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# COMPLEX PERFORMANCE REQUIREMENTS OF MODERN JOBS AND PROFESSIONS

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The emergence of a global information economy has dramatically changed the requirements for an effective American work force. Where once workers simply needed to be literate, competent in very basic mathematics, able to follow instructions, and able to show up on time, today those capabilities are generally available from computers and robots. Indeed, the very tools we historically used to design effective schooling and training are also used today to design software to do jobs previously available to people.

Consequently, both schools and businesses need to learn how to prepare people for positions that cannot efficiently be filled with automata. Schools, in particular, need to focus on developing the ability to confront and solve novel problems (not the standard forms for which one can cram the night before but truly unexpected ones), to quickly learn new jobs and roles, to work collaboratively, and to interconnect and understand bodies of knowledge and viewpoints that have very different underlying bases in experience. Businesses need to learn how to train workers for new roles quickly and effectively when those roles require the ability to respond to novel and emergent situations or to understand a situation from several different points of view (e.g., providing technical customer support for a product or fielding queries from medical insurance customers).

When the stakes are high enough, we do prepare workers at this higher level. Physicians, football players, and pilots, for example, are taught to deal with the unexpected, to collaborate, to keep learning efficiently, and to connect different bodies of knowledge. The generic approach found in these high-stakes areas is learning by doing, with opportunities after performance to reflect on how things went and how they can go better next time. This approach has been demonstrated to be extremely effective as well in training electronics technicians to deal with unexpected and unique failures of complex equipment. Indeed, intelligent computer systems have been built that can provide this kind of preparation. American competitiveness could be improved dramatically by developing a richer, more readily deployed, and empirically validated technology for designing both worker training and schooling that focuses on the newly needed capabilities of a world class work force.

Some of the tasks that remain in this area include:

- Better procedures for knowledge acquisition for training development
- Clarification of how to deal with different kinds of learning (simple associations, rules, complex knowledge-based inference)
- Better explanation of the intelligent tutor building process to both instructional designers and software developers
- More complete and integrated tool kits

## REFERENCES

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