Play, learning and physical activity

Åsa Harvard 2004
Asa.harvard@k3.mah.se

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ABSTRACT
In Swedish preschools play is considered to have a major importance for children's learning and development. There is also a large body of research on play and learning in preschools and schools. Play methodologies can strengthen motivation, engagement and sense of emotional security in a learning situation. Many researchers point out the shift in understanding play from recreation to pleasurable learning. Other play discourses ? psychological abreaction, cultural expression, fiction ? become overshadowed by the discourse of play as learning and development.
Body, movement and physical activity have traditionally been less valued than cognitive abilities in the educational system, a fact that still permeates the design of both school system and premises. Recent research in neuroscience and other disciplines offers new perspectives on the relationship between motor behavior, cognition and play.
· Studies on animals show that the scheduling of specific play behaviors matches sensitive periods in the development of the central nervous system (performance-dependent development).
· New knowledge of the mirror neuron system points to the amount of neural resources dedicated to understanding others' physical actions, and as a consequence, to the importance of imitation for learning.
· Research on brain plasticity points to how the activities a person engages in actually reshape the brain structure ' also after childhood.
This offers new perspectives both on the possibility to model activities for specific learning or rehabilitation purposes, and to the rationale of 'autotelic' play activities. This field has potential to significant progress during the coming years. It has important implications to issues of both learning and health. The culture of physical inactivity is still present in the design of school and school premises, and future forms of educations such as e-learning remain in most cases in the same paradigm.
Technology changes children's lives an also the conditions for education. Many children are extensive media users from an early age. Media offers virtual play spaces and many occasions for informal learning. The skills used for playing computer games or chatting are in many cases also valuable in a school context.
Within the disciplines of Human-Computer Interaction and Ubiquitous Computing an important research issue deals with the design of computer-based learning environments and artefacts for playful learning. 'Smart toys' help children explore complex mathematical formulas in a hands-on manner. Computer-augmented environments can be designed to support movement and interaction between people and computer systems simultaneously. These design initiatives are still in their beginning, but important to pursue further - especially in view of the amount of time future learners are expected to spend interacting with computers.
Most play theories and play research deal with children, which give them a limited potential when it comes to adults. Play theorists as Huizinga, Apter and Czíkszentmihályi have developed theories that also cover adults' play. These have been used successfully to

understand the motivation and behaviors of adventure tourists. Also within participatory design, play is used to model collaborative design activities. There is reason to believe that many cultural, social and learning activities of 'non-children' could be better understood and designed for using play theory.

Research questions

· Why is play motivating?

The strong motivational factor in play is widely recognized. But wherein lies the motivation? How does motivation relate to the content of play, the form or the social context? Does the motivational factor change depending on the age of the players?

· Metacognition: How do children and adults think about their own learning?

Research points to the importance of self-confidence about one's ability to learn in order to learn successfully. Preschool has a key role in shaping children's understanding of learning and their appreciation of their own learning abilities. What ideas of learning are communicated in preschool? The issue also concerns adults. How do people consider informal learning, as in sports activities or clubbing? Is there a perceived connection between formal and informal learning?

·What are the informal learning processes involved in children?s play and use of media?

How do oral culture, mass-media content, peer pressure, motivation, and self-image contribute to childrens informal learning in play and trough the media? What is the rationale of children's preferences in informal learning?

·How and why do adults play?

The research on play focuses almost exclusively on children and play. Adults play too - in sports, in gambling, with their mates, through daydreaming, through participation in festivals and in many other forms. Huizinga and others point to the importance of communities in play ? and that the play communities often have influence far beyond the play situation. Ethnographic research on adult play could contribute to understanding of and design for learning and leisure activities for grown-ups.

·How can play add to life quality for aged people?

Czíkszentmihályi describes how "flow" helps maintaining a sense of meaning in old age ? whether expressed as artistic practice, scientific endeavors or golf playing. Neuroscience points to the importance of regular use of mental and motor systems in order to maintain their level of performance. How can play ? games for rehabilitation or training, or social leisure activities, add to life quality of old people?

·How can computer technology be used to design pleasurable learning environments that allow for movement?

Computers, smart toys and digitally augmented environments open up new possibilities to shape playful learning processes. Learning and computers was initially envisioned as one person sitting in front of one computer ? today there is technological support to use computers to augment physical environments, and to devise forms of interactions that include body movement.