

## The Functions of a Teacher

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Try as we did, we could not construct a better title for this editorial than Bertrand Russell's essay, with the same title, from his famous or infamous book *Unpopular Essays* (Russell, 1950). Perhaps this editorial will not be considered “unpopular.” We are fairly confident that most of you are glad to be done with the 2016 U.S. presidential election season. Regardless of your reaction to the outcome of the race, one potentially positive outcome is the recognition of the enormous diversity of the U.S. citizenry ethnically, politically, and emotionally. We say “potentially positive” because our citizenry is as diverse in its reactions to this diversity as the diversity itself. Although impossible to determine with any accuracy the diversity of emotions and thinking among our citizens it is, to some degree, derived from the U.S. educational system or wherever our voting public attended school. The focus of our *ASTE* is on science teachers and how they are/were educated as preservice and inservice teachers. Science teachers, as well as all teachers, help to shape the knowledge, abilities, emotions, and thinking of their students. Further, as science teacher educators we help shape the knowledge, abilities, and dispositions of science teachers.

The history of the U.S. school curriculum and its relationship to societal factors provides some context to our discussion. This history has been well-documented and is usually summarized in curriculum courses at the undergraduate and graduate levels. Prior to 1900 a small minority of the population attended high school (approx. 3.8%), but almost 100% of high school graduates attended college. The Committee of Ten (Mackenzie, 1894) was charged with developing a “standardized” curriculum for U.S. schools and the previously mentioned state of affairs was

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clearly evident in the advocated curriculum. That is, the required subjects in the school curriculum were guided by the admissions requirements for college. These were primarily the requirements for admission to Harvard University, not surprisingly the Chair of the committee was Charles Eliot of Harvard University. The industrial revolution arrived on U.S. shores at the turn of the century and the demographics of the school population drastically changed. There was a large influx of immigrants to the U.S. from Europe because of the escalating job and financial opportunities. The U.S. population increased from 60 million to 100 million during 1890–1910 and was increasingly more diverse in terms of ethnicity, values, etc. As a result of the industrial revolution, the U.S. was changing from a primarily agrarian nation to one consisting primarily of urban centers. The jobs were in the cities and family farms were unable to compete with large corporate farms fueled by expensive and efficient agricultural technology. In terms of the educational landscape, a much larger portion of the population now attended high schools, but only a small percentage (i.e., 16.8%) attended college. Schools had to adjust to better meet the needs of this new demographic. *The Cardinal Principles of Secondary Education* (Commission on the Reorganization of Secondary Education, 1918) set forth a reorganization of high schools. In short, schools had to prepare students for the workforce they would enter upon graduation from high school and the schools had to acculturate all the immigrants to the American culture. You may be wondering why the immigrant students waited to graduate from high school before entering the workforce. Child labor laws were relatively ineffective at keeping adolescents from competing for jobs with adults. This gave rise to compulsory education laws. Compulsory education did not arise from the admirable recognition of the value of education. It was just more effective than child labor laws at keeping students in school until adulthood.

In summary, the time period of 1890–1910 is a prime example of how the U.S. educational system changed significantly in response to the reigning historical/social context. What occurred was consistent with Green, Ericson, and Seidman's (1980) discussion of the needs and impact of the various stakeholders involved in education. They identified national/governmental, parental, societal, and incumbent (educators) as the main stakeholders and the needs of the nation/government was of primary importance. The national/government needs were to maintain the integrity of the country/society, or to put in Green and colleagues' words, "to keep the citizens out of jail and off the dole." It is interesting that students' needs were not identified as having a voice. But, that is a story for another day. In their view schools largely serve the needs of the government as opposed to schools being change agents. This view is in opposition to how Bronowski (1956) viewed the important impact of science and science education on the values of society. Bronowski's view was that societies in which science was highly valued were more advanced. In hindsight, Green and colleagues' observation makes perfect sense during periods of increased immigration. Immigrants may not possess the same values, mores, perceptions, and knowledge of the country or society to which they migrate and it behooves the host country to do whatever it can to sustain its identity. Russell (1940, 1950), however, spoke of the inherent dangers to education and teaching within such a perceptual climate. That is, teachers were charged with acculturating

immigrants into the ways and thinking of the host country/society. Above all else, the status quo was to be maintained. Science teachers, as well as all teachers in general, were educated to develop the knowledge, values, and thinking consistent with what the society had dictated was important. Teachers were told what to teach and how to teach it, their opinions and attitudes, unless consistent with the reigning societal wisdom, were unimportant and were to be avoided. Critical thinking, argumentation, and demands for evidence were not stressed. The nature and focus of teacher education at the turn of the century in the U.S. can clearly be deduced.

Russell (1940, 1950) felt that relegating teachers to simply transmitting the knowledge, values, and mores of a society was antithetical to what should be the role of the teacher. He felt that such an approach led to fanaticism and isolation from the global community. Rather, he felt the measure of a good teacher was an individual who fostered in his/her students free thinking, a continuous search for understanding, and appreciation for those who are different than ourselves. He felt that developing students' free and critical thinking enhanced and improved our society. We feel confident that most members of *ASTE* would side with Russell's view. Indeed, our current reforms in science and other disciplines, in the U.S. and elsewhere, strongly emphasize students' critical thinking and the acceptance or tolerance of a diversity of viewpoints and opinions. It is believed that such outcomes are ultimately for the betterment of society. Nevertheless, there are those who would beg to differ. After all, every country, culture or society has certain beliefs, dispositions, and views of the world that are critical to its identity and sustainability. These are the "things" that make it distinct from other countries, cultures, and societies. We often hear of the importance of maintaining cultural history and indigenous knowledge. Indeed, in some countries (e.g., South Africa), indigenous knowledge is a required component of the school curriculum. In short, cultural history and indigenous knowledge are often valued as helping to sustain the nature and identity of any culture.

As teacher educators we find ourselves in a precarious position. We perennially experience the constant tension between what we try to foster in our preservice teachers at the university and the reality of schools and the school culture they will eventually enter. Although we would like our future teachers to be change agents, we cannot in good conscience prepare our future teachers for a virtual reality. In the end, teachers have less freedom than we would desire, but the government and parents financially support our schools and they must have their say in what is taught and how it is taught. Relative to the focus of this editorial, whether we view the role of teaching as a governmental mechanism to preserve the values, knowledge, mores, and world views that make our society and culture distinct or whether we believe that helping students develop free thinking and critical thinking skills enhances and improves our society and culture is of critical importance. As much as we support the latter view, Norman remembers his early years as a biology teacher in Eureka, Illinois and some parents' complaints, as portrayed by some of their sons and daughters. The complaint was that his students consistently questioned what their parents said instead of just believing whatever was said. These questions were not with respect to rules of the household, etc., but rather about personal and societal issues. Indeed, questioning the veracity of what elders or

your teachers say, in some Asian countries, is frowned upon. One must always respect the views of the society elders. It is interesting that the questioning of “authority” is a supposed mainstay of science. In the end striking a balance between the two tensions of preserving our cultural identity and helping students become free and critical thinkers, and tolerant of diverse viewpoints and opinions is probably best. Why can’t we do both simultaneously?

As diverse as our country is (and the U.S. is not an anomaly), our views about this diversity has become quite clear in this year’s election cycle. By now, the election has been decided, and how the U.S. responds to our diversity will no doubt be affected. How the role and function of a teacher is perceived may change as well. As well seasoned science teacher educators, we hope that our colleagues will side with the views of Bertrand Russell so eloquently written almost 80 years ago. Yes, we can preserve what we value in our culture simultaneously with honoring and appreciating the diversity that we have. Indeed, it is our diversity, more than anything else, that provides the cornerstone of our country and culture. Additionally, as science teacher educators, let us not forget Bronowski’s (1956) view that there is an intimate relationship between the valuing and appreciation of the values of science and the society in which we live.

## References

- Bronowski, J. (1956). *Science and human values*. New York, NY: Harper and Row.
- Commission on the Reorganization of Secondary Education. (1918). *Cardinal principles of secondary education Bulletin 1918, No. 35, Department of the Interior, Bureau of Education*. Washington, DC: U.S. Government Printing Office.
- Green, T. F., Ericson, D. P., & Seidman, R. H. (1980). *Predicting the behavior of the educational system*. Syracuse, NY: Syracuse University Press.
- Mackenzie, J. C. (1894). The report of the committee of ten. *The School Review*, 2, 146–155.
- Russell, B. (1940). The functions of a teacher. *Harpers Magazine*, June, 11–16.
- Russell, B. (1950). *Unpopular essays*. New York, NY: Simon and Schuster.