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## Cultural Components of Technology and its Implications for Adult Education

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# **Cultural Components of Technology and its Implications for Adult Education**

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**Abstract:** This article seeks to describe technology and how its design and use embodies values embedded in the dominant culture and is meant to support the hegemonic goals of the dominant culture while suppressing the growth and development of marginalized groups and propose a means of researching between technology and adult learners.

## **Introduction**

Technology is often seen as a neutral, value-free artifact used as a means of enhancing learning with adults. However, technology has been showed to be the artifact of a culture and contains the values of the culture. In today's society, technology represents the values of the dominant cultures and supports the goals and ambitions of the hegemony while suppressing marginalized groups and individuals. While much of the literature on the use of technology promotes it as a positive tool that enhances learning and provides an attractive and meaningful way for the learner to engage with the material being learned, the largess of the literature fails to describe ways in which technology impacts adult learners culturally. The purpose of this article is to take a critical view of the development of technology as a cultural artifact that is deeply imbedded with mainstream values and serves the needs of the hegemony. This article will examine the various views of technology and delineate its potential impact on adult learners. Finally, I will conclude this article with a description of directions for studying technology in adult education settings and suggest various points of interaction to be studied.

## **Views of Technology**

Views of technology can typically be divided into three categories. In the first, Instrumental Theory, technology is viewed as a means to an end; technology is neutral. In the instrumental view, neutrality of technology implies four points: 1) Technology is indifferent to the ends it can be used to attain. 2) Technology is not concerned with the politics of societies of capitalist or socialist cultures. 3) The rational nature of technology is the cause of technology's neutrality and the universal truth it symbolizes. This allows people to believe that because a technology works in one culture, it will work in all cultures (Feenberg, 1991). 4) Because technology is neutral and it is used as a means to an end, the only rational stance is to employ it to solve any problems, regardless of the cost to the environment, culture, or human beings.

Opposite instrumental theory, substantive theory of technology believes that technology is a new type of cultural system that restructures the social system to fit the needs of the technology rather than the other way around. Technology operates to control society and its members rather than as a tool to help society. A similar example of this is the current state of fast food which sees eating only as a technical act while ignoring the social and cultural dynamics involved in the process. By treating the act of eating as a means of ingesting food rapidly, use of fast food has abandoned the cultural and familial

impact sitting at the table has had on the development of family and relations. Feenberg (1991) concludes that “technology is not a means but has become an environment and a way of life. This is its ‘substantive’ impact” (p. 8).

A third view of technology is the critical view which seeks to break from the determinist view that technology will take over and direct society. The critical view of technology (Feenberg, 1991) takes a deconstructivist approach to technology and attempts to develop means of influencing the development and implementation of technology to enhance its use rather than perpetuate the hegemonic structures present in today’s society.

In the critical view of technology, there are three predominant feminist perspectives of technology: Eco-feminism, liberal feminism, and technology as masculine. The first, Eco-feminism, views technology as another means males attempt to control both women and the environment. Eco-feminism (Grint & Gill, 1995) values women’s biology and supports women’s ways of knowing (See Belenky, Clinchy, Goldberger, & Tarule). Liberal feminism views technology as neutral but examines the use of technology as a means to position gender in relation to the technology. Thus, the use and mastery of technology by women has been hampered by societal roles and stereotypical images of women and their capabilities. Liberal feminism views gender as a socially constructed concept that is the result of several small steps taken to deprive women of what is rightly theirs. Its view of technology as neutral, however, denies the potential of society or culture to impact its design and development. The third view, technology as masculine culture, sees technology as an embodiment of masculine culture where masculinity has become central to the definition of technology (Grint & Gill, 1995).

A fourth perspective, the Afrocentric perspective, has not been found to be clearly delineated in the literature but appears to view technology as a means to modify the appearance and performance of African Americans so they look and act more like whites. Examples include x-ray technology which was used to remove the short curly hair and to bleach the skin (Herzig, 2004); and photography film (Dyer, 1999) which was developed to enhance the appearance of the white person to the detriment of the appearance of African Americans. Other bodies of the literature tend to ignore the role African Americans played in shaping technology and inventing it for popular consumption and vice versa. While each of these views approaches technology differently, the following further explains how science and technology can be viewed as culturally embedded.

### **Science and Technology Studies**

Within S&TS, there are four views of technology that inform this paper: Realist Perspective, Social Constructivism, Hybrid Constructivism, and Differentiated Constructivism. While each of these describe the impact technology has on its users, the reader will see that they progress along a continuum which has little cultural involvement in its design on one end and a large cultural influence in design at the other end.

The first view, Realist Perspective, claims that artifacts have inherent properties and agency can be attributed to them. Some of the concepts involved in this position is that technologies have inherent powers that may manifest in any context of use. Some of these properties include constraints on their use and the environment. An example is one point out by Winner (1999) who described the development of Moses’ bridges in Long

Island, NY built to a specific height above the road to prevent larger trucks and buses from passing underneath.

In contrast, Social Constructivism, allows for flexibility of interpretation of the way technologies can be used and recognizes the ability of different social groups to establish and dominate interpretations of the technology. In what is identified as affordances, or the perceived properties of the artifact that suggest how it should be used or responded to, popular discourse persuades or regulates the establishment of affordances. Affordances are developed through standardized practices which shape and dictate how technologies are used. An example would be the crowbar which is often used to break down materials on a construction site.

In an attempt to bring together these two viewpoints, hybrid constructivism sees the value of social factors that impact the use of technology but includes the physical restraints inherent in the design of technological objects. This view takes the position of generalized symmetry of the user and the technology both of which are actants and possess agency and an explanatory role in the analysis of its use.

Differentiated constructivism argues for a position that states the agency of an object is a result of material design and social constructivism but allows for each to be separate from the other. Affordances and constraints can still exist but sometimes they are due to physical characteristics of the technology and other times they are due to social representations of the technology. At other times, affordances and constraints are due to both social representations and physical constraints. However, this position still does not address the role the designers have in attempting to shape both the technology and social context in the development of the technology and subsequent training of users.

I argue for a fifth position, that of culturally mediated constructivism which recognizes that the designers of technology are themselves situated in a social context rife with cultural values and are attempting to design technology to fit into that socially constructed culture and containing physical and sociological constraints that mimic the values of the dominant culture and potentially hindering the development of members of marginalized cultures. Consider the development of any new technology. As new technology is developed, the designers will typically attempt to visualize who the end-user will be and how s/he would use this technology. To that end, designers attempt to specify ways the technology should be used, often called “scripts”. Scripts (Akrich, 1992) govern how technology is used and for whom it is designed. First, designers have a particular vision of who the users are, how they will use it, and for what limited purposes. This image includes specific tastes, competencies, motives, aspirations, political prejudices, etc. and, to an extent, are inscribed in the technology. Second, the actual design, through social or physical constraints, limits acts that can be accomplished thus shaping the user (Akrich, 1992). Consider using the car which requires the user to sit, face forward, place at least one hand on the wheel, etc. The design of the technology requires certain actions to be performed. Consider the headphones of an Apple iPod® or Sony Walkman®, both of which require the user place the headphones over their ears in order to be able to sufficiently hear their music. This is used to bring about a degree of conformity in the user increasing the predictability of the technology and, if enough users employ the technology, on society (e.g. the automobile). As designers attempt to develop technology for consumption by popular society, they will tend to identify the greatest number of users who would benefit from the technology.

### **Potential Impact on Adult Learners**

Considering the above views of technology, I believe that members of the current hegemony view it in the form of technical rationality or that they view it as a means to an end without considering its impact on the person or the environment. This is similar to the capitalist technical rationality which has four potential impacts on workers: 1) Decontextualization, 2) Reductionism, 3) Autonomization, and 4) Positioning. Decontextualization is the process where objects are taken out of their context and viewed as objects of technical practice. Once these objects have been separated from their normal contexts, they can be analyzed according to their parts and usefulness and not the context that developed them. Reductionism occurs when the secondary characteristics of technology are ignored and while focusing only on the primary characteristics. This can be seen when workers are viewed as objects with certain skill sets and ignored as people with families, views, feelings, etc. Autonomization removes the subject of control from the object of control to prevent feedback to the controller allowing the controller to exert control without knowledge of the unforeseen or unwanted consequences. This is exemplified in the use of technology to speed up processing for efficiency and profits while ignoring the existence of repetitive stress injuries or pollution to the environment (Feenberg, 1991). Positioning occurs when the user of technology seeks to place themselves in such a position as to gain the most out of nature as possible. The goal here is to control nature as much as possible to “squeeze” every benefit out of nature possible regardless of the negative impact it may have on the environment, the worker, or society. “Thus the decontextualization of labor opens the space of operational autonomy occupied by modern hegemonies” (Feenberg, 1991, p. 188).

A poststructuralist approach to analyzing technology’s impact on adult learners, reveals using technology can help to have the same impacts on adult learners which will lead to new impacts: Alienation, oppression, and fear. Alienation refers to the effect using technology will have on marginalized groups in relation to the dominant culture. As this is a separate culture, one where the rules are not explicit, those who reside at the margins will find conflict and feel left out, further marginalizing them. As Bruce Sinclair (2004) points out, technology is “contingent and contains unequal power relationships . . . Technology may be socially constructed, but the players are not all on the same footing – a truth familiar to [women and] people of color, who have also long known that both its benefits and consequences are distributed unequally” (p. 12). As marginalized persons attempt to engage with the power relationships that technology supports, they face fear the changes to their lives that can result. If they do take on the culture of the technology developed for current hegemony, they are faced with scripts that may require them to abandon their culture to adopt a dominant culture.

Scripts (Akrich, 1992) are ways that the design of technology impacts how it is used. Use of technology is impacted in two direct ways. First, designers have a particular vision of who the users are, how they will use it, and for what limited purposes. This image includes specific tastes, competences, motives, aspirations, political prejudices, etc. inscribed into technology. Second, the actual design limits the acts that can be accomplished thus shaping the user (Akrich, 1992). Consider using the car which requires the user to sit, face forward, place at least one hand on the wheel, etc. The design of the technology requires certain actions to be performed. This is used to bring about

conformity in the user and, if enough users employ the technology, then technology can have an impact on society (e.g. the automobile). As newcomers to the technology attempt to learn and use these scripts, they will face the choice of adapting to the scripts, modifying those scripts, or rejecting them. If users follow imbedded scripts, there is potential for users to face pressure to adapt their actions to enhance the performance of the technology. This adaptation carried out over several behaviors could modify thinking and beliefs at the individual's cultural level. If users attempt to modify the scripts, they face the dangers of the technology performing less than desired or worse, being dangerous to themselves. Finally, if users reject the scripts and the use of the artifact altogether, they face alienation and potential ostracization from society.

While there have been a great many studies on the use of technology with adult learners, there appears to be very little which take a critical view of technology and seek to understand how the culture of technology shapes or affects the learner. In this next section, I will propose using cultural studies as a means to studying technology and its use.

#### *Studying Technology's Impact on Adult Learner Using a Cultural Studies Model*

Cultural studies is "a particular approach within the wider field of the study of culture" (Johnson, Chambers, Raghuram, and Tincknell, 2004, p. 9). Research in cultural studies typically occurs in moments, or practices that gain particular importance at a particular time in the research process (Johnson et al., 2004). Research into the effect technology has on adult learners can take place during many moments. I have attempted to encapsulate a few in this section and will discuss each of these in more detail below.

#### *Interaction of the Learner with Technology*

Considering that technology is steeped in cultural values and overtones, it is plausible that the user of technology could be impacted by using it. Research needs to be conducted to examine the extent technology facilitates or hinders the learning process as the culture of the technology and the learner either creates a symbiotic or conflictual relationship. Directions in this vein would include understanding the meaning making schemes of learners as they use technology and what changes, if any, occur with its use.

#### *Facilitator with Technology*

Facilitating learning is culturally dependent and requires a in-depth understanding of cultural norms. In order for facilitators of adult learning to be effective, it is imperative that they understand how their learners make meaning. Using technology impacts the facilitation of learning with adults. Researchers need to understand how using a culturally loaded artifact affects a culturally loaded activity such as teaching.

#### *Technology as Power*

Those who are privileged to use technology hold power and sway over those who either do not know how to use it or have access to it. As Apple points out, the social activity of adult education is "tied to the larger arrangement of institutions which apportion resources so that particular groups and classes have historically been helped while others have been less adequately treated" (1990, p. 10 as quoted in Cervero and Wilson, 2001). Technology, often used in adult education, has the potential to continue unequal power relationships and hinder development of adult learners rather than

providing the opportunity for emancipation. Research needs to examine the role technology plays in perpetuating power relationships to the detriment of marginalized groups or individuals.

### *Interpretive Flexibility*

Interpretive flexibility (Brey, 2005) is the notion that artifacts can be interpreted in a variety of ways; including ways different from those of the designers. A simplistic example is that of a mug which can be used to hold a beverage but could also be used as decoration or to hold paint brushes. Just because the designer expects the user to conceive of the artifact in a particular way does mean that the user will. It is imperative for researchers to consider the role interpretive flexibility has on technology's use and adult learning.

### *Acceptance, Modification, or Rejection of Scripts*

As adult learners encounter technology and embedded scripts (Akrich, 1992), they are faced with a choice of using it as the designers expect them to, modifying its use to suit their needs or rejecting it outright for another technology or none at all. Research needs to be conducted to better understand how adults learn or make meaning of those scripts, what process they go through to modify the scripts, and the impact such acceptance, modification, or rejection of those scripts has on the development of their identity.

## **Conclusion**

Technology is becoming ubiquitous in adult education settings yet very little research has focused on the impact culture imbedded in technology has on adult learners. This paper seeks to develop conversation around the role culture plays in the development and use of technology and its potential impact on adult learners, adult learning, and facilitators who use technology.

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