# Digital Tutors Accelerate Acquisition of Technical Expertise

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IDA and the National Academies of Sciences, Engineering, and Medicine held a half-day workshop on October 26, 2017. The first of two workshop panels discussed the history and use of digital tutors. The second panel explored whether digital tutor technology is now ready to use in advancing the skills of the nation's technical workforce. The consensus of workshop participants was that the technology is indeed ready for wider and more routine use.

Research into this technology has been advancing since the mid-1960s. Recent IDA assessments of the Defense Advanced Research Projects Agency (DARPA) Digital Tutor suggest a technological breakthrough that provides exceptional results. For example, consider the effectiveness of the DARPA Digital Tutor for training U.S. Navy Information Systems Technology (IT) specialists. In a recent assessment, IDA compared the skills and knowledge acquired by three groups, each consisting of twelve Navy sailors. One group completed 16 weeks (the usual course length) of Digital Tutor training, the second group completed 35 weeks of Information Technology Training Continuum coursework, and the third group consisted of Navy IT specialists with an average of 9.2 years of fleet experience.

IDA assessed these groups' IT capabilities on the basis of 6 hours of troubleshooting skill testing and 4 hours of written knowledge testing and found that the Digital Tutor graduates attempted and solved more problems than either of the other groups (figures). Results indicate that 16 weeks of Digital Tutor training increased the skill and knowledge of new recruits well beyond those of even seasoned Navy IT specialists.
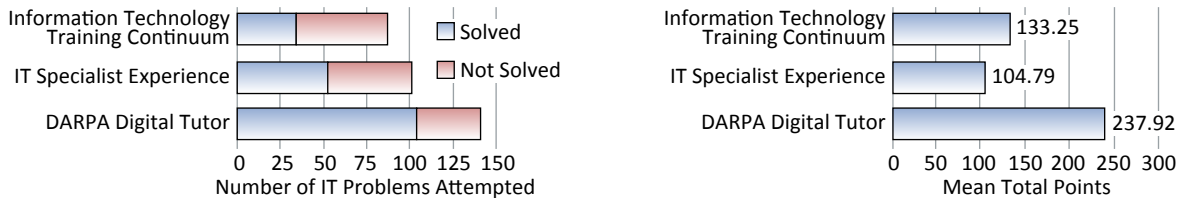
In another example, the Veterans Administration used the DARPA Digital Tutor to prepare five cohorts of twenty veterans each for civilian employment in IT. The participating veterans (91 men and 9 women) had all been honorably discharged from the U.S. military. Other characteristics of the veterans were as follows:

Average Age	Average Years of Service	Average Years of Separation	Only High School or GED Diploma	Military IT Training	Civilian IT Education	Employed (Full/Part Time)
30.5	5.6	5.2	45%	4%	8%	11%/17%

Of the 100 veterans who began the training, 97 completed the 18-week course, and the 86 participants who sought jobs averaged annual entry salaries of $73,000 in confirmed IT positions. This salary is equivalent to that typically received by IT technicians with 3 to 5 years of experience.

Panelist Lt. Gen. Gina M. Grosso (second from left) indicated that the Air Force is assessing the use of digital tutors in training.

The success of these and other examples of digital tutoring is attributable to advantages digital methods have over traditional methods. One advantage of digital tutors is that, like human tutors but unlike classroom instructors, they can precisely tailor instruction in real time to the background, needs, and learning abilities of each learner. Another advantage is the immense store of information and data immediately accessible to digital tutors via cloud or local storage. Machine intelligence is needed to quickly choose which information and data to provide for which learners and how to present it.

Workshop participants explored how to get digital tutoring to the personnel in technical sectors most in need of advanced skills. Panel participants concluded that established results of digital tutoring suggest it can substantially increase efficient use of time and resources for training skilled technical workers in the military as well as in other sectors.