

Using Evidence-Based Principles in Clinical Practice

Holly Storkel, Speech-Language-Hearing

To help students better understand how to use evidence-based principles in clinical practice, Holly Storkel is revising her SPLH 880 course so that students can access evidence from clinical research and apply it to specific patients.

OVERVIEW

Background

Increasing use of evidence-based principles

By revising SPLH 880 Seminar in Speech Language Pathology: Clinical Treatment of Phonological Disorders, I plan to increase students' usage of evidence-based principles in clinical practice. I have been disappointed in the ability of students to adequately use academic literature without my intervention. They need to increase their own ability to deeply understand professional scholarly research that forms the basis for phonological disorders treatment.

The available evidence is continually changing as research progresses and advances are made in our understanding of the nature of sound delays in young children. The most effective clinician is the one who has the most up-to-date evidence. In the 2004 version of this course, students appeared to understand course topics, but that assessment did not measure their ability to find the research evidence independently. Also, they had difficulty synthesizing, integrating, and applying the evidence to clinical practice, a skill that is essential if they are to keep up with the field.

Implementation

Shifting responsibility

A series of student behaviors led me to re-evaluate my current teaching plan: I found that students were relying on me to walk them through the scholarly literature, and they had difficulty synthesizing, integrating, and applying the evidence. I intend to increase their responsibility for seeking out information on their own by revising the course goals, student objectives, and course activities.

I plan to develop new materials in six areas that I believe will increase student learning: revamp online reading quizzes, identify search terms for scholarly readings, adapt eight clinical cases for in-class application of research evidence, determine extensions for each case that will yield evidence and identify search terms, and adapt 12 clinical cases for the final assessments.

Student Performance

Evaluating the impact

I have established three criteria that I will use to evaluate the impact of the new teaching methods on student learning. First, students will need to independently create treatment plans for two different clinical cases. Second, I will look for evidence that

justifies their treatment plan through a system that gives assessment points. Finally, I will compare the results from the revised 2005 course to that of the 2004 course.

In 2004, even students earning an A had difficulty integrating and applying all the evidence discussed in class to their assigned clinical case. Students earning lower grades had even greater difficulty integrating and applying the evidence and also demonstrated fundamental misunderstanding of some pieces of evidence. By having students create treatment plans for two different clinical cases in both written and oral forms, I will have data demonstrating how they integrate and apply evidence. I anticipate that the measurements I have for assessing student skills in several areas will help me to determine the effectiveness of the changes.

Reflections

Making an impact

Although this poster is set up to change a course that I will teach in the future, I need to look at what I can do at this point to affect a positive impact on the class. I have identified six teaching materials that I need to create. These new materials will form the framework that I will use in changing the class work. In turn, that will provide me with an objective set of ideas that I can use to assess the course changes.

The information that I have gathered from the 2004 course showed the areas where students needed additional work. That material, which is directing the changes I have planned, serves to strengthen the course as it provides an objective measuring tool. By including application to clinical cases, I will have one more way to assess their learning. Instructor demonstration and active participation by the students are the means I will use to enact improvement.

BACKGROUND

Overview

Evidence-based practice refers to a style of clinical practice where a clinician routinely consults the evidence from clinical research and applies this evidence to a specific patient. The clinician then closely monitors the patient experiences to evaluate whether or not the changes resemble those reported in the research literature.

The available evidence is continually changing as research progresses and advances are made in our understanding of the nature of sound delays in young children. For this reason, the most effective clinician is the one who has the most up-to-date evidence.

In the 2004 version of the course, students reviewed the available evidence. They looked at treatment targets and treatment methods to promote the greatest change in sound learning for children with significant delays in speech sound acquisition. However, they did not appear to gain independence in their ability to locate, evaluate, and apply evidence to clinical cases.

Why I made changes

- Students appeared to understand the course topics as 100% of them passed a comprehensive online exam. However, I noted problems beyond the exam's coverage:
- Students didn't find the research evidence independently; instead, I provided the evidence and guided them through it.
- Students had difficulty synthesizing, integrating, and applying the evidence to clinical practice.

Key course goals

1. A thorough understanding of the current evidence.
2. The ability to locate new evidence through literature and Internet searches.
3. The ability to synthesize and apply new evidence independently.

Project Notes

Course Syllabus (see PDF)

Word and Sound Learning Lab: html file (<http://www.ku.edu/~wrdlrng>)

IMPLEMENTATION

Revised goals:

- Increase student independence in locating, evaluating, synthesizing, and applying current evidence in order to develop life-long learners.
- Incorporate a greater emphasis on in-class application of evidence.

Revised student objectives: Students will demonstrate that they can:

- Ask answerable clinical questions to guide the search for evidence;
- Perform effective search strategies to locate relevant evidence;
- Efficiently identify key information in the obtained sources;
- Critically evaluate the evidence; and
- Apply evidence to clinical cases.

Revised course activities: Tutorial on reading a research article, online reading quizzes prior to class discussion, review of assigned readings based on quiz performance, generation of search terms used to find the assigned readings, clinical case application, and clinical case extension.

Teaching materials to develop:

1. Create a tutorial on reading a research article.
2. Review and update current online reading quizzes.
3. Identify search terms to find the current readings.
4. Adapt eight clinical cases from my research program for in-class application of research evidence. These cases represent a range of difficulty from clear diagnosis of sound delay to less clear diagnosis of sound delay. Likewise, treatment options range from only a few valid treatment options to a variety of valid treatment options.

5. Determine relevant extensions for each case that will yield evidence and identify appropriate search terms.
6. Adapt 12 clinical cases from my research program for the final assessments (see methods of evaluation). These cases represent a range of difficulty from clear diagnosis of sound delay to less clear diagnosis of sound delay. Likewise, treatment options range from only a few valid treatment options to a variety of valid treatment options.

Project Notes

CTE support

The time that I needed to develop the new materials was financially supported through the CTE Faculty Fellowship program. I had applied for and received a Fellowship in 2004 to work on the questions that had arisen about this course. I decided that the best use of the funds would be to hire a student who would develop the new materials. Through this pedagogical and financial support, I was able to enact the changes I believed would best improve students' learning.

For more information about the CTE Faculty Fellowship program, check <http://www.ku.edu/~cte/programs/fundingOps.html>

Revised course activities rationale

Activity	Rationale
Tutorial on reading a research article.	To help students learn where to find key information in a research article.
Online reading quizzes prior to class discussion.	To ensure that students have completed the readings prior to class. To decrease the amount of in-class time spent on first exposure to concepts in readings. To increase student independence in locating key information in research articles.
Review of assigned readings based on quiz performance.	To ensure that students fully understand the evidence.
Generation of search terms used to find the assigned readings.	To teach students which search terms are useful. To have students evaluate whether the instructor has presented a biased view of a particular topic. To demonstrate the value of evidence-based practice by having students summarize prevailing views at different points in time. (For example, if it were 1990, would you have evidence about this topic? How does it differ from the evidence we have now?)
Clinical case application.	To ensure that students understand evidence well enough to apply it to a case that is highly similar to the research article cases.
Clinical case extension.	To teach students to identify what information they need to obtain in order to make a sound

	<p>clinical decision. To teach students to construct a plan to find relevant sources. This will be implemented by presenting a twist to a previous case application. For example, after formulating a plan for the original case, the students might be informed that the child is a bilingual speaker. Based on that new information, they would then have to locate new information to determine whether the original plan would need to be reformulated.</p>
--	---

STUDENT PERFORMANCE

2004 performance:

1. Students completed reading quizzes prior to class to prepare for in-class discussion. (See performance graph). 50% of the students earned grades of B; 25% earned As and 25% earned Cs.
2. Students orally presented a clinical case providing both a diagnosis and a treatment plan. (See performance graph). 50% of the students earned grades of B; 38% earned As, and 13% earned Cs.
3. Closer examination of case discussions showed that even students earning an A had difficulty integrating and applying all the evidence discussed in class to their assigned clinical case. (See examples of my feedback on case presentations—PDF). Students earning lower grades had even greater difficulty integrating and applying the evidence and also demonstrated fundamental misunderstanding of some pieces of evidence.

Planned student evaluation for 2005:

1. Students will independently create treatment plans for two different clinical cases. They will present one treatment plan orally in a clinical grand rounds session so that students can comment on the other's treatment plans. They will present the other treatment plan in written format.
2. Assessment points. I will assess a number of different pieces of evidence (e.g. evidence related to age-of-acquisition of the selected treatment sound, child's knowledge of the treated sound, and complexity of the treated sound) used to justify the treatment plan, and I will look for accurate use of available evidence.
3. Compare the revised 2005 course performance to the 2004 course performance. (See performance graphs—PDF.)

Project Notes

Graphs of Spring 2004 student performance (PDF).

Samples of individual course presentations with instructor feedback (PDF).

REFLECTIONS

Prof. Storkel's reflections:

The 2004 reading quiz performance indicates that students were having difficulty answering quiz questions prior to class discussion. This suggests that many students were not really independent in their ability to extract and understand the relevant details of a research article. Students may need greater instruction in how to read a research article. Also, student performance may improve if they were required to answer questions about fewer research articles early in the course so that they could spend more time understanding each individual article and make notes about how to read and interpret a research article.

The 2004 clinical case presentations suggest that almost all students had difficulty integrating all the information covered in class and applying this information to a clinical case. Students clearly need explicit instruction and practice in applying evidence to clinical practice. Understanding the evidence does not appear to guarantee that a student can use the evidence effectively.

Next steps:

1. I designed the planned course revisions in an attempt to improve students' ability to independently locate and evaluate evidence. I anticipate this will occur by teaching students appropriate search terms that they can use to locate evidence and by providing instruction on how to read a research article.
2. These planned course revisions will include increased opportunities for students to apply the evidence to clinical cases. Instructor demonstration and active participation by the students are the means I will use to enact this improvement.