

Refereed Article

Some Implications of Life Span Developmental Psychology for Adult Education and Learning

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Abstract

Many adult educators do not consider developmental psychology relevant to adult education because the bulk of developmental theory offers little for practical application. This paper describes a different perspective of adult psychology—life span developmental psychology—which holds great promise for educators in understanding better adult learning. We attempt to make explicit and to strengthen connections between developmental theory and adult education practice and describe three research traditions in adult development that can inform adult education. These include psychometric studies tracking gains and losses in intellectual functioning over the life span, studies of everyday cognition and adaptive competence, and theoretical descriptions of post-formal styles of adult cognition. We integrate these diverse perspectives on intellectual development and derive several implications for adult education. Evidence from life span developmental psychology leads us to conclude that the most effective adult learning occurs when instruction matches real-life applications within learners' social contexts.

Introduction

Most textbooks in the field of adult education describe theories of adult development and admit their importance in understanding the needs

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of adult learners (e.g., Merriam & Caffarella, 1998; Smith & Gallagher, in press; Tennant, 1997). However, how developmental theory is used in adult education teaching practice is often unclear. One viewpoint maintains that adult educators are removed from adult developmental research and do not utilize sufficiently available resources that inform instruction. Research into adult development is usually not done by adult educators, but by psychologists, and there has not been, until recently, systematic collection of adult development research that can assist adult educators. While some (e.g., Courtenay, 1994) contend that the developmental literature is irrelevant to adult education practitioners, others (e.g., Taylor, 1996; Tennant, 1997) argue that when adult educators understand developmental theory, they are able better to understand and assist their students.

In this paper we suggest that a life span developmental perspective can be of great value to adult educators. The applications of this perspective should be apparent because of its consistency with existing practices of adult education. The learning theories in the field (Knowles, Holton, & Swanson, 2000) and good practices intuitively used by adult educators (Merriam & Caffarella, 1998) are consistent with the conclusions of life span developmental psychology. We highlight briefly the relevant theory and research on life span psychological development and then describe some practical applications of this work to adult education.

An Overview of Life Span Developmental Principles

In contrast to many traditional stage theories of psychological development (e.g., Erikson, 1982; Kohlberg, 1973; Levinson, 1986), life span development forms a “family of perspectives” (Baltes, 1987) rather than a single, unified theory. Emerging from these perspectives, three closely related research traditions predominate the field. These are (a) psychometric research on cognitive gains and losses over the life course, (b) studies of everyday cognition and intelligence in real life contexts, and (c) extensions of Piagetian cognitive structuralism to adult stages of postformal operations. While this research is somewhat theoretical in nature, the findings can be applied to the practice of adult education.

Psychometric Research

Life span developmental psychology in the psychometric tradition is probably best represented by the extensive research and theory development of Baltes and his associates (Baltes, 1987, 1993; Baltes & Baltes,

1990). Baltes (1987) summarizes the theoretical perspectives of life span development as follows: Ontogenetic development continues through the entire life span; is multidirectional, with some developmental systems showing increases and others declines; and consists of joint occurrences of gains and losses. Further, there is much intra-individual plasticity in development, and development varies in accordance with historical-cultural conditions. Thus, human development is contextual and dependent on the dialectical interaction of age-graded, history-graded, and non-normative influences. Baltes suggests that psychological development can be understood best through a multidisciplinary lens—an invitation, perhaps, to adult educators to contribute in advancing the field.

Longitudinal studies of intellectual development throughout adulthood offer much insight into the learning processes of adults. One of the most extensive and comprehensive studies conducted to date is the Seattle Longitudinal Study, begun by K. Warner Schaie in the mid-1950s (Schaie, 1996). His data showed little decline in individuals' cognitive scores over time until very late in life. There is no significant decline until age 74.

Important discoveries have also been made in the nature of the components of intellectual functioning. *Fluid intelligence*, the basic “hardware” of the information-processing system, is described as the “pure” ability to perceive, remember, think, and process information based on the functioning of the central nervous system (Horn, 1970). While fluid abilities have long been assumed to decline with age after early adulthood, this decline has little functional impact until late in life. *Crystallized intelligence*, a component of the pragmatics of the intellect (Baltes, 1987), is described as the incorporated knowledge valued by the culture (Horn, 1970). It remains stable or even increases throughout the life span until very old age. Older adults may experience declines in memory, speed of processing information, and pure analytical abilities (i.e., fluid intelligence). They can, however, compensate for these losses by increasing their skills in communication, verbal abilities, practical judgment, enhancement of social relationships, acquiring knowledge through experience and specific expertise, and problem solving skills (i.e., crystallized intelligence). More recent studies show that even fluid abilities may not decline whenever higher levels of expertise are attained in particular domains of knowledge (Masunaga & Horn, 2001).

Thus, adaptations to biologically-based slowing of some intellectual functions may be compensated for among adults whose cognitive skills are highly practiced. Baltes and Baltes (1990), for example, demonstrated

that cognitive functioning in old age can be enhanced through memory training—although there are limits to this training. Uses of adaptive strategies that Baltes and Baltes refer to as “selective compensation with optimization” enable adults to extend their existing abilities. They cite an example from pianist Artur Schnabel, who was able to continue concert playing well into his 80s by performing fewer musical pieces (selection), practicing them longer (compensation), and playing at a slower tempo to create more contrast between slow and fast movements (optimization).

Everyday Cognition

Studies of everyday cognition, or practical intelligence, within the social and cultural context stress that all learning is social and cannot be seen as merely an inter-individual phenomena (Rogoff, 1984). Attentiveness to context is certainly applicable to the practice of adult education, which occurs in a variety of settings and relies on the contextual knowledge of adults and their cultural experiences. A number of studies of practical cognitive functioning have been carried out in real-life situations (Henze, 1992; Lave, Murtaugh, & de la Rocha, 1984; Scribner, 1984; Sternberg & Wagner, 1986). An important outcome of these studies is the understanding that cognitive performances in real-life situations and meaningful contexts, such as classrooms or the workplace, are often quite different from the cognitive functioning induced in a laboratory setting where learning tasks are contrived and “artificial.”

Postformal Thought in Adulthood

Many developmentalists view the adult years as having the potential for higher level cognitive structures than those found in adolescence (Sinnott, 1984). Several theorists have proposed stages of cognitive structures or general cognitive abilities unique to adulthood. These cognitive structures go beyond Piaget’s (1970) final stage of formal operations, and these postformal theories describe dialectical (Basseches, 1984; Riegel, 1976), relativistic (Sinnott, 1984), problem-finding (Arlin, 1984), and metacognitive (Commins, Richards, & Armon, 1984) forms of thinking. A common feature of these theories is a rejection of formal operations as the final stage of cognitive development. Postformal thinking involves understanding and reconciling contradictions (Sinnott, 1984), engaging in problem-finding rather than problem-solving (Arlin, 1984), seeing relativistically across multiple systems of organization rather than within a single system (Basseches, 1984), and understanding multi-causality rather than single causal factors underlying perceived effects (Commins et al.,

1984; Rybash, Hoyer, & Roodin, 1986). These understandings enable mature thinkers to exhibit skills in interpersonal relationships, practical judgment, creative endeavors, and wisdom. Not all adults exhibit postformal thinking abilities. Many adults frequently do not use formal operational skills. Still, there is empirical evidence for the widespread use of postformal thinking styles in adulthood (Armon, 1984; Sinnott, 1984). These many modes of adult thought are qualitatively different from the forms of thinking found at earlier ages. To the degree that postformal thinking occurs, it is a function of mature adult thought.

Integrating Adult Developmental Perspectives

While the studies of life span development, psychometric research on intelligence, everyday cognition, and postformal structures of adult thought each view adult development from somewhat different perspectives. Findings from these studies can be integrated to draw several conclusions that can be applied to adult learning and the practice of adult education:

1. *The trajectory of adult intelligence is multi-directional.* While some declines occur with aging in the fluid mechanics of intelligence, some fluid abilities may also be maintained in areas of high-level expertise. There are also corresponding increases in pragmatic, or crystallized, intelligence. Thus, adults have an advantage over younger learners in understanding the rich, experienced-based knowledge of the culture. It can therefore be expected that adults are well prepared to master the activities relevant to adult education programs.

2. *Adult cognition tends to be highly contextual and domain specific.* Adults demonstrate adaptive and compensatory abilities by utilizing experience-based cognitive strategies and developing expertise through practice in specific domains. Reliance upon one's expertise and experience enables adults to function effectively in many adult education settings.

3. *Adults are capable of higher-order thinking and use of cognitive structures that are unique to adulthood.* Postformal theory and research show that adult thinking may be relativistic, dialectical, metasystematic, and generative (i.e., problem finding) in nature. These qualities allow adults to excel in interpersonal relationships, social knowledge, practical judgment, creative endeavors, and the development of wisdom.

Perhaps an overall theme of research on adult cognition can be summarized by saying that *adult thinking functions most effectively when it is*

experienced-based and within specific social contexts. This characterization can be seen in work applications, social situations, cultural functioning, and interpersonal relationships. Whereas younger learners might excel in the grasp of abstract concepts, cognitive processing speed, and memory proficiency, adult learners excel in the real-world, experience-based applications of learning. While this statement is intuitively obvious to experienced adult educators, it is important to link theory and research to the practice of adult education if it is to become more effective.

Applications of Adult Developmental Psychology to Adult Learning

Adult learning happens continuously, in both formal and non-formal settings. In fact, much adult learning occurs in unintended ways (Pressley, McDaniel, Turnure, Wood, & Ahmad, 1987) or as self-directed learning projects (Tough, 1979) carried on without teaching assistance. This natural learning takes place quite adequately without help from psychologists or educators and will not be addressed here. Rather, the field of adult education generally focuses on applications of formal or institutional programs.

All aspects of the formal practice of adult education should incorporate knowledge of adult cognitive development. Specifically, educational efforts will be most effective when they incorporate the three concepts of adult cognitive development discussed earlier. An organized program of adult education should consider that (a) the trajectory of adult intellectual development is *multi-directional*, with both gains and losses (Baltes, 1987); (b) adult cognition is *highly contextual and experience based* (Rybash et al., 1986; Scribner, 1984; Sternberg, 1997) and (c) adult modes of thinking exhibit unique *postformal styles* (Commons et al., 1984). Adult instruction happens best when it acknowledges the strengths and weaknesses of adult cognition and emphasizes the skills and experiences of adulthood. Applications of these principles to adult education in the areas of curriculum, teaching strategies, student evaluation, and program development are likely to lead to more effective instruction and learning.

Curriculum

Adult education curricula, regardless of setting, must be relevant to the experiences of older learners. Some environments where learning occurs, such as workplace training programs, are relevant by their very nature (even if lacking other components of effective educational strate-

gies). Learner application is obvious, as job retention or advancement may be an outcome of educational or training success. Classes in other settings, such as community-based non-credit courses, seminars, or self-improvement workshops, literacy skill development, hobbies, or general interest are dependent on an existing high interest level for adults' self or vocational development. The one area of adult education that is most institutionalized and formal—higher education in schools, colleges and universities—is often the least receptive to adults' needs for relevance, application, and congruence with their cognitive styles and strengths.

An excellent example of the incongruity of formal educational requirements and learning needs of adults is provided by Schlossberg, Lynch, & Chickering (1989). They point out that, in formal college programs, one of the most difficult areas for older adults to master is mathematics. They propose specialized math learning labs to help adult learners through these difficult courses. While this is certainly a valuable suggestion, we might take the apparent difficulty of adult learners with mathematics a step further and see it as an opportunity to apply the principles of adult cognitive development. First, mathematics, in its abstract form as found in formal instruction, emphasizes fluid cognitive abilities that decline with age. Pure mathematical reasoning requires very little crystallized or pragmatic intelligence. Second, math, as taught in college courses, is usually devoid of meaningful context and not grounded in past experience or the learning domains of the individual. Third, mathematics require abstract logico-mathematical formal reasoning, a form of logic that many adults may use less frequently, having found it insufficient in dealing with the complexities, contradictions, and ambiguities of life. As post-formal cognitive thinking styles often have replaced the more logical and analytic processes used in mathematics, adults often lack the motivation to strive to acquire these skills.

Do these circumstances imply that adults are not capable of mathematical reasoning or college-level mathematical performance? Certainly not. Various studies have demonstrated the competence of dairy workers (Scribner, 1984) and grocery shoppers (Lave et al., 1984) in solving difficult math problems when the problems are situated in real-life, meaningful contexts. Adults are quite capable of not only competence, but expertise, within experienced-based cognitive domains. However, some adults may have difficulties with abstract concepts and skills that do not have obvious life-relevance and application. If the concepts and skills of math are linked effectively with past experience, present career and life situations, and perceived future needs, many learning difficulties can be minimized and some learners will thrive.

What constitutes a relevant curriculum for adult learners in higher education? Our understanding of adult development certainly precludes the accumulation of unrelated facts and theories in abstract fields removed from life experience as a relevant and effective framework for adult learning. Programs need to be developed that begin with the current skills, interests, knowledge, and cognitive strengths of adult learners. These programs need to address the current and future needs and goals of the learner. This undertaking is not an easy task, as not only do adults differ qualitatively from younger students, but, as individuals age, they become increasingly differentiated within their own cohort group (Schlossberg et al., 1989). Nevertheless, a number of methods have been devised to deal with varying individual experience bases. Some possibilities include individualizing courses of study; offering credit for prior learning and life experience; internships and field experiences; self-directed learning programs, including on-line courses; and structuring courses so that they are practitioner based and emphasize applications of theory to practice.

Instruction

Effective instructional methods within a particular course will parallel the needs discussed in the planning of the overall curriculum. Adult educators know that older students are able to access a rich life-experience base in the learning process. Realizing that adult cognition tends to be domain specific, effective teachers will use this experience as specifically as possible to provide examples, present problems and questions, and connect with theory. The specific expertise of learners can also be used as a valued resource in virtually any class.

Adults' attainment of comparatively strong, crystallized knowledge structures gives them good command of culturally based knowledge, verbal ability, social skills, and interpersonal judgment. In utilizing these attributes, adult teaching should emphasize larger life issues and broad concepts, use verbal and group transmission of information, and provide examples from within the cultural context. Conversely, the relative decline in fluid intelligence argues against the presentation and memorization of lists of factual content, lengthy lectures, and rapid coverage of unfamiliar or highly theoretical concepts, although research has demonstrated that even older adults can be trained to memorize and accurately recall long lists of items (Baltes & Baltes, 1990).

There are some content areas, of course, that demand the exact knowledge of factual information, such as medical and technical fields. In these cases adult learning can be more efficient and less stressful if attempts are

made to link this knowledge with the current knowledge structures of the individuals. Matunaga and Horn (2001) found that even highly fluid cognition is maintained among older adults when the knowledge domain is within their area of expertise. We can think of many expert physicians or professors, for example, who function effectively until very old age. The obvious limitation is that many older individuals might be poorly advised to pursue an entirely new area of knowledge that demands a great deal of technical and factual knowledge, memorization, mental speed, and abstract information processing.

Adult educators must also be aware of the potential for post-formal operational styles of thinking among learners. The cognitive styles identified in the literature involve dialectic, relativistic, meta-systematic, and problem-finding thinking. Rather than being obstacles to learning, these styles present opportunities and challenges to facilitating exciting, meaningful learning. Researchers have connected these styles with such specific skills as judgment in interpersonal relationships, creativity in seeing many possible answers rather than one “correct” conclusion, practical judgment and wisdom in everyday activities, and seeing across multiple systems of thought.

Such qualities make adult learners almost ideal students because of their abilities to function effectively within groups (with enhanced interpersonal skills) and their willingness to participate actively in dialogue and discussion. Adults often are able to view the “big picture” and see many sides to an issue while maintaining their own beliefs and values, having made commitments among many available choices. These diverse cognitive styles enable learners to engage in the type of critical thinking that is often stressed by adult educators (Brookfield, 1991; Mezirow, 1990). In light of these issues, the teaching activities that are least effective involve non-participatory lecturing, presenting only one set of “facts” or one side of an issue, and treating the subject matter as discreet knowledge unconnected with other facets of life. While these all-too-common practices are usually ineffective in teaching children and adolescents, they are barely tolerated by mature adults.

Evaluation

Any proper system of student evaluation should reflect the nature of the coursework, the teaching methods, and the learners. If the above guidelines for adult teaching are followed (such as presentations that are interactive, group focused, and concentrated on broad concepts and immediate application and that incorporate adults’ abilities, skills, and interests),

then learning assessments will be much improved. Studies of everyday cognition provide evidence that adults perform far better in real-life situations than in artificial or contrived test conditions. Objective testing is often less effective in evaluating adult learners because it rarely evaluates their understanding of broad concepts, is removed from actual practice and application, and is biased towards speed of performance and recall. These are not strong attributes among adult learners. More importantly, most objective tests fail to assess performance for the primary purpose for which adults take up education, that is, real life application. The value in assessing adults' learning is to determine that connections are being made between classroom learning and students' lives. Fortunately, most adult education programs stress learning projects, application activities, reflection exercises, biographical papers, or similar applied products as the primary means of evaluation. We encourage the continual refinement in these approaches that will result in valid, appropriate assessments of adult learning.

Program Organization and Administration

Much of the practical work in adult education programs center on program development, course structure and availability, and attention to student recruitment, admissions, and retention. It is in these areas that many of the principles of adult psychological development are often used effectively. Application of these psychological approaches has definite value in connecting potential adult learners with an appropriate educational program, but it does not address their specific cognitive and learning needs. For instance, understanding the "life tasks" (Havighurst, 1976) faced by middle-aged, employed adults might lead the adult educator to develop a weekend learning program that is highly focused and time-limited. Attention must also be devoted to appropriate teaching strategies for such a course. The development of these strategies should draw upon implications from cognitive developmental research findings.

There must be congruity of goals, methods, and strategies between the administration of adult programs and adult learning theory. Individuals who design curricula and teach in adult programs will not be successful if the curricula and teaching methods are not commensurate with the cognitive development of adult learners. Further, program and curriculum design should incorporate those features that will enhance the cognitive abilities of adults, including contextually-based and culturally-relevant teaching methods linked to the experience of learners. Awareness of these attributes of adult cognition can lead to the development of pro-

grams that build upon existing work and career skills, incorporate self-directed learning, feature independent study, and offer credit for life skills. Programs can be developed that use the highly developed social and interpersonal skills of adults. The creation of cohort groups that study and learn together over a significant time period is one example. Learning activities should be interactive with the greater community in order to make effective use of the contextualized skills and life experiences of adults. There are many possibilities for the development of adult education programs, since the field is extremely broad and encompasses learners with many diverse needs. The processes of program management, curriculum development, and instruction, grounded in a thorough understanding of adult developmental psychology, should work in concert.

Conclusion

This paper has described several implications of life span development principles for adult education. Three cognitive research approaches tracing intellectual gains and losses over the life course, everyday cognition and contextual learning, and post-formal styles of adult thinking underscore the need for adult educators to understand and integrate the findings from this research into their practices. In this regard a number of suggestions concerning application of life span principles to areas of program and curriculum design, teaching methods, and evaluation were presented. The adult education literature abounds in theory and methods to enhance adult learning. Adult educators, however, need to make the connections between life span development, adult education and learning explicit in their teaching. The further exploration of the nature of adult cognition should guide the theory and practice of adult education and learning.

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