

There is a growing awareness among educators and educational psychologists that learning is strongly influenced by individual attributes. There is also a strong belief that assessing students' needs is essential for developing and delivering a learner-centered curriculum.

Dawna Markova (1992) wrote: "Our students' educational needs are continuously changing, but our methods of meeting those needs have not been. We have basically been doing what we've always done and getting what we've always gotten" (30). She argued that it is not the lack of ability but the lack of willingness to persevere in working hard that prevents many students from succeeding. This unwillingness stems from the fact that teachers have failed to use students' strengths in helping them overcome their weaknesses. We have failed to provide them with learning opportunities and activities that could help them leverage their native intelligence and their natural curiosity, wonder, compassion, and responsiveness. We have been teaching them the way we were taught and not the way we wanted to be taught.

Building on an argument by Dr. W. Edwards Deming, a pioneer of quality-management principles, Markova (1992) has explained that people are born with intrinsic motivation, natural curiosity, capacity for invention, self-dignity, love of experimentation, sense of wonder, sense of connection, and joy in learning. Therefore, what we need to be doing is subtracting most of the obstacles that have been placed between the students and their own internal resources. We can do this by teaching students how to access the intelligence they have, how to process information, and how to build trust in themselves in order to accomplish what is relevant in their lives.

To illustrate this approach, I will describe a recent encounter with a former colleague from one of the very progressive four-year liberal arts colleges in Chicago. We talked about our lives and professional careers, and he indicated that he had been trying to use different methods to involve his students in the act of learning. As he recognized himself, most of these attempts had not been entirely successful. Knowing my colleague, I realized that he was sincerely trying to help his students in taking charge of their own education. So I asked him a simple question.

"Do you know your students?"

He replied, "Of course I know my students!"

"Beyond knowing them just as students in your classroom, do you know their likes and dislikes? Do you know what they are good at? Do you know what they can and cannot do? Do you know their socioeconomic backgrounds?"

"Wait a minute!" he replied strongly. "I am an instructor, not a social worker. I don't need to know these things to teach them, and even if I wanted to know them, how could I find out? These days it would make them suspicious of me."

"I do agree with you," I quickly replied. "However, for you to be a successful instructor, it is important that you know your students. The more you know about them, the better an instructor you will be. You don't need to ask every student about their social, ethnic, or cultural life or about what they can and cannot do all the time; but you can certainly give them opportunities through learning activities to share this information with you. I think it's our obligation as instructors to give students opportunities that enable them to be open with us, and help us get to know them.

"Let me share with you what I did in my biology classes that I taught in various colleges and universities, for many years. From the early weeks of the semester in all my courses, I ask the students to demonstrate their understanding of a given scientific concept we studied in the course. I tell my students from the beginning: 'The only thing I am interested in is that you show me that you did understand these scientific concepts. I don't care what means you use, as long as you are able to demonstrate that you understand the given concept.'"

My colleague was somewhat mystified by the purpose of this approach and I told him, "At the beginning of the year my students reacted the same way, but it worked for me and for them. Some of my students chose to answer the given questions in the traditional writing format; some answered them in a storytelling format, wherein they integrated themselves into the story; others used poetry; those gifted in the visual arts used their creativity to express their understanding of the concept; and the questions have also been answered in cartoons, songs, fashion drawings, illustrations, radio interviews, animation, educational games, and many other creative ways.

"I discovered not only that all of the students understood the given concepts and demonstrated their understanding in an effective

way, but that it was also an enjoyable experience for both of us. The most important thing that came out of this experience was that I no longer looked at my students as just males and females sitting in class waiting for me to involve them in learning activities. I started seeing my students as individual, creative human beings who are able to inquire, discover, and explore efficiently and effectively. I began seeing them as artists, painters, poets, writers, cartoonists, graphic illustrators, animators, game designers, and other kinds of practitioners.

"The whole notion of the classroom and the concepts of student/teacher have changed in my mind, and I find myself automatically taking into account the creative abilities and talents of my students in my preparation for a class. While teaching the class I find myself using more and more examples and metaphors related to my students' creative talents, and using those kinds of talents when writing questions. I find myself reading newspaper articles that are related to some of my students' interests and talents. I also noticed an increase in the number of students who stopped by my office during and after office hours. That is what I meant by knowing your students and going beyond the normal expectations of teaching and learning."

My colleague commented, "You must be teaching only one course to dedicate that much time to it, or have a lot of free time in general. I do agree with you, however; this could help instructors to understand their students better, though there must be an easier way to do it."

I just laughed and said, "I don't know about an easier way, but let me know if you discover a more effective way than this one!"

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References

- Andersen, H.O. (1999). Teaching for the future: Teaching tips give preservice teachers a head start. *Science Teacher*, 66(8), 46-49.
- Barrow, R. & Milburn, G. (1986). *A Critical Dictionary of Educational Concepts*. Brighton, UK: Wheatsheaf.

Beidler, P.G. (1986). *Distinguished Teachers on Effective Teaching: Observations on Teaching by College Professors Recognized by the Council for Advancement and Support of Education*. San Francisco, CA: Jossey-Bass.

Cherif, A. (1994). Instructional Strategies That Have Never Failed Us. *Journal of College Science Teaching*, 14(1), 55–58.

Cherif, A. & Gialamas, S. (2000). “Creative Final Projects” in mathematics and science: an

educational instrument for maximizing students’ learning and understanding. *Journal of College Science Teaching*, 29(4), 272–278.

Joyce, B. & Weil, M. (1986). *Models of Teaching*. Englewood Cliffs, NJ: Prentice-Hall.

Markova, D. (1992). *How Your Child Is Smart: A Life-Changing Approach to Learning*. Berkeley, CA: Conari Press.

Papacosta, P. & Hanson, A. (1998). Artistic experiences in science and mathematics. *Journal of College Science Teaching*, 27(4), 250–252.

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