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Child's play: Exploring computer software through theories of play

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Abstract: The developments of increasingly sophisticated computer technologies, and growing access to computers in both homes and schools, have seen a proliferation of computer programs and games in children's play. Such programs are commonly used in Early Childhood settings as appealing and valuable forms of computer-based play. Whilst it is important to judge such software on the basis of its learning outcomes, it is equally important to look at the developmental value of its play component. This paper provides a brief overview of classical and modern theories of play and presents a framework for using these theories as a basis for assessing the developmental value of computer software programs for young children. An example of this approach in practice, involving the evaluation of software by preservice Early Childhood educators, is presented.

Introduction

For many years, the powerful role of play in children's development has been documented by theorists, researchers and educators operating from a variety of perspectives. The value of play as it mediates children's experiences of the world, enhancing their physical, intellectual and socio-emotional development, has been widely recognised. More recently, with increased access to technology, the focus on play has broadened to include a consideration of the ways in which children respond to the opportunities that computers and software provide for play. The concern here is not only with the role of play as children engage in formal learning and problem-solving tasks (Clements, 1995) but also with its role in evaluating interactive multimedia learning environments (Rieber, 1996). Educators, in particular, are concerned with determining whether or not children's play, as it has been more formally defined, is encouraged through interaction with computers and 'child friendly' software. Of additional concern is the developmental value of this mode of play for children's development.

A fundamental issue here is how the body of knowledge that has accrued about play can be used in a way that is consistent with what is known about how children interact with computers and software. For educators, a further concern is with the manner in which this information can be made available to preservice teachers so that they can make informed choices about appropriate resources that will support children's development through play, as they engage with computers and software.

Theoretical perspectives of play

For more than 150 years, play has been documented across a variety of cultures, and a range of theories of play has been generated from the information that has been gathered. Nevertheless, as Sutton-Smith (1997) points out, the ambiguous nature of play means that whilst we hold implicit assumptions about what constitutes play, we encounter problems in defining and analysing it. Despite the differences in viewpoints however, there is agreement about the elements that characterise play and that differentiate it from other behaviours.

At least three essential elements that characterise play can be identified. First, play is a spontaneous, self-initiated and self-regulated activity that is relatively risk-free and not necessarily goal-oriented. A second characteristic of play is that it is intrinsically motivated: normally children have an internal desire or motivation to engage in play, they are actively involved in creating their play and are in control of it. Finally, play is a dimension of the 'pretend world', that is, an action and interaction in an imaginary 'as if' situation, which usually contains some roles and rules as well as the symbolic use of objects (Leontiev, 1981; Nikolopolu, 1993).

Classical and modern theories of children's play have identified the myriad of ways in which the physical, cognitive and socio-emotional development of children is enhanced by play (see Table 1 below). A more detailed explanation of these theories is provided elsewhere (cf., Verenikina, Harris & Lysaght, 2003). Classical theories predate the late nineteenth and early twentieth century (Dockett & Fleer, 1999). They look at the driving forces of children's play and mainly focus on its physical and instinctive aspects. Together, they have made an important contribution by placing play in the spotlight for philosophers, theoreticians and researchers to consider. In so doing, the importance of childhood was acknowledged and foundations were laid for further advances in contemporary theories of play.

Contemporary theories of play, on the other hand, are conceptually as well as historically distinct from classical theories. They are concerned with the ways that play benefits children's psychological development. They have continued to influence Early Childhood programs, particularly in under-fives settings, where we now see play located at the heart of the curriculum and used as a vehicle for nurturing children's development across its various domains. Contemporary theories continue to make a significant contribution to how Early Childhood educators plan and implement their curriculum, construct learning experiences, organize their physical environment with regard to play areas and observe and assess children's development in play situations.

Play theorists distinguish different stages and levels in children's play. For example, they recognise different levels of social engagement in play, ranging from a child playing alone (solitary play) to a number of subordinate levels of group play such as parallel, associative and co-operative play (Parten, 1932, 1933, in Dockett & Fleer, 1999; Piaget, 1962; Vygotsky, 1978). In addition, based on the cognitive achievements of children, play can also be categorised as functional, constructive, socio-dramatic or as games with rules (Piaget, 1962; Smilansky, 1968; Vygotsky, 1978), irrespective of whether children are playing alone or in a group. It is in this context that the relevance of play theories can be used as a basis for exploring the developmental value of computers and software in children's lives.

Pedagogical strategies and preservice Early Childhood educators

Preservice educators need to explore pedagogical strategies to guide and support young children as they investigate the possibilities associated with computer use. An increasing amount of computer software has been produced with young children in mind. Such products range from educational software, aimed at supporting children's learning across all subject areas, to the computer games designed for purposes of recreation and entertainment. Regardless of the purpose of a particular item, however, all these items of software tend to be presented in a playful way in order to make them more attractive and age-appropriate to their young audience. Whilst it is important to judge such software on the basis of its learning outcomes, it is equally important to look at the developmental value of its play component.

A subject in the Early Childhood program for preservice teachers has presented a venue for reviewing a number of play theories that account for the value of children's play in their development. In this subject an examination of the developmental value of computer software based on the theories included in Table 1 has been included as an assignment task for students. From each theory, criteria have been derived that connect the theory to an analysis of computer software. A workshop has been incorporated into the subject to outline explicit connections between children's traditional play and computer play. This is followed by a computer lab practicum in which

students examine two samples of computer software, *Jump Start Preschool* (2-4 years) and the *Playroom*, using the criteria summarised in the following table.

Table 1: Classical and contemporary theories of play related to computer software evaluation

Theory of Play	The Value of Play for Children's Development	Analysis of Software
CLASSICAL THEORIES OF PLAY		
Surplus energy theory (Spencer, 1873)	Play discharges natural energy of the body	Does this computer play help to reduce the child's level of arousal?
Recreation theory (Lazarus, 1883, in Dockett & Fleer, 1999)	Play restores energy that is expended in work	Does this computer play allow for rest and relaxation in an enjoyable and engaging way?
Renewal of energy theory (Patrick, 1916)	Play alleviates boredom while the natural motor functions of the body are restored	Does this computer game engage the interests of the child?
Practice for adulthood theory (Groos, 1898, 1901)	Play affords opportunities to develop skills necessary for functioning as adults	Does this computer play provide opportunities for developing adult skills?
CONTEMPORARY THEORIES OF PLAY		
Socio-cultural theory of play (Vygotsky 1977, 1978; Bodrova & Leong, 1996)	Play promotes abstract thought by using objects and actions in symbolic ways	Does this computer play involve use of symbolic meaning (e.g., pretend objects)?
	Play allows children to reach beyond their actual cognitive and socio-emotional levels of development	Do children function above their everyday abilities in this play (do they engage in their zone of proximal development)?
	In play children achieve a mental representation of social roles and the rules of society	Are children provided with an opportunity to act out and explore the roles and rules of functioning in adult society?
	Play enhances self-regulated behaviour as well as the skills of planning, monitoring and control of an activity	Can children create their own scenarios, rules and characters in the computer play? Does it allow for self-discovery?
Cognitive theory of play (Piaget, 1962)	Play consolidates learning that has already taken place while allowing for the possibility of new learning in a relaxed atmosphere	Does this computer play allow the consolidation of existing knowledge or develop new concepts and skills? Does it engage the child in problem solving?
Mead's theory of self (Mead, 1934)	Play promotes a sense of self in terms of personal identity and social relations with others	Does this computer play allow children to discuss and reflect on the components and attributes of a role undertaken by the child?
The theory of communication and meta-communication (Bateson, 1976)	Play promotes the ability to reflect on the variety of behavioural styles and ways of communication	Are there different ways of communication and behaviour represented in this computer play? How detailed are the representations?
Arousal - modulation theory (Berlyne, 1960; Ellis, 1973)	Play keeps the body at an optimal state of arousal, relieving boredom or reducing excess arousal	Does the computer play engage and sustain the interest of the child? Does this play keep the level of child's arousal balanced?
Psychoanalytic theories (A. Freud, 1968; S. Freud 1959; Erikson 1963)	Play reduces anxiety by giving children a sense of power; play provides a socially acceptable way to express forbidden	Does this computer play deal with events that children could not control in their lives including traumatic experiences?

Application of the theories to the evaluation of software

Teachers in Early Childhood settings, as do parents generally, use a range of strategies and techniques to evaluate the software with which children interact. Knowledge of the critical importance of play in children's development leads some teachers and carers to avoid the use of software altogether, preferring instead to emphasize non-computerized activity. However, an awareness of classical and contemporary theories of play allows teachers to make informed choices about software selection that go beyond surface appeal. Such knowledge assures teachers that they will be able to choose appropriate and innovative programs that support and enhance children's physical, cognitive and socio-emotional development.

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