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ABSTRACT

Military personnel facing forced retirement are prime candidates for retraining as teachers. As mature adult learners, retiring/retired military personnel have certain needs that must be addressed if they are to become successful in their educational careers. Knowles' six assumptions of andragogy acknowledge these special needs as follows: adults need to know why they need to learn something before they start learning it; adults learners have a self-concept of being responsible for their own decisions and lives; adults bring a greater degree of varying experiences into the classroom than younger students do; adults become ready to learn when forced to deal with their real-life situations; adults are life centered in their orientation to learning; and motivation of adult learners can become an issue because of such factors as negative self-concept and inaccessibility of opportunities, time constraints, and programs that violate the principles of adult learning. Unlike traditional classroom techniques, high fidelity computer-based simulations are well suited to andragogy-based teaching techniques. Such simulations are intrinsically motivating, and they give adult learners a simultaneously self-directed and collaborative approach to teacher training programs. (Contains 13 references.) (MN)

"Using High Fidelity Computer-Based Simulations In Retraining Of Retired Military Personnel"

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Abstract

There is a growing need to address the training of retired military personnel for employment as classroom teachers in public education settings. High fidelity simulations have proven effective in increasing competency and building necessary skills in many areas of business and the military. This paper will discuss future applications in teacher training that promise to support educational theory into practice, while allowing the more mature student (e.g., retired military personnel) to develop the necessary skills in a setting other than the traditional undergraduate classroom.

"Using High Fidelity Computer-Based Simulations
In Retraining Of Retired Military Personnel"

Military personnel recently facing mid-life crises (e.g., forced retirement) are prime candidates to be trained as teachers for the public schools in North America. These more mature candidates are at a stage in their development that seems particularly adaptive to teaching—whereby their "generative needs imply both the support of children . . . and the nurturance of young adults" (Jones & Petry, 1980, p. 63). One tool that promises to enhance the teacher training process for retired military personnel is high fidelity computer simulation. Such simulations give the more mature teacher candidate a self-directed, yet, at the same time, collaborative approach to teacher training programs.

Andragogy And Simulations

Adult learners, versus their younger counterparts (i.e., teenagers entering college), have certain needs to be addressed if they are to become successful in their educational career. Andragogy is the theory of learning based on adult learners' needs. Knowles' (1990) six assumptions of andragogy describe differences from typical pedagogical assumptions.

Assumption number one states that adults need to know why they need to learn something before they start to it. Simulations are one way that adult learners can define why they need to learn something before they embark on a particular direction. "[P]otent tools

for raising awareness of the need to know are . . . simulated experiences in which the learners discover for themselves the gaps be' ·veen where they are now and where they want to be" (Knowles, 1990, p. 58).

Assumption number two states that adult learners have a self-concept of being responsible for their own decisions and for their own lives. These mature learners resent others imposing their will on them. Simulations imply self-directed, self-deterministic ways of learning by doing. The learner is not imposed upon from outside the simulation, but from an inherent part within the simulation called *feedback*, the interaction of the individual's actions and the simulation's reaction. Feedback gives the adult learner the ability to see interrelationships, not always apparent outside the simulation exercises (Nelson, 1993a). The learner can then focus on types of structures that reoccur again and again in repeated simulation exercises, giving the learner a sense of self-direction in the learning process.

Assumption number three is based on the role of the learner's experience. Adults have a greater degree of varying experiences they bring into the classroom than their younger counterparts. Knowles (1990) has determined that:

> [F]or many kinds of learning the richest resources for learning reside in the adult learners themselves. Hence, the greater emphasis in adult education on experiential techniques—techniques that tap into the experience of learners, such as . . . simulation exercises—over transmittal techniques (p. 59).

One problem associated with the greater amount of experiences of adult learners is the potential for greater amounts of bias. High fidelity simulation can help adult learners to examine their own belief systems in productive ways (Nelson, 1993a). Simulations can deliver diverse settings that would be hard to address in traditional and/or homogenous classroom settings. Such diverse settings would force the mature learner to "see" their bias in context with others and determine if the outcome was, indeed, warranted. Byrnes and Kiger (1992) suggest that simulations "may be one avenue for sensitizing participants to the unequal treatment of many groups in our society and requiring participants to rethink their own beliefs about group differences" (p. 467). They suggest that simulations can identify prejudice as an issue so that stereotyping, for example, becomes a problematic issue rather than a taken-for-granted phenomenon, and, therefore, becomes more difficult for a participant to discount.

Assumption four in the androgogical model deals with readiness to learn. Adults become ready to learn when they have to deal with their real-life situations. Knowles (1990) states that simulations can help to induce adults to readiness, using developmental tasks associated with moving from one developmental stage to the next within the simulation exercise.

Assumption number five states that adults are life-centered in their orientation to learning. They want to apply what they learn to situations in their lives. Simulations can give adult learners the chance

to become "test pilots" as decision makers and actually "crash" possible solutions simulated in realistic environments before they apply said solutions in real life (Nelson, 1993b).

Assumption number six states that motivation of adult learners can be an issue, especially with such factors as "negative self-concept as a student, inaccessibility of opportunities or resources, time constraints, and programs that violate principles of adult learning" (Knowles, 1990, p. 63). High fidelity simulations are intrinsically motivating to the point that it can be hard to stop simulation exercises after the learner becomes engaged.

One reason for this is the visual aspect of simulations. Visual learning is a more effective way to present material, especially in the television generation from 1950 on. Picard (1990) states that the "American population has changed from verbally literate to visually literate" (p. 5). He goes on to state that the sophistication of today's audience determines a visual approach to presenting information. Brody (1993) describes how museums' most popular exhibits are the "interactive" kinds—one that have buttons that are connected to action events in the displays. Norman (1993) writes that simulations are stimulating and compelling because they are "event-driven activities, always presenting some new challenge to the [learner], maintaining attention by continual new stimulation, new challenges" (p. 35).

Second-Order Effects Of Simulations

Besides reinforcing the six assumptions of andragogy, simulations can provide for other areas in the mature learners' development through the second-order effects of simulations—maybe even more compelling than the first-order effects popularized by the literature. Norman (1993) describes how high fidelity simulation brings about an opportunity for the participant to master two relevant modes of cognition, *experiential* cognition and *reflective* cognition:

> Simulated experiences have the potential to become powerful instruments of cognition. They support both experiential and reflective processes: experiential because one can simply sit back and experience the sights, sounds, and motion; reflective because simulators make possible experimentation with and study of actions that would be too expensive in real life. (p. 205)

In experiential cognition, the participant's skills can be developed and refined to the point of automatic reflexive action during the simulation (e.g., an airline pilot practices the proper responses for quick, effortless emergency strategies in keeping a 747 out of trouble during a flight simulation session). In reflective cognition, the participant's reasoning and decision-making skills are developed and refined to the point that reflective thought can be automatic before and after simulation sessions (e.g., an educator successfully predicts and thoughtfully critiques the outcomes of new culturally sensitive strategies used during a microculture simulation session).

Meyers and Jones (1993) report seven skill areas that can be developed and practiced using simulations: general skills (e.g.,

nonverbal communication), specific skills (e.g., monitoring and adjusting instructional delivery), team skills (e.g., group decision-making), problem-solving skills (e.g., a social science experiment), synthesizing skills (e.g., a multicultural problem discussed in class, but not in the text), basic empathic skills (e.g., imagining the woes of an HIV-positive student), and advanced empathic skills (e.g., reversing roles of students from different cultures in a diversity exploration simulation).

Hass and Parkay's (1993) findings support the apparent benefit of increasing interpersonal skills between team members involved in simultaneous simulation exercises. In simulation sessions of the M-1 tank, the U. S. Army reported that during simulated stressful conditions groups of simulators were as useful for teaching teaming skills as they were for teaching the mechanics of tank operation. Barrett (1993) argues that the computer can become the "vehicle for sharing work" (p. 52). He describes how a majority of students surveyed preferred the intellectual questioning promoted by electronic classroom applications (e.g., simulations) then the "single-minded focus on assignments and due dates in conventional teaching" (p. 54).

The impact of second-order effects in high fidelity simulations are being identified as more compelling than the original motives behind the development and implementation of simulations in the first place. These second-order effects (Papert, 1993) are, arguably, "less specific but more powerful role[s]: By entering the culture of the school

it [simulations] can weave itself into learning in many more ways than its original promoters could possibly have anticipated" (p. 53).

Simulations In The Classroom

The traditional classroom setting does not lend itself to "good" andragogical techniques. However, a learning laboratory consisting of high fidelity simulations, where constructed representations of real-life settings are used for real-time experimentation by individual students working together on improving practices, is one of the most promising instructional techniques available in teacher training today, especially for the specific needs of mature learners (e.g., retired military personnel). The first-order effects of simulations (e.g., self-motivating, risk-free, dynamic interaction) are apparent and compelling. The second-order effects (e.g., reinforcing interpersonal, and decision-making skills, increasing relevant modes of cognition) might be of even greater importance as more research into this new arena of teacher training is reported. Senge (1990) says it best:

> We all learn best from experience, but we are unable to experience the consequences of many important organizational decisions. Learning laboratories remove this constraint through system dynamics simulation games that compress time and space. (p. 21)

Simulations are going to be one of the most powerful tools ever used in training of teachers. Retired military personnel will be one of the groups of teacher candidates that will use the potential of simulations to its fullest. Those who will prosper most will be students.

REFERENCES

Barrett, E. (1993, February/March). Collaboration in the electronic classroom. Technology Review, 96(2), 51-55.

Brody, H. (1993, November/December). Video games that teach? Technology Review, 96(8), 50-57.

Byrnes D. A., & Kiger, G. (1992). Prejudice-reduction simulations: Ethics, evaluations, and theory into practice. Simulation & Gaming, 23, 457-471.

Hass, G. & Parkay, F. W. (1993). Curriculum planning: A new approach (6th ed.). Boston: Allyn and Bacon.

Jones, P. L. & Petry, J. R. (1980). Evaluation of state adult basic education. Memphis: Memphis State University.

Knowles, M. (1990). The adult learner: A neglected species. Houston, TX: Gulf Publishing Company.

Meyers, C. & Jones, T. B. (1993). Promoting active learning: Strategies for the college classroom. San Francisco: Jossey-Bass Publishers.

Nelson, J. O. (1993a). Computer simulation (microcultures): An effective model for multicultural education. Paper presented at the annual International Society for Educational Planning meeting. September 30-October 2. Niagara Falls, NY.

Nelson, J. O. (1993b, Summer). School system simulation: An effective model for educational leaders. The AASA Professor, 16(1). 5-7.

Norman, D. (1993). Things that make us smart: Defending human attributes in the age of the machine. Reading, MA: Addison-Wesley Publishing Company.

Papert, S. (1993). The children's machine: Rethinking school in the age of the computer. New York: BasicBocks.

Picard, D. (1990, September). Desktop training presentations. Training, 27(supp. 19), 5-8.

Senge, P. (1990). The leader's new work: Building learning organizations. Sloan Management Review, 32(1), 7-23.