

Research: The Concept Anchoring Routine

Overview

The Concept Anchoring Routine is a set of procedures teachers use to plan and deliver information to students about a major concept that is foundational to a unit of study. The key to this routine is relating the new concept to a concept with which students are already familiar. The purpose of this study was to determine the effects of the routine on student learning. A total of 83 students participated. They were enrolled in eight science classes which were randomly assigned to either Condition 1 (n = 39) or Condition 2 (n = 44). The performance of four subgroups of students was monitored: high achievers (HA), normal achievers (NA), low achievers (LA), and students with learning disabilities (LD).

Figure 1: Design for the Concept Anchoring Routine Study

Condition 1: Sub-Groups of Students

Concept	LD	LA	NA	HA
Pyramid of Numbers	Enhanced	Enhanced	Enhanced	Enhanced
Commensalism	Not Enhanced	Not Enhanced	Not Enhanced	Not Enhanced

Condition 2: Sub-Groups of Students

Concept	LD	LA	NA	HA
Pyramid of Numbers	Not Enhanced	Not Enhanced	Not Enhanced	Not Enhanced
Commensalism	Enhanced	Enhanced	Enhanced	Enhanced

Two concepts were chosen as the targets of the instruction: commensalism and pyramid of numbers. Both concepts were instructed in both conditions; however, in Condition 1, commensalism was taught using the Concept Anchoring Routine, while in Condition 2, pyramid of numbers was taught using the routine. When the routine was used, the concept was called the "enhanced concept." A counterbalanced design was used with one concept being taught using the routine and one concept being taught with traditional lecture methods in each condition and then flip-flopping the concepts and the type of instruction for the other condition. Figure 1 displays the design. A researcher who was a certified teacher provided the instruction.

A 32-item multiple-choice test served as the outcome measure. Items on the test related to information associated with the two taught concepts: commensalism and pyramid of numbers. A student's score was the percentage of items answered correctly on the test.

Research: The Concept Anchoring Routine

Results

Figure 2 displays the results of the study for the different subgroups of students on a test over the information related to the two concepts. The pink bars show the results for the commensalism concept, and the blue bars show the results for the pyramid of numbers concept. In essence, with one exception (when high achievers were taught about commensalism), all of the subgroups earned higher scores on the test when the routine was paired with the concept than when traditional instruction was paired with the concept. For example, when students with LD participated in the routine, they earned an average test score of 69% on Pyramid of Numbers items and 55% on Commensalism items. When they did not participate in the routine, they earned an average test score of 36% on Pyramid of Numbers items and 40% on Commensalism items.

For the student groups as a whole, students who participated in the routine earned significantly higher scores on the test items than those who did not: Commensalism [$F(1, 81) = 20.03, p = .000$]; Pyramid of Numbers [$F(1,81) = 9.12, p = .001$].

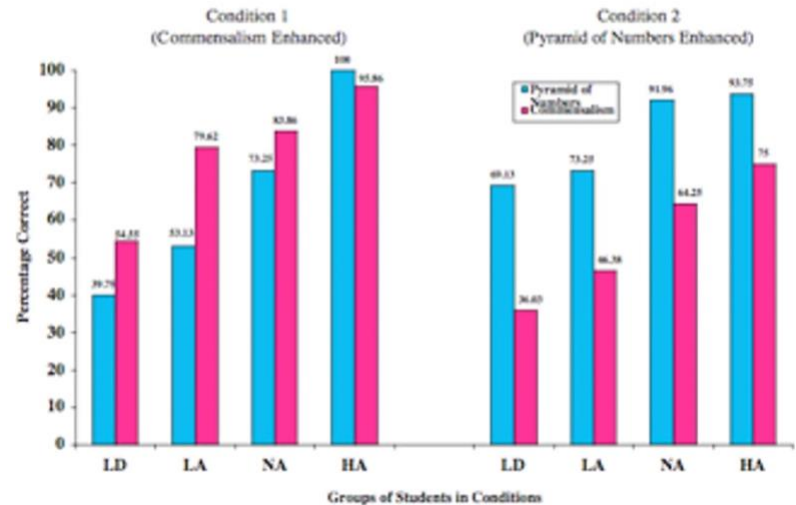
Conclusions

This study demonstrated that use of the Concept Anchoring Routine by a researcher providing instruction to students can enhance student performance on researcher-made tests. All subgroups of students benefited from the use of the routine, with the exception of the high-achieving students in relation to one of the concepts.

References

- Bulgren, J. A., Deshler, D. D., Schumaker, J. B. & Lenz, B.K. (2000). The use and effectiveness of analogical instruction in diverse secondary content classrooms. *Journal of Educational Psychology*, 92(3), 426-441
- Deshler, D. D., Schumaker, J. B., Bulgren, J. A., Lenz, B. K., Carnine, D., Grossen, B., Jantzen, J, E. (2002). Teaching students with LD how to master difficult content by anchoring it to what they know. *Teaching Exceptional Children*.

Figure 2: Results for Student Subgroups



Research: The Concept Anchoring Routine

Study 2

The purpose of this investigation was to determine the effects of professional development workshops on teacher use of the Concept Anchoring Routine. Ten general education teachers of subject-area courses participated, and each teacher targeted one class. A total of 193 students participated in the targeted classes. A checklist was used to measure teacher use of the routine during regularly scheduled classes. Items on the checklist corresponded to the behaviors teachers should exhibit as they implement the routine. The teacher's score was the percentage of behaviors on the checklist that the observer witnessed and recorded on the checklist. A multiple-baseline across-teachers design was used.

Results

During baseline (before instruction), the teachers performed a mean of 4% of the behaviors on the checklist. After instruction, the teachers performed a mean of 94% of the behaviors as they were using the routine in their classes with the students.

Conclusion

The teachers learned to use the Concept Anchoring Routine in a relatively short amount of time at mastery levels. In fact, all but one teacher exceeded the mastery level the first time that they used the routine in class. Once they attained that level, they maintained it.

References

- Bulgren, J. A., Deshler, D. D., Schumaker, J. B. & Lenz, B.K. (2000). The use and effectiveness of analogical instruction in diverse secondary content classrooms. *Journal of Educational Psychology*, 92(3), 426-441.
- Deshler, D. D., Schumaker, J. B., Bulgren, J. A., Lenz, B. K., Carine, D., Grossen, B., Jantzen, J. E. (2002). Teaching students with LD how to master difficult content by anchoring it to what they know. *Teaching Exceptional Children*.

Research: The Concept Anchoring Routine

Study 3

Overview

The purpose of this study was to determine the effects of teacher use of the Concept Anchoring Routine on student learning. One of the ten teachers who participated in Study 2 volunteered for this study. Eighteen of the students in one of her seventh-grade life-science classes volunteered as well. An ABAB reversal design was used. The teacher chose four concepts to be taught. She used the routine to teach the first and third concepts. The second and fourth concepts were taught using a traditional lecture-discussion format. A nine-item test was administered by the teacher the day after each concept was taught. The four tests were designed to have parallel open-ended questions focused on the concept that had just been taught.

Results

After the first concept, epiglottis, was taught using the routine, the students earned a mean score of 83% on the test. After the second concept, pancreas, was taught with traditional methods, the students earned a mean score of 27%. After the third concept, alveoli, was taught using the routine, the students earned a mean score of 70%. After the fourth concept, esophagus, was taught through traditional methods, the students earned a mean score of 42%. A significant difference was found between the test scores associated with the routine and the test scores associated with traditional methods in favor of the scores earned after the routine had been used [$t(34) = 9.11, p < .000$].

Conclusions

This study demonstrated that teacher use of the routine in an actual life-science class was associated with enhanced learning by students. Students earned higher scores on specially designed concept tests after they had participated in the routine versus traditional instruction.

References

Bulgren, J. A., Deshier, D. D., Schumaker, J. B. & Lenz, B.K. (2000). The use and effectiveness of analogical instruction in diverse secondary content classrooms. *Journal of Educational Psychology*. 92(3), 426-441.

Deshler, D. D. Schumaker, J. B. Bulgren, J. A., Lenz, B. K., Carnine, D., Grossen, B., Jantzen, J. E. (2002). Teaching students with LD how to master difficult content by anchoring it to what they know. Research Brief. KU Scholar Works.