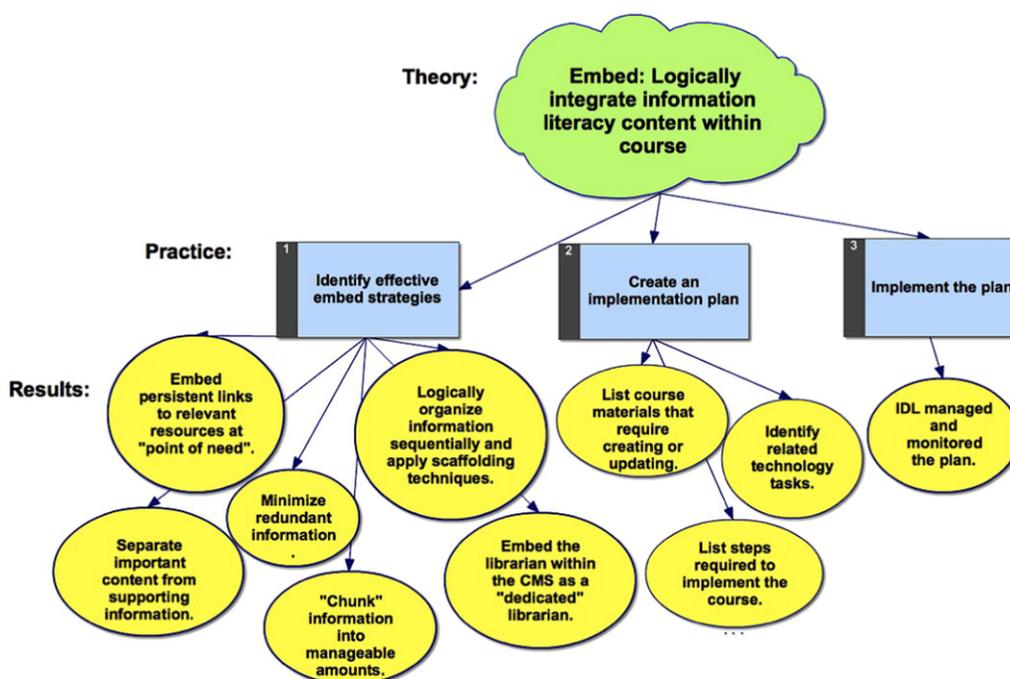
Fig. 3. Embed phase from theory to practice and results.

case study's embed phase from theory to practice and results as discussed in detail below.

STEP 1: IDENTIFY EFFECTIVE EMBED STRATEGIES

The librarian identified an effective embed strategy that would include direct access to the learning objects, instructional activities, tools, and resources at the "point of need". Persistent links to relevant resources, including the digital library collection (i.e., e-books, online articles, streaming video, and databases), Internet resources (i.e., OER resources), and web-based library resources (i.e., course library guide, library homepage, reference services webpage), were embedded directly in the CMS when referenced in the course curriculum. This strategy reduced the risk of students being driven off-task to search for resources, as well as, decreased the cognitive effort needed to employ search strategies, thus, increasing learning continuity and time dedicated to using the resources rather than searching for the resources.

Another embed strategy implemented by the librarian was to separate important course content and resources from supporting information, as well as, minimize redundant information. This strategy focused student attention on critical learning tasks and again moderated the cognitive efforts used to attend to non-critical tasks and information. Topics identified as non-critical yet supporting included technical support resources, directions for remotely accessing digital library resources (i.e., online articles, databases, streaming video), general library information (i.e., hours, departments, contact information), reference support services (chat, email, research by appointment), and assumed remedial topics (i.e., What is the difference between popular, peer review, and trade publications? What is plagiarism?). The non-critical and supporting information was aggregated in a course library guide and easily accessible through a direct link under a menu heading labeled Research Support.

Additional embed strategies implemented by the librarian included "chunking" or logically organizing information sequentially, as well as, scaffolding the content from simple to complex research tasks within the context of the course curriculum. For example, simpler and beginner level topics (i.e., choosing a topic, creating a thesis statement, and performing a literature review) were introduced at the beginning of the course schedule, followed by the natural progression of the next level of research and writing tasks (i.e., effectively searching for articles using limiters), culminating in higher-order cognitive tasks (i.e., synthesizing a new idea and writing the comprehensive paper).

Finally, a critical strategy agreed upon by both the instructor and librarian was that of embedding a "dedicated" librarian within the course who would take an active role in monitoring information literacy and research skills. The librarian was added as a co-instructor within the course CMS. This allowed the librarian to view, edit, and add course content, as well as, communicate directly with students via email or announcements. Announcements included notification of a library sponsored citation workshop, changes to course research and library-related materials, and important tips regarding upcoming research assignments. In addition, the librarian created and monitored a discussion area title Research Q&A for posting research questions. The librarian monitored these questions and provided timely feedback. The syllabus was updated to explicitly define the roles of the instructor and the librarian so as not to confuse the students. It was explained that the instructor was described as the primary facilitator of the course and all questions regarding the course requirements, assessments, and reading literacy subject domain must be directed to the instructor. The librarian played a supporting role in the course and was dedicated to questions and content related to research and the library. The syllabus also included the librarian's contact information outside of the CMS including email, telephone number, and location.

STEP 2: CREATE AN IMPLEMENTATION PLAN

During this step, the librarian created a list of tasks and responsible parties necessary to deliver the course on time. The list included the course materials that required creating or updating. It was determined that the librarian needed to develop a course specific library guide, make slight modification to the screencast tutorial on effective database
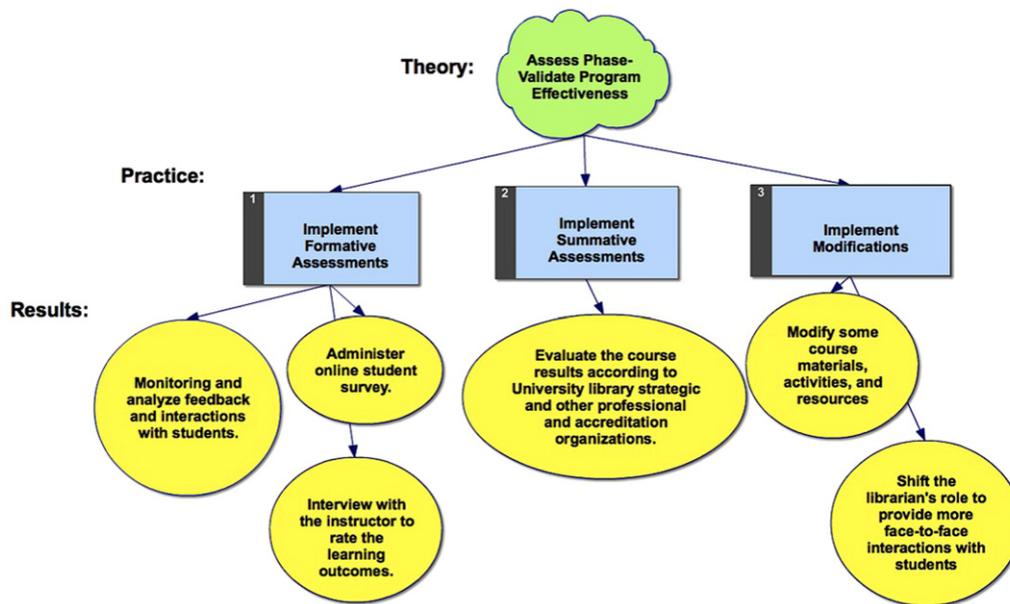
Fig. 4. Assess phase theory to practice and results.

search strategies due to platform changes, and develop a lesson plan for a virtual library class using the GoToMeeting application. The course instructor needed to modify the syllabus and course calendar. In addition, the plan identified the technology tasks required to implement the course. As per the University policy, the course instructor was required to contact information technology to request that the librarian have co-instructor access to the course CMS. The librarian worked with the instructor to embed the direct links to resources, create a submenu option titled Research Support and embed the course library guide, and set up a discussion board for research-based questions.

STEP 3: IMPLEMENT THE PLAN

The librarian took primary responsibility to ensure the implementation plan was successfully completed. This included maintaining communication between all necessary parties including library administrative assistants, information technology, and the instructor. The task also required periodic validation that tasks were successfully complete and in the end that the course was fully ready for delivery.

ASSESS PHASE

The purpose of the assess phase is to analyze the course outcomes in order to validate student learning and overall program effectiveness. Formative and summative assessment results were used to modify the course design as well as guide future information literacy integration efforts. Fig. 4 illustrates the case study's assess phase from theory to practice and results as discussed in detail below.

STEP 1: IMPLEMENT FORMATIVE ASSESSMENTS

The librarian used formative assessments to modify and improve the course content. Although formative assessments are discussed here as a separate step at the culmination of the course, they were also used throughout the course to make ad hoc improvements. The pedagogical design cycle of "implement, evaluate, and adjust" is a student-centered approach to instructional design and is considered critical to learning success, especially in a pilot course such as the case study presented in this paper.

Formative assessments implemented during the course included monitoring feedback and questions from students, online and in-class course discussions, course assignment grades, and the content of student–librarian interactions. Based upon these informal assessments, the instructor and librarian maintained a consistent and open dialog about necessary modifications. The librarian added additional resources to the library guide including information about using the Scopus database, recommendations for additional journal titles, and directions for using citation management tools including Zotero, and subscription-based Easybib. In addition, the librarian helped facilitate a voluntary hands-on workshop on the APA citation style, and communicated important tips based upon commonly asked questions using the CMS announcement feature.

Formative assessments were also implemented at the end of the course. The assessments included an informal interview with the instructor to rate the learning outcomes according to the predefined objectives (see Appendix B) and the analysis of an online student survey (see Appendix C). The librarian also performed a frequency count of research concepts that reflected the questions posed to the librarian through emails, the research discussion boards, and one-on-one research help appointments. The common research questions included how to use advanced database search strategies (i.e., filtering for meta-analysis articles only); how to use citation and abstract databases to find related, contributing, and cited by articles; locating articles based upon citation only; and suggestions for narrowing or expanding research topics to meet the proper scope of the assignment.

STEP 2: IMPLEMENT SUMMATIVE ASSESSMENTS

The librarian used summative assessments to make an end-point judgment of the overall course effectiveness in the context of a more global information literacy standard. The same tools used to implement the formative assessment were used during this step, however, the criteria by which the assessments were measured was different. Specifically, the librarian used the summative assessments to evaluate the course according to the University library strategic plan, referred to as the five-year roadmap. The roadmap is comprised of library goals, objectives, and action plans that inclusively reflect the University strategic plan, Middle States regional accreditation guidelines, New York State

Distance Education guidelines, and Association of American Colleges and Universities (AAC&U) and Association of College and Research Libraries (ACRL) national standards. Specifically, the librarian concluded that the use of the model to design the course met the following encompassing strategies:

- Improve existing methods and explore new pedagogical approaches to the Libraries' instructional efforts.
- Expand curriculum-integrated instruction.
- Investigate new ways for the LIU Libraries to participate in the University's distance learning initiatives, including the creation of additional online resources.
- Provide more support for developing librarians as instructors to teach in both face-to-face and virtual environments.
- Meet the research needs of online students.

STEP 3: IMPLEMENT MODIFICATION PLANS

Based on the assessment results, the librarian reapplied some steps of the model to improve upon the course design. Course goals and objectives were not modified. Modifications made to the course materials and activities included changes to the information literacy resources and a shift in the librarian's embedded role to a greater face-to-face presence including a dedicated library classroom session. Specifically, the librarian added the following resources and activities:

- A playlist of recommended streaming videos available through YouTube and the Library's digital collection
- Pathfinder of websites that discuss current literacy topics
- A video screencast tutorial describing how to identify a database based upon a journal A–Z search
- A student survey to gather information about what questions or topics students would like covered during face-to-face library instruction. Appendix D displays an example of the student survey implemented in preparation for the face-to-face library instruction.

REASSESSMENT

The same instructor taught the revised course two additional times in the following 2015 spring semester. After the delivery of the revised course, the librarian again implemented formative and summative assessments used during the first implementation of the course in Spring 2014. The assessments included an informal interview with the instructor to rate the learning outcomes according to the predefined objectives and the analysis of an online student survey. The librarian compared the assessment results to the original results. Relevant findings included:

- No change in the rating of learning outcomes by the instructor during the informal interview. The predefined objectives for all classes were rated as Exemplary — IL objective is clearly met through assessment.
- 20% increase in student satisfaction with the librarian's support during the course
- 30% decrease rating by students of the library guide resources as quite useful or very useful
- 14% decrease rating by students of online database or journal links as quite useful or very useful
- 42% decrease rating in online APA citation resources as quite useful or very useful

The decreased rating of online resources was attributed to the face-to-face library instruction session and reinforcement by the instructor to utilize library reference service and in-person research appointments. Anecdotal feedback from the instructor during an informal follow-up interview, indicated a significant increase in time dedicated to course content and a decrease in time dedicated to teaching and monitoring research tasks and activities, as well as an improvement in work quality and grades among the students.

LIMITATIONS

Recognizing the limitations of the case study is important for future application of the model within the author's University and external institutions. First the case study sample sizes, limited to the enrollment of students in the same doctoral course, were cohorts of 9, 8, and 7 students. These limited sample sizes, albeit a start, make it difficult to generalize learning outcomes to other educational settings. It is also important to recognize the inherent difficulties of assessing information literacy learning outcomes especially when integrated within courses taught by other instructors. An obstacle for instructional librarians, even those with active embedded roles, is their peripheral role within learning environments including limited access to scores, student artifacts, and day-to-day classroom interactions which impedes their first-hand knowledge and effectiveness as curriculum designers and instructors.

CONCLUSION

A number of rational assumptions regarding the application of the IDEA model within the case study narrative can be made. First, although academic institutions are responding to student demands for flexible learning environments, in particular distance-learning education, students continue to value the importance of face-to-face instruction and interactions. Next, an organized, systematic, and collaborative approach to embedding information literacy within academic courses results in an efficient and effective pedagogical approach to curriculum design. However, because the application of the model in its entirety is time consuming, the return on investment is greatest when the model is applied to courses that:

- have significant research requirements
- are frequently implemented
- include motivated faculty
- have reasonable development timeframes
- may be applied to other closely related courses
- have reasonable class sizes
- have minimal face-to-face seat time and require greater virtual support.

Finally, it is worth investigating the perceived trends that higher education librarians' niche within the academic landscape is morphing from managers of recorded information and emerging into instructional partners, teaching peers, collaborative faculty, and information literacy specialists. The author plans to further investigate the application of the model using different assessment methodologies, educational environments, and content areas.

ACKNOWLEDGEMENTS

APPENDIX A

IDEA case study: information literacy content.

Objective	IL learning objects & instructional activities	Supporting tools & resources
Identify a contemporary educational literacy topic based upon seminal works within the field	Thesis Writing Libguide (ILR) Ebook: A Manual for Writers of Research Papers, Theses, and Dissertations (ILR) Purdue University OWL Thesis Writing (OER) Kanopy Streaming Video Literacy Topics (ILR)	Online Thesis Generator (web & Mobile App)
Locate a minimum of 20 resources of which 15 are scholarly, peer-reviewed journal articles within the last five years	Asynchronous Screencast tutorial on effective database search strategies (ILR) Self-Paced Tutorial (Primodb.org): Finding Resources for Your Literature Review: Leaving No Stone Unturned (OER) Synchronous Online Adobe Connect Session (TBD)	Databases: • EBSCOHost: Educational Research & ERIC (Mobile App) • SAGE Educational • ProQuest Edu • SciVerse Scopus (Mobile) Additional resources: • Google Scholar • Browzine Mobile App • Easybib Subscription (Web & Mobile App)
Write a research paper in accordance with APA style guidelines by analyzing, organizing, and interpreting information within the context of assignment	Ebook: Patterns for college writing (ILR) DUKE University English Composition MOOC (OER) MERLOT APA Tutorial and Reference Tool (OER) Ebook: APA style guide to electronic references (ILR) APA Video Tutorial (OER)	APA MS Word Template
Use information resources ethically	Cardiff ILRB on Plagiarism (OER)	Blackboard's SafeAssign

APPENDIX B

Objective assessment rubric.

Objective	Developing IL objective is not clearly met through assessment.	Competent IL objective is somewhat met through assessment.	Exemplary IL objective is clearly met through assessment.
Identify a contemporary educational literacy topic based upon seminal works within the field			X
Locate a minimum of 20 resources of which 15 are scholarly, peer-reviewed journal articles within the last five years			X
Write a research paper in accordance with APA style guidelines by analyzing, organizing, and interpreting information within the context of assignment			X
Use information resources ethically			X

APPENDIX C

Student survey results.

EDD 1105 library and research support survey results			
1. During the course, did you use the course library guide (EDD 1105 Libguide) for research support?			
Answer options	Response percent		
Yes	80.0%		
No	20.0%		
2. Why did you not use the EDD 1105 Libguide?			
Answer options	Response percent		
I did not know it existed.	0.0%		
I did not find the information useful.	0.0%		
I could not access it.	100.0%		
Other (please specify)	0.0%		
3. Why did you not find the information useful?			
Answer options	Response percent 0		
4. What problems did you have accessing the Libguide?			
Answer options	Response percent		
Answer options	Not at all useful	A little useful	Somewhat useful
Librarian contact information	0	0	0

APPENDIX C (*continued*)

EDD 1105 library and research support survey results			
Links to recommended databases	0	0	0
Links to recommended journals	0	0	0
APA citation style help	0	0	0
Research tips (HTML vs. PDF, DOIs, remote access directions)	0	0	2

6. What library resources and instruction may be useful for future courses?

Answer options	Response percent
Video tutorials	50.0%
Social media communications (Twitter, Facebook, Instagram)	25.0%
Additional face-to-face library classroom sessions	100.0%
Virtual library "classroom" sessions	50.0%
Other (please specify)	0.0%

7. During the course, did you request assistance from the librarian regarding your research?

Answer options	Response percent
Yes	80.0%
No	20.0%

8. Why did you not request assistance?

Answer options	Response percent
I did not know a librarian was available.	0.0%
I did not need help.	0.0%
I did not know how to contact the librarian.	0.0%
Other (please specify)	100.0%

1	May 6, 2014 3:53 PM	I know everything

9. What assistance from the librarian did you request? (check all that apply)

Answer options	Response percent
Defining effective keywords and phrases related to your topic	60.0%
Identifying reliable and relevant information sources (i.e., databases, books, websites)	40.0%
Applying effective information search strategies (i.e., narrowing search results)	40.0%
Using information ethically (i.e., avoiding plagiarism, paraphrasing)	0.0%
Applying the APA citation style (bibliography, in-text citation, general information)	40.0%
Other (please specify)	0.0%

10. Please indicate your overall satisfaction with the research assistance provided by the librarian.

Answer options	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied	Rating average
	0	0	1	1	3	4.40

11. Please rate the methods used to communicate library support and information.

Answer options	Not at all useful	A little useful	Somewhat useful	Quite useful	Very useful	Rating average
Research discussion/Wiki Board	0	0	0	3	1	4.25
Email	0	0	0	1	3	4.75
Blackboard announcements	0	0	1	1	1	4.00
Course instructor's communications (email, class announcements)	0	0	0	2	2	4.50

APPENDIX D

Student pre-class survey.

1. What class section are you a student?

2. Please rate the following library topics based upon your interest level for including in the library session.

Answer options	Not interested	Somewhat interested	Very interested
Getting started with a literature review: topic ideas, keywords and phrases	30%	0%	70%
Identifying reliable resources (databases, journals, Google Scholar, Ulrich's Periodical Directory)	20%	50%	30%
Effectively searching databases (portable document format, date ranges, full-text articles, meta-analyses, empirical articles)	10%	30%	60%
Accessing resources by citation, DOI and using inter-library loan (ILL)	20%	40%	40%
Managing sources with database accounts and Zotero (free online citation tool that saves and organizes reference information and articles, with the ability to add notes, tags, and attachments, synthesize a bibliography)	10%	20%	70%
APA citation and formatting	10%	40%	50%

3. Are there additional library or research topics you would like covered?

Number	Response text	Categories
1	Keyword phrases mostly	
3	Topic of birth order and Second Language Acquisition (SLA)	
4	English as a Second Language (ESL)	
5	Early childhood education — children's development	

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