

Is Teaching an Art or a Science?

There are volumes written on the question of whether teaching is a science or an art. Interestingly, it seems many conclude that teaching is both a science and an art. In its simplest form, effective teaching can be seen as the art of applying education research (Makedon). A teacher cannot be effective unless they are able to integrate both the science and the art of teaching. One may be a genius, but if they are unable to communicate their knowledge effectively, they cannot impart that knowledge onto others. Conversely, one may be an excellent orator, able to mesmerize an audience, yet he/she needs to have a knowledge of the subject matter, learning theories and teaching strategies, as well as an understanding of the needs of his/her own students' in order to gain the trust that is essential to creating an effective learning environment.

The science of teaching is the accumulation of information and the improvement of teaching practices based on the information gained (Friendly). The accumulation of information can be viewed on three levels. The most basic set of information would be the acquiring of knowledge in one's subject area in order to be able to teach it. Without it, there is nothing to teach.

The next set of information is that which can be acquired from the study of research performed by others. As N.L. Gage notes, there is a "scientific basis for the art of teaching". For teachers, this scientific base is found chiefly in the social sciences, in the research on learning generated by the disciplines of psychology, sociology, and speech communication. Naturally, the "knowledge" produced by the social sciences, like that of the physical sciences, is growing and ever-changing, subject to correction and open to new findings. But a knowledge base exists and is there to be known and understood by teachers. To be effective teachers, we need to know what is known about how people learn (Davis). This information provides a framework for how we can affect the learning by others of our knowledge of the subject matter.

And lastly, there is the information gained in our own classroom. Most educational research is based on observation, and the effective teacher implements methods and strategies learned from studying research by others and then observes its effect in the classroom. Teachers perform educational research everyday in their classrooms, especially new teachers. They try different theories and approaches, changing a variable here and a strategy there, and then observe its impact on the classroom environment. This continual building of a knowledge base throughout a teacher's career is essential to the science of learning and to being an effective teacher. There are basic tenets of good practice and fundamentals that must be mastered for any art, whether it's painting, film, architecture, or teaching. One must explore the science of the field before one can practice the art (Qualters). However,

research will never be able to identify instructional strategies that work with every student in every class. The best research can do is tell us which strategies have a high probability of working well with students. Individual classroom teachers must determine which strategies to employ with the right students at the right time (Marzano, 2007). It is the application of the science that constitutes the art.

The art of teaching involves not only knowing what to do and how to do it, but also knowing when to do it, and in what situations not to do it. It is this kind of thinking process that takes teaching from a scientific base to an art form (Friendly). These kinds of decisions are not easily made. Effective teachers build these skills over time. As teachers gain experience, they learn to read and understand their student's abilities and needs. Through the application of information learned, they build a foundation of strategies and the knowledge of when and how to apply them. To get through to a student, a teacher must be creative. The creativity that is involved in changing the classroom environment based on study and observation is where the art shines through (Cain). The art of teaching is presentational as well as improvisational. The lesson should be planned and scripted, but an effective teacher allows for the unexpected teachable moment (Reynolds). A couple of years ago, I took a coaching licensure class in soccer. A large part of this class focused on recognizing, and effectively utilizing, "coaching moments" – the real-time, practical application or demonstration of a lesson while students are in the act of learning. Immediately discussing a lesson learned as the result of a mistake or calling attention to something done right. Taking it a step further, the teacher allows the student "doing it right" to demonstrate for the class's benefit. An effective teacher also develops the art of reading his/her students and measuring comprehension and then adjusting the lesson to accommodate the needs of the group (Reynolds).

While the science of teaching is essential – knowledge of subject matter, learning theories and instructional strategies that form the foundation of teaching – it is the mastery of the art of teaching that defines truly effective teachers. Even the proponent of the scientific method in education, John Dewey, did not consider teaching itself to be a science, but a combination of art and science. He once said "If there were an opposition between science and art, I should be compelled to side with those that assert that education is an art" (Makedon).

Through the studies that comprise part of the science of teaching, we have learned that the single most important factor affecting student learning is the teacher. Many studies have quantified that the influence an effective teacher has on student achievement is relatively independent of anything else that occurs in the school. Effective teachers appear to be effective with students of all achievement levels, regardless of the level of heterogeneity in their

classrooms (Marzano, 2001). Another group of researchers—Thomas J. Kane, an economist at Harvard’s school of education; Douglas Staiger, an economist at Dartmouth; and Robert Gordon, a policy analyst at the Center for American Progress— investigated whether it helps to have a teacher who has earned a teaching certification or a master’s degree and found that neither makes a quantifiable difference in the classroom. Test scores, graduate degrees, and certifications—as much as they appear related to teaching prowess—turn out to be about as useful in predicting success as having a quarterback throw footballs into a bunch of garbage cans (Gladwell).

In conclusion, to be an effective teacher, one must not only stay abreast of the latest research and findings in the field of education, but must also continually practice the art of applying this information, assessing what works and refining their approach in order to create an effective learning environment.

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