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Remedial Solution Proposed Via Brain Research

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Scenario

Students enter higher education requiring remediation before they can be expected to be successful as they progress through their courses. The students enter from many different high schools with a variety of personal backgrounds. It is the job of leadership in institutions of higher education to suggest attributes of general education programs that are likely to be successful in increasing student learning and enhancing the likelihood of transferring knowledge from developmental classes to later programs of study.

Diagnosis

While there are many ideas and suggested reasons why students enter institutions of higher education needing remediation, the crux of the issue lies not in the diagnosis of the problem but in the delineation of the solution. Without the diagnosis, however, one cannot derive a viable solution. One of the foremost illustrated reasons for the need of remediation stems from cultural or social background problems. To this end, the Committee on Developments in the Science of Learning, the Committee on Learning Research and Educational Practice, and the National Research Council (2000) note, "School failure may be partly explained by the mismatch between what students have learned in their home cultures and what is required of them in school..."(p. 60). Furthermore the committees note, "Everyday family habits and rituals can either be reinforced or ignored in schools, and they can produce different responses from teachers" (2000, p. 60). Both of these quotes point not simply to the home culture as holding blame but also illustrate the fact that schools are often incorrectly matched to what the student brings.

Building upon this idea that schools and the instruction that students receive in school are/is mismatched to what the student brings from his/her home culture, this mismatch often leads to poor learning. This poor learning often stems from the student learning something incorrectly: the school teaches the material correctly but the student learns the material in an incorrect manner and assumes this is the correct method of completion. The Committee on Developments in the Science of Learning, Committee on Learning Research and Educational Practice, and the National Research Council (2000) note this by saying, "A more problematic situation occurs when people construct a coherent (for them) representation of information while deeply misunderstanding the new information. Under these conditions, the learner doesn't realize that he or she is failing to understand" (p. 58). The problem here lies in the fact that this occurs over and over again with no steps taken to reverse this effect. The text notes that, "formal instruction had done little to overcome [students'] erroneous prior beliefs. Clearly, presenting a sophisticated explanation in science class, without also probing for students' preconceptions on the subject, will leave many students with incorrect understanding" (Committee on Developments in the Science of Learning, Committee on Learning Research and Educational Practice, & National Research Council, 2000, pp. 58-59).

Adding insult to injury, repetition of poor instruction seems to ratify the idea of misunderstanding. To

this end, instruction leading to college entry often focuses upon one methodology or context. The Committee on Developments in the Science of Learning, the Committee on Learning Research and Educational Practice, and the National Research Council (2000) note that, “Knowledge that is taught in only a single context is less likely to support flexible transfer than knowledge that is taught in multiple contexts” (p. 66). In the conclusion to chapter 3, to add to this argument, the text notes that students who are taught only one method of approaching arithmetic (counting-based) will have a much more difficult time tackling rational numbers. If schools are mismatched to what the student brings from his/her home culture and previous knowledge, and if schools remain oblivious to the fact that students often build inaccurate constructs (accurate to them), adding to this the fact that schools simply focus on one context of instruction, the student is doomed to persist in a world of failure thus necessitating remediation at the point of college entry.

Solution

Simply put, remedial programs must assess to a complete degree the entering students to assign a baseline of knowledge and to better understand the misconceptions and poorly-aligned constructs that the student brings to the remedial classroom. To this end, *How People Learn: Brain, Mind, Experience, and School Expanded Edition* (2000) notes that, “Effective teaching supports positive transfer by actively identifying the relevant knowledge and strengths that students bring to a learning situation and building on them” (Committee on Developments in the Science of Learning, Committee on Learning Research and Educational Practice, & National Research Council, p. 66). Furthermore, it is asserted that effective teaching identifies these strengths by pairing them with an identification of weaknesses. Moreover, these weaknesses, in effective teaching, are then addressed and remediated/mitigated in order to reach a more solid baseline of understanding. Once the weaknesses are found- once the ill-conceived constructs are identified- the text notes that, “teachers must strive to make students’ thinking visible and find ways to help them reconceptualize faulty conceptions” (Committee on Developments in the Science of Learning, Committee on Learning Research and Educational Practice, & National Research Council, 2000, p. 59). Without addressing the weaknesses, without reconceptualization, the student will simply remain within the confines of failure.

A final point: remedial programs must be built using multiple contexts of instruction. It is a fallacy to continue the progression of single-context-instruction similar to that which was previously afforded the student entering the remedial classroom. If it is agreed upon that the previous instruction received was not sufficient in teaching the material adequately to the student to prevent the necessity of remediation, repeating the pattern(s) of instruction- simply teaching the same material in the same manner a second or third time- will do nothing to guarantee success. *How People Learn: Brain, Mind, Experience, and School Expanded Edition* (2000) comments that, “With multiple contexts, students are more likely to abstract the relevant features of concepts and develop a more flexible representation of knowledge. The use of well-chosen contrasting cases can help students learn the conditions under which new knowledge is applicable” (Committee on Developments in the Science of Learning, Committee on Learning Research and Educational Practice, & National Research Council, 2000, p. 66).

References

Committee on Developments in the Science of Learning, Committee on Learning Research and Educational Practice, & National Research Council. (2000). *How People Learn: Brain, Mind, Experience, and School Expanded Edition*. New York: National Academies P.

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