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## **A Flexible, Graded Library Unit for PETE Majors**

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### **Abstract**

We describe a library instruction unit for sophomore physical education teacher education (PETE) majors. The unit consisted of a 75-minute classroom session in the library, followed by a librarian-designed and -graded assignment worth 8%-20% of the course grade. Most student work and librarian feedback on the assignment were delivered through the Moodle course management system. This unit's moderate, manageable format, which was used both fall and spring semesters, 2007-2012, can be adapted for other majors.[1]

### **Introduction**

Effective college-level library instruction initiatives incorporate one or more of the following elements. First, they emphasize collaboration between librarians and course instructors, perhaps through the librarian's liaison assignment. Second, they place library instruction in courses that reach students at important points in the curriculum (such as first year courses, general education courses, required courses in the major, or research-oriented courses). Third, there is enough librarian involvement, and enough incorporation of library research skills into the course and the grade, for the initiative to have a strong impact on student learning.

The library instruction unit we describe involved a required course for physical education majors who plan to be teachers. The librarian (a liaison to the department) collaborated closely with the course instructor during the five-year period that the library unit was offered. The librarian taught an instruction session in the library, designed and graded a library assignment, and updated the assignment and its supporting materials, as needed, in the course management system.

Some sections of this essay were written separately, to show our personal perspectives on this collaboration. Ben Sibley writes from the perspective of a physical education professor. Glenn Ellen Starr Stilling writes from the perspective of a librarian. In other sections, when first person is used, the speaker is Stilling.

### **Intersection with the library instruction literature**

The English-language library instruction literature has not addressed instruction specifically for physical education majors. Recent scholarship on library instruction for educators (including our target group, pre-service teachers) includes a special issue of

*Behavioral & Social Sciences Librarian*. This special issue includes an annotated bibliography of articles since the late 1980s, which shows that much of the literature on information literacy instruction for educators has focused on preparing pre-service teachers to collaborate with school librarians in teaching information literacy to their students (Shinew and Walter).

Teacher education instructor Eva Dubozy and librarian Julia Gross conducted a semester-long trial of supplementing face-to-face library sessions with four non-required podcasts and vodcasts embedded in the course management system. The education-specific tutorials were targeted to the needs of first-semester teacher education students. Dobozy and Gross found that, although students were “strongly encouraged” to do so, 23% or fewer accessed each module, and even fewer participated regularly in the online forum. The authors concluded, “simply providing more information through embedded library modules in a given unit of study is not likely to be an effective strategy” (95, 97).

Our essay extends the literature on library instruction for pre-service teachers by providing a detailed description of an instructional unit for majors in a specific field of education, as well as an example of how library instruction can have a stronger impact on a specific course.

Our collaboration also intersects with the embedded librarians movement. Writing about the movement’s origins in special libraries, David Shumaker and Mary Talley describe embedded librarianship as “shifting the model from transactional to high trust, close collaboration and shared responsibility for outcomes” and necessitating “long term planning between the customer and the librarian” (qtd. in Brower, 3). Shumaker, in “Beyond Instruction: Creating New Roles for Embedded Librarians,” notes that embedded library instruction programs are “delivering instructional services directly related to course content and directly supporting student learning objectives”. Still, he says, “embedded library services have not achieved their full potential in colleges and universities”. Current endeavors “embedded the library into the instructional process—but not in the academic enterprise as a whole”. Moreover, to be truly embedded, instructional services “must be customized” and “delivered within the context of the course” (20). He adds that “most reports of academic embedded services . . . say little or nothing about the working relationships between subject faculty and librarians” (17, 20, 24).

Mary Dugan’s description of an embedded librarian project at Purdue University is an exception to Shumaker’s critique in that Dugan does report on the librarian/course instructor relationship. Dugan’s collaboration, like ours, focuses on students in the major: an agricultural economics course for juniors and seniors. The librarians’ involvement consisted of designing a course-specific Web page; assigning a librarian as a liaison for each student team; meeting with the student teams during class time early in the semester; answering questions submitted by students throughout the semester; and attending students’ end-of-course research presentations. The course instructor perceived that the embedded librarian initiative improved student work, but she added that “librarians could be even more involved in the students’ learning process”; and students commented that librarians’ help saved them time, but they forgot about the librarians when they were not present. These faculty and student comments led Dugan to reflect, “Clearly, we must raise our profile in the class, or risk remaining invisible”. Dugan and her colleagues counted, among their lessons learned, that “the librarians should contribute to evaluation of the research with the professor, and evaluation should include information literacy” (306, 307, 308).

As we will demonstrate, our collaboration exhibits the trust, close collaboration, and shared responsibility for outcomes that, according to Shumaker and Talley, are hallmarks of embedded librarianship.

Our collaboration doesn't just reach forward, as a more robust form of embedded librarianship. It also reaches back, exemplifying a concept from the early history of library instruction. In her library science textbook, Anne F. Roberts describes course-integrated instruction as "a necessary part of the course, and the course objectives and course design are built into the library instruction assignments" (69).

### **Intersection with the physical education teacher education (PETE) literature**

The PETE literature reveals concerns about the work of in-service PE teachers that confirm the relevance of our collaboration.

Kretschmann writes about the difficulties in-service PE teachers face in keeping current on content knowledge and pedagogical practices. He discusses barriers they are likely to face with access to commercial databases for their field (primarily SPORT Discus) and free access to the full text of journal articles. He suggests strategies teachers can use when they do not have on-site access to a college library and cannot afford the cost of individual articles or a journal subscription.

He discusses using free, open access databases such as ERIC, PubMed, DOAJ, and Google Scholar. He also discusses Google search strategies for finding PDFs of research articles, or finding authors' contact information and contacting them to request a copy of the article (282-83). One strategy he omits is requesting journal articles through interlibrary loan via the local public library.

Librarians can be even more helpful to PETE students by being mindful of this future need. Rather than focusing, in library instruction sessions, just on students' upcoming assignments, we can remind students of the future needs that Kretschmann articulates well in his article. We can highlight the open access strategies he discusses. We can also mention services for community users provided by public and academic libraries and, when applicable, by virtual library projects such as NCLIVE (North Carolina) and GALILEO (Georgia).

Pill studied secondary PE teachers in Australia to determine their relationship to current research and scholarly writing that they could use in their work. His concerns about PE teachers are the same as Kretschmann's. He wondered, "To what degree is PE teaching informed by academic reading?" His online survey of 53 secondary PE teachers revealed that nearly half believe that doing research on PE and publishing the results is important. However, a smaller number indicated that the PE research literature informs how they plan and execute their teaching. More than half did not respond to the question about publications they read for professional learning, and few indicated that they use research publications, professional publications, or books to stay up to date (368, 373).

### **PETE majors' need for library instruction, by Ben Sibley**

Public school PE teachers face complex challenges. First and foremost, they strive to positively impact students' health-related behaviors and attitudes. This includes teaching motor skills, sports and fitness knowledge, and nutritional practices; improving fitness levels; and influencing students' beliefs and values regarding health and physical activity (National Association for Sport and Physical Education, 2004). PE teachers are often trying to achieve these goals in the face of limited time in the school curriculum, unmotivated students, and competition from computers, video games, and other sedentary activities. They are also working with a diverse student population with varying desires and needs (including physical and cognitive disabilities).

Unfortunately, it is outside the scope of a four-year university degree program to provide physical education (PE) pre-service teachers (PSTs) with all the skills and knowledge needed to do their future jobs. For example, a teacher might encounter a student who has a rare genetic condition, such as Apert Syndrome. Our PSTs take a course on adaptive PE, but it does not cover all physical and cognitive disabilities. That teacher must research Apert Syndrome in order to modify the PE activities for the student. Other problems and issues our PSTs will face in their thirty-plus year teaching careers don't yet exist. For instance, new sports and activities are always being created. Crossfit is a popular program that I now use in my fitness teaching, but it did not exist ten years ago. In order to stay current, I have found it necessary to research this and many other topics on my own.

Given the above conditions, it is imperative that PSTs learn to find and evaluate valid, reliable resources related to their profession. However, I cannot give curricular time to a library unit that doesn't also contribute to the PE teacher education learning outcomes our program is required to achieve. In what follows, we describe a library instruction unit that introduces our PETE majors to the library research/information literacy skills they will need to become effective, motivated teachers and coaches while engaging them in critical thinking on topics associated with their profession.

### **Description of the course and program**

PE 1550 (Foundations in Teaching and Learning in Physical Education) is a required course for majors in Appalachian's B. S. degree in Physical Education, specifically in the course of study in the PETE program. This program prepares students to be K-12 physical education teachers and coaches. PE 1550 is an introduction to the profession of physical education, taken within the first block of professional classes, usually at the end of the sophomore or beginning of the junior year. Some of the course's major topics are natural targets for alignment with information literacy: the purpose of physical education, aspects of quality physical education programs, characteristics of professional teachers, and issues that affect physical education as a field. The PETE program adheres to professional standards that create the expectation that its graduates will have strong library research skills:

1. The National Association for Sport and Physical Education (NASPE) 2008 National Standards for Initial Physical Education Teacher Education: "Standard 1: Scientific and Theoretical Knowledge. Physical education teacher candidates know and apply discipline-specific scientific and theoretical concepts critical to the development of physically educated individuals" (5).
2. NASPE's Initial Physical Education Teacher Education Standards: "Standard 6: Professionalism, Outcome 6.5: Teacher candidates will: Identify and use resources that enhance student learning, program development, and opportunities for physical activity." [2]

### **Advantages of the library instruction unit**

Our unit, comprised of a 75-minute classroom session in the library, followed by a librarian-designed and -graded assignment worth 8%-20% of the course grade, improved on a one-shot library instruction session without an assignment in the following ways:

- *Greater impact, reasonable time requirements.* For librarians, this unit provides more feedback to individual students during their learning process than a library session with no librarian follow-up. Students' performance on our assignment indicates that the mix of tasks required, level of teacher expectations, time required, and grade weight are well chosen. For both course instructors and librarians, the classroom time is the typical single class session.
- *Use of technology.* The assignment is well integrated into the Moodle course management system. Handouts from the library session, as well as the grading rubric for the assignment, are posted there. Each task on the assignment is a separate Moodle page and/or activity, supported by on-screen hints, instructions, and screenshots. The

librarian does most of the grading and commenting in Moodle and then records the assignment grade in the Moodle course gradebook.

- *Instructional feedback to the librarian.* Unlike the typical one-shot library session, this unit enables the librarian to see how individual students perform when they practice, with a new topic, skills taught in the library session. It also shows the librarian how students informally integrate library materials into their thinking and writing at an early stage. When librarians review student work, it is usually at the finished product stage.

### **The library assignment**

The library assignment gives students practice, with feedback, on (1) constructing database searches for books and journal articles in their field; (2) making “best choices” from their search results, and justifying those choices; and (3) reading, and writing about, a research-based scholarly journal article as well as a professional journal article. Each assignment task, in condensed form, is shown below. Following each task are suggestions for how the task aligns with the Association of College and Research Libraries (ACRL) Information Literacy Competency Standards for Higher Education (2000) and Framework for Information Literacy for Higher Education (2016).

#### *Task 1.*

Activity: Searching for books, with emphasis on search construction.

Student instructions: Search the library catalog for books on teaching PE at the high school level. Select five or more Best Choice books. Print the full records for these items from the catalog. Annotate each record (highlight, circle, underline, or write notes) to show evidence of the criteria the book meets.

Aligns with: ACRL Standards 2.2, 2.3.a, 3.2; ACRL Frame: Information creation as a process. Knowledge practice: Recognize the implications of information formats that contain static or dynamic information. ACRL Frame: Searching as strategic inquiry.

#### *Task 2A.*

Activity: Write about a research-based scholarly journal article.

Student instructions: Use the citation for a scholarly journal article by Penelope Portman to find the electronic full text. Read/skim the article to answer the following question:

“According to the students surveyed in this research study, are physical educators succeeding or failing in encouraging students to be physically active?”

Write a paragraph of at least 500 words that provides a concise but detailed, tightly written answer, focusing on the article’s research findings (especially the Results and Discussion sections).

Aligns with: ACRL Standards 2.3, 3.1; ACRL Frame: Research as Inquiry. Knowledge practice: Draw reasonable conclusions based on the analysis and interpretation of information.

#### *Task 2B.*

Activity: Write about a research-based scholarly journal article.

Student instructions: Using the Portman article again, answer the following question. Divide your answer into three paragraphs, each at least 250 words long.

“Explain, in your own words, two of the Themes that came out in Portman’s discussions with the ninth-grade students, and what they meant in terms of the students’ satisfaction with PE classes [Paragraphs 1 and 2]. Then, after reflecting on all six Themes, explain three things you think you should, or should not, do as a PE teacher [Paragraph 3].”

Aligns with: ACRL Standard 3.1; ACRL Frame: Research as Inquiry. Knowledge practice: Draw reasonable conclusions based on the analysis and interpretation of information.

#### *Task 3.*

Activity: Find the online full text of a professional journal; select an article and write about it.

Student instructions: Go to the full text of the journal JOPERD. Select and read an article of personal interest, and write a paragraph of at least 500 words. About one third of the paragraph should describe why the article interests you. About two thirds should describe two or more things you learned from the article.

Aligns with: ACRL Standards 2.3, 3.1; ACRL Frame: Research as Inquiry. Knowledge practice: Formulate questions for research.

#### *Task 4.*

Activity: Searching for journal articles, with emphasis on search construction.

Student instructions: Search the ERIC database for journal articles on the following topic: Teaching PE at the elementary level using games. Select three or more Best Choice articles, using the list of criteria discussed in the library instruction session. Save full records for your articles, print them (along with your search history), and annotate them, as in Task I.

Aligns with: ACRL 2.2, 2.3.a, 3.2. ACRL Frame: Information creation as a process. Knowledge practice: Recognize the implications of information formats that contain static or dynamic information. ACRL Frame: Searching as strategic inquiry.

#### *Task 5.*

Activity: Searching for journal articles, with emphasis on search construction.

Student instructions: Search the ERIC database again, using a PE topic of your choice. [Instructions are similar to Task 4.]

Aligns with: ACRL 2.2, 2.3.a, 3.2. ACRL Frame: Information creation as a process. Knowledge practice: Recognize the implications of information formats that contain static or dynamic information. ACRL Frame: Searching as strategic inquiry.

### **Showing students the benefits of a research-based journal article**

The journal article selected for assignment tasks 2a and 2b (Portman) works well in several ways. First, it touches on an important goal for PE teachers: instilling in students both the skills and the desire to engage in regular physical activity. Second, Portman's research study focuses on students' experiences in their ninth-grade PE classes—the last year of required PE. For our sophomore PETE majors, this ninth-grade class may be a not-too-distant memory; moreover, some of them may be planning to teach PE at this level.

This article's narrative format is also an advantage. Portman reports on individual interviews with 46 students—male and female, low-skilled and high-skilled—about their largely negative experiences in their ninth-grade PE class. She summarizes her qualitative analysis of the interviews by presenting seven themes that emerged, such as “Gym is fun when I can do it” and “Separate [i. e., non-coeducational] is better.” Her discussion of each theme includes composite stories merging the experiences of many students. To illustrate the stories, she includes three or four brief quotations, with each speaker identified as a high-skilled or low-skilled student. This theme/story/quotations format makes the research results—and, thus, the lessons our students could derive as future teachers—very accessible.

Our students' work on the two essay questions about this article showed a range of responses and insights. Surprise at the research subjects' negativity was the most common response. The following excerpt from a student's work on task 2a shows subtlety in its insight:

Toward the end of Portman's discussion portion of the article, she cites, ‘Physical education experiences of the low skilled students appeared to hinder their participation in any organized physical activity once their requirement was completed.’ The question was not, does physical education encourage highly skilled students to be physically active, and so, it is obvious that these educators are not succeeding with all students. All students should hear and understand the message that physical education has a lifelong physical and emotional benefit.

### **Showing students the benefits of a professional journal**

*JOPERD* (formerly *Journal of Physical Education, Recreation and Dance*) works well for our assignment because of its long publication history (it began in 1898), wide availability in libraries, publication by a major professional association, focus on issues important to educators, and relatively brief articles. In the library session, students learn to browse the online tables of contents of recent issues, since this is probably the way their course instructors and in-service teachers use the journal. On task 3 of the library

assignment, students selected *JOPERD* articles that fit a variety of personal interests. One chose an article that prepared her to teach in an urban school:

I chose this article basically because it screamed my name. I know there will be challenges I will face working inside a city school . . . I have been in city schools as well as rural schools, and the tactics and criteria for the type of teachers are very different.

### **Principles of learning, by Glenn Ellen Starr Stilling**

Foremost in my teaching, I seek to apply principles that enhance long-term retention and transfer. Psychologist Diane Halpern calls practice at retrieval “the single most important variable” in promoting this goal. Learners need to retrieve information frequently to strengthen their memory traces, and they also need to apply it to new questions to strengthen transfer (38-39). I use this principle to teach multiple-concept keyword searching. In the library instruction session, I introduce students to a model for this kind of database searching. They practice this model in class with both the Library Catalog and the ERIC database. They practice it again on the assignment—once in the Library Catalog and twice in ERIC.

Halpern also states that “varying the conditions under which learning takes place makes learning harder for learners but results in better learning” (39). This principle, too, is applied when I teach multiple-concept keyword searching. The library assignment varies students’ learning conditions by giving them one search question that differs only slightly from the in-class questions; a second which differs a bit more; and a third question requiring students to construct a search for their own topic.

Halpern advises that “what and how much is learned in any situation depends heavily on prior knowledge and experience” (39). Because learners construct knowledge by integrating new information with what they already know, she urges teachers to discover and use students’ prior knowledge and beliefs. I use this principle in the library assignment (tasks 2a and 2b) first by choosing a scholarly journal article about ninth grade PE classes, hoping students would respond to the writing prompt by linking the student stories from the article to their own experiences. Second, I directed students to make their own connections by selecting an article of personal interest from *JOPERD* (task 3). A third use of this principle was the writing prompt asking students what they would, or would not, do as teachers, based on the themes in the scholarly journal article (task 2b). I thought the article might reveal to them mistaken assumptions they held about teaching PE, stemming from their own experiences.

I also give students plenty of scaffolding and instructor feedback as they practice and extend their new skills. Thus, in limited ways, I’m using the cognitive apprenticeship model (Svinicki, 67). One place where I use the scaffolding element of this model is in teaching multiple-concept keyword searching. I treat task 5 on the assignment as the stage in which learners attempt the skill entirely on their own. Leading up to this, I provide scaffolding with search questions that are similar to those from the library session (tasks 1 and 4). The hints and prompts on the Moodle pages for all three tasks also add scaffolding. The instructor feedback element of this model comes from my grading of the assignment. I use both a rubric with check boxes, and individualized diagnostic comments. Most of my comments relate to search strategy and to Best Choices from search results.

Cook and Klipfel affirm the value of a cognitive psychological approach to library and information literacy instruction (ILI). They state that student learning should be measured by retention and transfer; therefore, retention and transfer should be the outcomes that information literacy educators aim for. They cite research showing that thus far, ILI has room for improvement on these two outcomes (34-35).

### **Lessons Learned, by Ben Sibley**

- The Moodle course management system allowed the unit to be integrated into the course seamlessly. Since all the resources for the unit are present on my course website, I am kept in the loop on any modifications that Glenn Ellen might make. I was a little reluctant at first to hand over grading for a portion of my course to another instructor. What if her grading was significantly different from mine? What if students complain that her grading is unfair? Would I be forced to undermine the credibility of a colleague by changing the grades she assigned? To our pleasant surprise, this has not been an issue (and this assignment has proven to most certainly not be an easy ‘A’). Glenn Ellen provides feedback to support the assigned grades, and students have been fine with it. This is an important aspect of the unit for me because grading an assignment like this myself (i.e., one that lies outside of my content comfort zone) would be too time consuming; and I probably would not be able to provide the same quality of feedback as my librarian colleague.
- I have directly benefited from this unit in that I see these students again in upper-level courses in our PETE program—courses in which our PSTs must track down professional resources and research articles and integrate them into their teaching. While I have not formally assessed their information literacy skills in this context, it is evident that they are applying what they learned in this unit because (1) the quality of the resources they find is commensurate with expectations, and (2) they do so without asking me for help.

### **Lessons learned, by Glenn Ellen Starr Stilling**

In response to student results, I proposed and implemented the following changes:

- *Increased the grade percentage.* In the second year, Ben agreed to increase the assignment from 5% to 8% of the course grade. Since this better matched the time, effort, and writing demands of the assignment, fewer students left one or more questions blank.
- *Decreased the text accompanying the assignment directions.* I reduced the hints and reminders on the assignment, moving some of them to the grading rubric. Students receive the rubric during the library session, and the assignment directs them to check their work against it before submission.
- *Reduced the goals for the assignment.* I (re)learned that there are limits to what can be accomplished, given one library session and given students’ other commitments. In response, I removed one question, simplified another, and reduced the discrete skills required.
- *Addressed academic integrity.* A few cases of borderline plagiarism and students sharing each other’s writing on the assignment prompted me to add criteria for academic integrity to the grading rubric.

### **The library unit: What happened after 2010**

Ben and I continued our collaboration for two more semesters. In Fall 2011, a different instructor began teaching the course. This instructor continued the library unit, increasing the assignment to 10% and then, in Spring 2012, to 20% of the course grade. The assignment was tweaked in small ways. A different article was substituted for the Portman article, and the questions students wrote about were made more challenging.

The library unit was discontinued after Spring 2012 because the course was redesigned. The course was renamed HPE 2110, Foundations in Health and Physical Education. A lab was added, and in-class meetings were reduced from 28 to 20.

### **Reflections and benefits, by Glenn Ellen Stilling**

I view the decision to discontinue the library unit as a normal, common consequence of changes in the academic curriculum or in the goals that a course instructor must focus on. In my thirty-six years as an instruction librarian, I have seen similar changes in many courses, from first year through graduate level. Changes like these are also made in the corporate environment. For example, Google received praise for their “20% time” philosophy (allowing their programmers to spend 20% of their work week on a side project of their choice, because of the motivating effect of the autonomy it gave them). Daniel Pink notes that Gmail was created as a 20% project (*Drive*, 96). After the 2008



recession, Google began cracking down on the policy, and by 2013, *Wall Street Journal* was calling it “endangered” (Carney and Getz, 2013).

In five years of teaching this unit, I saw concrete improvements. Students became more proficient at searching databases for materials in their field, and they noticed more clues in database records that helped them make good selections from their search results. Their writing showed me that they were making connections to the benefits of professional reading.

As a teacher, I benefited greatly as well. Only from a collaboration like this, where I could design and grade student work, would I have learned so much about these majors at this point in their program. The level of feedback on my teaching, and on student learning, afforded by this unit was rich, deep, and, frankly, fascinating. By adjusting the assignment and library session incrementally, and observing the differences, I was motivated to keep improving my practice.

### **Assessment and adaptability**

Ben and I did not assess the library assignment during our four-year collaboration, nor was it assessed in the following two semesters. We realize that formal assessment is needed to confirm our observations and uncover areas for improvement. Below our description of each task on the assignment, we indicate one or two ways in which it aligns with ACRL’s Framework for Information Literacy. Librarians who use our assignment could build assessments using our suggestions. Megan Oakleaf, in her article on using the Framework to assess student learning, suggests writing a learning outcome, such as: “The student will be able to list areas of consensus and disagreement among publications on a topic (Research as inquiry.)” (512). Our assignment could be modified to better fit this outcome by requiring that task 3 use a pre-selected article on the same topic as the Portman article used in task 2A and task 2B. Ben and I discussed the possibility of assessing the assignment by having students complete a survey at the end of student teaching. We would have asked about the extent to which students had used scholarly and professional materials for assignments in other courses, as well as the extent to which they had used the information literacy skills introduced in the unit.

We feel confident in proposing this unit as a model for library instruction collaborations in other disciplines and programs. We believe it could be modified to suit early required courses in other majors, especially those whose graduates will engage in a high degree of critical thinking and problem solving on the job, or those in which the work will require current, rapidly changing knowledge and strategies. It might also work well with general education or writing across the curriculum courses within a discipline or major.

Library staffing levels might limit the adoption of our model. Libraries might have an instruction program that is already at its upper limit. Suitable target courses might have more sections or students than the library can accommodate. Another obstacle might be the difficulty of identifying, for a given course, good fits for search topics, a key journal, key disciplinary databases, or specific journal articles that all students in the course would benefit from writing about.

### **Conclusion**

I remain convinced that this unit is a strong information literacy intervention. The fundamental factors in its success were our close collaboration; ensuring that the unit contributed to both PETE program and information literacy learning outcomes; and our use of principles of learning that lead to long-term retention and transfer. I also believe that this unit is the kind of collaboration David Shumaker had in mind when he proposed that the library be embedded not just in the instructional process but, more broadly, in the academic enterprise.

## Endnotes

[1] This article updates earlier publication in *Academic Exchange Quarterly* (Spring 2012, "A Library Unit for Sophomore PETE Majors," by Glenn Ellen Starr Stilling and Benjamin Sibley).

[2] In its revision of the 2001 standards, NASPE changed from Outcomes to Elements and reduced the number from 44 to 28 (1). The Alignment Chart that compares the 2001 and 2008 Standards does not show Outcome 6.5 (59).

## References

- Association of College and Research Libraries. "Information Literacy Competency Standards for Higher Education." ACRL, 2000, <http://www.ala.org/acrl/standards/informationliteracycompetency>.
- . "Framework for Information Literacy in Higher Education." ACRL, 2016, <http://www.ala.org/acrl/standards/ilframework>.
- Brower, Matthew. "A Recent History of Embedded Librarianship." *Embedded Librarians: Moving Beyond One-Shot Instruction*, edited by Cassandra Kvenild and Kaijsa Calkins, ACRL, 2011, pp. 3-16.
- Carney, Brian M., and Isaac Getz. "How an Endangered Google Policy Got Results." *Wall Street Journal*, 29 Aug. 2013, p. A15.
- Cook, Dani Brecher, and Kevin Michael Klipfel. "How Do Our Students Learn? An Outline of a Cognitive Psychological Model for Information Literacy Instruction." *Reference & User Services Quarterly*, vol. 55, no. 1, 2015, pp. 34-41.
- Dobozy, Eva, and Julia Gross. "Pushing Library Information to First-Year Students: An Exploratory Study of Faculty/Librarian Collaboration." *Australian Academic & Research Libraries*, vol. 41, no. 2, June 2010, pp. 90-99.
- Dugan, Mary. "Embedded Librarians in an Ag Econ Class: Transcending the Traditional." *Journal of Agricultural and Food Information*, vol. 9, no. 4, 2008, pp. 301-309.
- Halpern, Diane F., and Milton D. Hakel. "Applying the Science of Learning to the University and Beyond: Teaching for Long-Term Retention and Transfer." *Change*, vol. 35, no. 4, July/August 2003, pp. 36-41.
- Kretschmann, Rolf. "Moving into the Future: How Physical Education Teachers Can Use the Internet to Keep Up." *Global Journal Of Health & Physical Education Pedagogy*, vol. 3, no. 4, 2014, pp. 281-89.
- National Association for Sport and Physical Education. *Moving Into the Future: National Standards for Physical Education*. 2<sup>nd</sup> ed., NASPE, 2004.
- . *National Standards & Guidelines for Physical Education Teacher Education*. 3<sup>rd</sup> ed., NASPE, 2009.
- Oakleaf, Megan. "A Roadmap for Assessing Student Learning Using the New Framework for Information Literacy for Higher Education." *Journal of Academic Librarianship*, vol. 40, 2014, pp. 510-14.
- Pill, Shane. "Exploring Secondary Physical Education Teachers' Reading." *Global Journal Of Health & Physical Education Pedagogy*, vol. 3, no. 4, 2014, pp. 366-79.
- Pink, Daniel. *Drive: The Surprising Truth about What Motivates Us*. Riverbed Books, 2009.
- Portman, Penelope A. "Are Physical Education Classes Encouraging Students to be Physically Active?: Experiences of Ninth Graders in their Last Semester of Required Physical Education." *Physical Educator*, vol. 60, no. 3, 2003, pp. 150-61.
- Roberts, Anne F. *Library Instruction for Librarians*. 2nd ed., Libraries Unlimited, 1989.
- Shinew, Dawn M., and Scott Walter, editors. *Information Literacy Instruction for Educators*. Special issue of *Behavioral & Social Sciences Librarian*, vol. 22, no. 1. Haworth, 2003.
- Shumaker, David. "Beyond Instruction: Creating New Roles for Embedded Librarians." *Embedded Librarians: Moving Beyond One-Shot Instruction*, edited by Cassandra Kvenild and Kaijsa Calkins, ACRL, 2011, pp. 17-31.
- Svinicki, Marilla D. "The Cognitive Apprenticeship as a Model for Learning Intellectual Skills." *Learning and Motivation in the Postsecondary Classroom*, Anker, 2004, pp. 65-83.