Implications of Successful Training of Expert Performance in the Design of K-12 Education

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General education (K-12) has been designed to give students general skills and knowledge for continuing college education and professional training in order to become successful adults and responsible and productive citizens. In contrast, the development of expert performance in domains, such as music, ballet, chess and sports, train children, adolescents and young adults to excel in a specific domain. Virtually all individuals, who continue training with teachers during their adolescence, become skilled performers in the corresponding domain while also attending school (K-12) during their childhood and adolescence. It is therefore interesting to make comparisons between the two types of systems of education and training.

In domains of expertise it is possible for beginners, including children, to be able to view the achievements of experts demonstrating superior performance in the domain. During the development of their performance, children and adolescents get the opportunity to perform publically for audiences and in competitions and can thus experience how their performance increases and starts resembling experts. Many students in a domain of expertise, such as music, ballet and sports, work one-on-one with a teacher, who observes their current performance and designs training activities, so they can go off and improve specific aspects of their performance by engaging in training activities with immediate feedback and opportunities for refinement by repetition (deliberate practice). It is also recognized that deliberate practice requires full concentration and can only be sustained for a limited time. For beginners in a domain of activity it is recommended that this type of practice be limited to 15-20 minutes per day, but over several years of practice with increased skill it is possible to gradually attain daily practice schedules of 2-5 hour duration. With teacher-

led individualized training children, adolescents and young adults can keep improving their performance in the domain.

In contrast, general education (K-12) is quite different. Most of the educational goals involving developing general abilities in mathematics and reading as well as general knowledge in history, civics, and the sciences. The vast majority of classroom instruction is conducted by a one teacher working with a group of students ranging from 15 to 30. There are therefore limited opportunities for the teacher to work with students one-on-one. As a consequence, the focus of teachers is on having all students attain minimal proficiencies. There are academic domains that involve public performance and competitions, such as Spelling Bees, and competitions in Mathematics and Science. Research on the top performers at these competitions show that they acquire their superior performance by individualized training activities (Ericsson & Pool, 2016) consistent with the training activities observed in the traditional domains of expertise, such as music, ballet, and chess. The majority of students do not experience the process of attaining high levels of objective performance in a particular academic or a more traditional domain of expertise. General education (K-12) provides students opportunities to become good at rapidly acquiring some introductory knowledge about a new subject, but the curriculum does not guide them to develop deep skills and knowledge and a level of mastery in at least one or two particular domain. As a consequence, these students are not well prepared to acquire high levels of skill in the profession after their completed general education. They do not have personal experience of working with a teacher for years and the need to acquire representations for reasoning, planning and evaluation of their performance, and thus cannot draw on this knowledge when they start their careers and during their continued professional development over their life-long career.

The recent research on expert performance (Ericsson, 2014; Ericsson & Pool, 2016) has found that the acquisition of a beginning level of performance is qualitatively different from those mediating the acquisition

and refinement of mental representations and skills mediating mastery and higher-level performance in the same domain. It is therefore important that every student, as part of their childhood and adolescent experience, attain mastery of one or two particular domains and the associated mental representations that permit them to plan and reason about their performance, and to evaluate and monitor their performance during training and public demonstrations. There are a few different ways that students can acquire this type of experience.

First, students can be encouraged to start getting involved in appropriate domain activities outside the K-12 environment. Appropriate domains will provide a teacher, who can guide and monitor the development of performance and also encourage parents to help monitor the students concentration during individualized practice, especially for young children and beginners. It is essential that the child and adolescent is encourage to reach a sufficient depth of understanding of the domain that is associated with individual mastery and the ability to develop their performance independent of teachers. It should also be possible to develop opportunities for deep mastery of various activities within the K-12 environment. Especially with new opportunities provided by the internet it should be possible to help students develop their skills as writers, as amateur scientists, as painters or graphical designers or as programmers. Several schools are proposing setting aside several hours a week of school time for individualized projects. As long as students are encouraged to develop depth of understanding and elevated objective performance in some particular domain of activity by pursuing increasingly advanced projects in a particular domain they should be able, with the support of teachers, to reach a high level of mastery in that domain.

The general recommendation is to avoid encouraging students to search for their innate gifts by superficially sampling many types of activities. Instead teachers and parents should guide students to acquire an advanced level of performance in at least one activity by providing individualized training and emotional

support. This experience of having attained mastery in one domain will help them to adopt the same approach and methods when they acquire professional skills in adulthood.

References

Ericsson, K. A. (2014). Why expert performance is special and cannot be extrapolated from studies of performance in the general population: A response to criticisms. *Intelligence, 45,* 81-103. http:dx.doi.org/10.1016/j.intell 2013.12.001

Ericsson, K. A., & Pool, R. (2016). *Peak: Secrets from the new science of expertise.* New York: Eamon Dolan Books/ Houghton Mifflin & Harcourt.