The Social Sciences 11 (7): 1331-1337, 2016
ISSN: 1818-5800

Investigating the Role of ICT in Educational Equality: A Revision of Philosophical Approaches

Saeid Zarghami-Hamrah
Department of Philosophy of Education,
Faculty of Psychology and Education, Kharazmi University, Tehran, Iran

Abstract: The present study examines various philosophical standpoints about Information and Communication Technology (ICT) with the aim of revising its role in educational equality. The methodology applied in this study is the comparative analysis that is considered as a qualitative research approach. As the procedure, at first different philosophical approaches toward ICT are considered under the headings of instrumentalism and determinism and then the outcomes of each approach about the role and position of ICT in educational equality are investigated and contrasted. The instrumentalist approach does not take ICT as involving specific cultural or moral values and, hence, regards the moral questions on applying ICT in education in relation with the purposes that are supposed to be fulfilled by ICT. As a result, it could not be said that the development of ICT leads to the expansion of educational equality. In contrast, the deterministic approach holds that ICT is formed and developed based on particular philosophical and value-laden foundations and hence, imposes its independent power by entering the educational systems. This approach includes the viewpoints of those who optimistically talk about the destruction of unequal constructions in education by the introduction of ICT or those who pessimistically believe that ICT demolishes the educational equality and sometimes morality. This study also, levels criticisms over the mentioned approaches and proposes the third approach instead. In this approach the role and position of ICT in the future education depends on the interpretations of the actors in this field.

Key words: ICT, education, instrumentalism, determinism, language construction

INTRODUCTION

In the first impression, it might seem that origination and development of ICT has no specific philosophy and considering it from a philosophical point of view is not significant and valuable. But, by taking a deeper look it seems that ICT has specific philosophical foundations. For example, Bungee (2003) states that this epistemological principle that human being achieves the knowledge about reality through experiment and thinking and expands this knowledge could be the foundation of ICT development. In a general view, it could be said that ICT has philosophical foundation and is inspired by various philosophical theories and viewpoints. It could also be claimed that with the alterations in the philosophical viewpoints and presumptions about it, the purpose and manner of development or the application methods of ICT are also changed. Taking this viewpoint, it appears that technology is not neutral in a morality sense. Rather as Lockhart (1996) also argues it is a moral phenomenon fluctuating between vice and virtue. In the field of ICT, technology is considered in relation to the concepts such as the goal of life, bliss and morality. To explain this relation it is necessary to address these questions: "what is the nature of technology and how is it developed"?, "what is the purpose behind application of technology"? and "how technology is related to human bliss"? The raised questions show that philosophical inquiry about technology could be practiced from various perspectives including ontology, epistemology and morality. Furthermore as Ess (2002) points out, there are a variety of answers provided by the philosophers and different viewpoints towards these questions.

Although, philosophical consideration and questioning about ICT date back to ancient Greece (Heideger, 1954) by the development of novel technologies in 19th century and its pervasiveness in 20th century philosophical inquiry of technology has also grown. For example, the philosophers Kierkegaard (2010), Jaspers (2014), Marcel *et al*. (1973), Marcuse (1974) and Lyotard (1984) philosophically investigate technology more or less including ICT and its outcomes. As it is clear, the philosophical questioning from ICT as one of the new achievements of ICT does not have a long history. Part of these questions involves philosophical questions from the nature of ICT and its role in human

destiny as well as the role of human being in controlling and orienting ICT. Raising such questions and the attempts to find the possible answers would lead to the clarification of the role and position of ICT in education and the process of knowledge acquisition. Accordingly, by addressing ICT and its role in educational equality and freedom philosophically, the present study aims at classifying the philosophical standpoints toward ICT as well as examining and contrasting the outcomes of these viewpoints for educational equality and freedom.

MATERIALS AND METHODS

As the procedure of this study, first different philosophical approaches toward ICT are considered as two approaches of instrumentalism and determinism. In the next step, after analyzing and contrasting the approached, the explanation of each approach for the role and position of ICT in education and knowledge acquisition are examined and contrasted. To this aim, the contents of valid documents related to the subject under study are analyzed through qualitative content analysis. But, since there are various methods for qualitative content analysis as one of the qualitative research approaches (Given, 2008), the present study applies comparative analysis to fulfill the research goal.

As Rihoux (2006) believes, comparative analysis is the comparison between individuals, discourses, collections, subjects, groups or time periods that helps revealing the similarities and differences. In Encyclopedia of qualitative research (Given, 2008), the main part of comparative analysis is called as "constant comparative analysis" and it is explained that "It involves taking one entity or piece of data such as a statement, an interview or a theme and comparing it with others to identify similarities or differences. By isolating these aspects, it is then possible to develop a conceptual model of the possible relations between various entities".

In the present study, the concepts or predicates that explain the philosophical standpoints about ICT are differentiated and contrasted through constant comparative analysis. This is done with the aim of investigating and proposing views on the outcomes of each standpoint about the role and position of ICT in education and the process of knowledge acquisition.

The philosophical approaches of ICT: Most of philosophical standpoints about ICT could be classified under the two headings of instrumentalism and determinism. The instrumentalist approach takes ICT as neutral that does not possess specific cultural or moral values. Therefore, questioning ICT from a moral point is relevant to the purposes that are fulfilled by using ICT. For example, it could not be claimed that the development of ICT would result in the expansion of values such as equality and freedom.

The philosophical view of Borgmann on ICT could fall into this category. Following the ideas by Heidegger (1954), Borgmann (1999) takes understanding the being as a historical issue and believes that human's understanding of being has undergone changes in various historical periods and it is currently in a new position due to the presence of ICT. ICT has changed the world of generation and innovation, represented in techneor technique introduced by Aristotle in ancient Greece, Christianity, represented in faith and praise of God in middle ages and industrial world represented in industrial constructions and modern devices made until mid-twentieth) into a world in which the subject controls the object. In such a world, nurturing, praising and industrialization are replaced by instruments that are applied in further satisfaction of human desires. In his explanations, he calls ICT as hard and the postmodern technology as soft. In his ideas, the modern technology overcomes the nature through precise supervision, firmness and insistence and creates huge and magnificent constructions such as railways and many modern devices.

But, the postmodern technology is soft and adaptive. He holds that as the postmodern society has moved from production industry to service industry, the products has also changed from goods to evolved information and the reality of postmodernism is hyper reality stimulators that step towards eliminating the imposed limitations of the real world. Therefore, Borgmann concludes that the dominant process in the postmodern era is elimination of natural objects and replacing them with a similar alternative that is in full control of human being. In spite of indicating to such differences, Borgmann (1999) believes that technology is not human destiny and the present technological condition is the results of human choices. Hence, ICT is an instrument that could be applied in the improvement of welfare and facilities.

Contrariwise, deterministic approach holds that ICT is not natural essentially and it includes particular cultural as well as moral values that are inevitably expanded by the growing development of ICT. In other words, ICT reveals its independent power so that individual or collective decisions could not resist it or change its direction.

For example, the supporters of development of computer technologies who are seeking an electronic global village believe that these technologies create democratic types of communication. This type of

communication collapse the conventional hierarchy of communication that leads to inequality, hegemonic system and suppression, expands freedom of speech and in the universal society allows the individuals to express their ideas. In short, the computer communication technologies inevitably develop and expand specific cultural values such as individualism and freedom of speech.

Heidegger (1954)'s viewpoint about ICT is, in some ways, deterministic. Following the history and inspired by the ideas from Aristotle, Heidegger maintains that in the past the concepts of technique or techne were not merely related to the activities and skills possessed by the workers and it included a poetic aspect as well. He holds that revealing or the manner of representation for technology in the old days was different with that of the recent period. In that time, the manner of revealing and representing for technology was innovation or generation but in the new era it is harassing the nature and this is the most basic difference between the new and old types of technology. In Heidegger (1954)'s ideas, the new technology is the last stage of Western understanding from being. As he argues, by the stabilization of the nature of technology, human being has changed to subject while the world has changed to object. Therefore, the nature of technology is not related to the understanding and the use of subject form object and the current relation between subject and object results from the stabilization of the nature of technology. Even, the subject could not resist the growth and development of new technology. In further clarification over the nature of new technology, Heidegger draws attention to the some points: first, the nature of technology is different from technology itself and hence it could not be revealed through studying and investigating technologies. Second, the nature of new technology is not neutral and impartial. He uses the concept of Gestell for elaborating on the nature of technology which means "formatting" or "formation" and considers the technology of paper production and newspaper distribution as an example. He explains that the technology of newspaper distribution is a network started by cutting the trees. The papers are produced out of the trees and finally they are changed to newspapers which affect the human thinking or in other words form and frame their thinking. He concludes that the process of new technology development is, in fact, the process of production, accumulation and consumption of energy which favors efficiency as the only criterion. As a result, he claims that the nature of new technology is ordering the energy resources in a more adaptive and efficient way. In line with these ideas, Jonas (1979) claims that "technology is destiny" Heidegger takes the technological understanding of existence as the human destiny and is not optimistic about exiting this situation (Heim, 2003).

Lyotard (1984) also adopts a deterministic view and investigates the knowledge epistemologically in the postmodern conditions by taking such a view. He claims that by societies entering the postindustrial era and the cultures entering a postmodern era the conditions for knowledge would change subsequently. Pointing to the changes caused by technology in the field of education, he claims that the nature of knowledge would also be altered among these changes: the knowledge that used to be regarded in connection with education and considered as a goal is merely an instrument and goods today. In such a situation, the relation between the knowledge creator and beneficiary is the same as that of goods producer and consumer, hence knowledge, the same as goods, is merely produced for sale (p. 125). As Lyotard discusses, in the postmodern conditions knowledge would be reduced to information and more precisely, to informational goods and education would be led through the language of information and technology with the aim of translating subjects and representations. In this condition, he talks about "crisis of the legitimacy of knowledge" because in the past the meta-narratives such as the natural value of knowledge, according to the Plato's metaphysics that puts knowledge in the foundation of existence, Hegelian dialectic, according to the Hegel metaphysics that believes the end of history to be the emergence of idea and human and humanity's freedom, according to the Marxist view toward history, used to legitimate knowledge. Today, the "efficiency" is the criterion for legitimating knowledge. But, this criterion has risen from the nature of ICT and it appears that what is created by the nature of ICT intends at legitimating its growth and development. This type of mechanism reminds us the mechanism of the self-regulatory systems and for this reason the legitimacy of the knowledge is facing a crisis.

Adopting the "technological system" term and taking a deterministic view, Marcuse (1974) also believes that in the present technological condition, some specific values and criteria has received legitimacy that are in agreement with the development of technology. Consequently, whatever that opposes these values are suppressed. The existing trend requires the individuals to carry out their duty that is helping the cycle of accumulation, development and consumption by accepting the technological system. In such a condition, the individuals would benefit from technology according to their level of cooperation and commitment to technology and they would be suppressed in case of

Table 1: Standpoints of instrumentalism and determinism

Instrumentalism	Determinism
ICT is neutral in values; that is it maintains no specific cultural or moral values	ICT is not neutral and maintains specific cultural and moral values which are inevitably expanded along with ICT
Moral questions about ICT are regarding the goals to be attained by ICT	Moral questions about ICT, not only, are related to its goals but also to its nature ICT inevitably expands specific cultural values including individualism and freedom of speech
It could not be claimed that the development of ICT would lead to expansion of values including equality and freedom	
ICT is not the human fate and the existing technological condition is the result of human choices	ICT is human fate; it imposes independent forces so that individual or collective decisions are not able to resist or change the direction of ICT
ICT is an instrument to be applied in service of expanding facilities and hence welfare	ICT by nature includes further regulation and effectiveness

refusing to do so. In fact, individuals are simply a minor part of the energy required for this system and are not capable of directing the energy. That is the reason the present technological system has limited human awareness and provides the grounds for passivity and inability, on the one hand and dominance and suppression on the other. In sum, Table 1 compares standpoints held by instrumentalism and determinism.

Ess (2002) criticizes the mentioned approaches drawing on the findings from various studies and comparing different cultures. He refers to numerous studies on various cultures encountering ICT and concludes that different culture vary basically in facing ICT so that they have been able to design and reconstruct the technology in line with their specific culture and communicational codes and values. Therefore, in agreement with deterministes, it could not be proposed that ICT imposes its specific values to each culture in the same inevitable way. On the other hand, there are other studies that show eastern cultures indicate further flexibility and changes in applying ICT compared to western ones. Hence, ICT that has western roots and embodies western values has affected the eastern cultures. To offer an example he refers to the research results that show Internet communications have significantly transformed the traditional and unequal relationship between men and women in Kuwait. But, the same study reminds that this transformation is mainly observed among the young rather than old women. Consequently, the absolute acceptance of instrumentalism is not also appropriate.

The language construction approach: According to the shortcomings of instrumentalist and deterministic approaches to explaining existing realities, it seems that we should seek other approach which accepts the value-laden nature of ICT and also attends to the cultural features in facing ICT. In the present study, the term language construction is used to propose a new approach which regards ICT as a social construct which is formed and developed as a result of language and human interactions. This proposed approach is inspired by the social constructivism approach toward technology. Brey (1997) takes social constructivism as bearing various and relevant social approaches in the studies on science and technology. He maintains that social constructivism, beyond the proposed approach by Pinch called Social Construction of Technology (SCOT) includes "social shaping" and "actor-network" approaches that have three common features in spite of the differences. First, the process of technology development is a dependent process that incorporates various elements. Therefore, the technological transformation could not be analyzed by a specific and unilateral method. For example, they could not be analyzed merely according to the economical or technological grounds. Second, the most proper type of explanation for technological transformation is the one that analyzes technological challenges, disagreements and difficulties from the viewpoint of various actors, who are individuals and groups that play or should play, a role in technology. Third, all of the constructivist approaches apply the principle of "methodological relativism" that is proposed in the sociology of knowledge. In this field, the first step is the primary impartiality about the discourses and scientific knowledge about the social phenomenon. That is, the analyst does not express ideas about the manner of ICT such as its efficiency, success or failure, the intellectual foundations of technological processes, the goal or function of ICT and the natural consequences. Of course, this principle does not imply that constructivists take ICT as free value. Rather, it means that the analysts should not prevent the interpretations and explanations by various actors of ICT by their prejudgments. Attending to this principle would lead to further adaptability and flexibility of ICT and open the way to its application.

Stump (2000) suggests that if ICT is regarded as a social construct, the encountering of "living world" and "machine" as well as that of "communicational rationality" and "instrumental rationality" and other options proposed by Habermas and also the self-regulatory of ICT would be eliminated.

Based on the presented discussion, ICT is viewed as a text which could be interpreted in a variety of ways by different actors. In other words, the same as a text ICT is not restricted to one single and personal description and

the discourse ground for ICT reveals the manner of describing and interpreting it. As a result, it could not be taken as inevitable destiny. On the other hand, since ICT is a construction that its formation and growth is dependent on the actors from, it could not be neutral the same as an instrument because it is related to the language and culture that is not impartial. To make it short, the realities of ICT are not determined objectively and by itself rather the interpretations of social groups reveals those realities. This type of viewpoint provides the possibility for intervention in and orientation of the process of ICT development in various fields including the possibilities in the field of education which are offered by the actors in this flied.

RESULTS AND DISCUSSION

The role of ICT in educational equality and freedom: Having introduced the proposed philosophical approach to ICT, we could consider the role and position of ICT in education. Adopting the language construction approach bears possible consequences for the relation between ICT, on the one hand and education and knowledge acquisition on the other which are addressed in the following.

Taking a language construct approach, each novel experience adds to the former meanings of the experiences possessed by the learners and could be a chance for his/her future. In this way, s/he would step toward new experiences and improving his/herself by employing the former experiences. Hence, the consequence of adopting a language construction approach would be supporting free education in contrast to suppressing education.

In suppressing education, the situation that surrounds the learner is considered as an absolute destiny. Therefore, one of the possible threats posed by all of the deterministic viewpoints is that the present condition and the shortcomings are taken as human being's destiny. For example, Greene indicates that in existing suppressing education, consumption is introduced as the destiny of the learners (Ozman and Craver, 1995). He also mentions blind consumerism of goods observed in various societies. Another notable example could be the modern technology that includes ICT which is the subject for this study as the major part. In the same line, Jonas (1979) claims that progress is the natural stimulus for modern technology and discusses that this stimulus operates automatically and inevitably interacting with society so that in the process of technological progress the next stage is always over and beyond the former one. In this way, the technological system undergoes an ongoing progress and growth. Then, it could be concluded that technological progress is a type of organic evolution that is the internal motion of the technological system determining factor over the external factors. This is the reason Jonas calls technology as destiny. Heidegger (1954) also believes that in technology era the universe is forced to reveal itself as a storage source for energy. This source is offered to the learners for domination and use. Heidegger holds that although the nature is rearranged according to the human goals and purposes, the manner it is represented and revealed is not the result of human willpower and it is his destiny which is rooted in being. Subsequently, human being is not able to act against the destiny by making endeavor.

In contrast to suppressing education stands free education. In free education the failures of present technological conditions, that signals to non-neutral nature of technology, is not taken as predestined and absolute since such condition results from social choices by human being. And, there are numerous possibilities for action at the same time. This opens the way to talking about possibilities. The primary step to take in such a situation is raising learners' awareness about the existing technological condition and following that supporting the plausible interpretation on the basis of human beings former standpoints, decisions and actions.

To illuminate on this very first step, it is worthy to refer to the ideas worked out by Adorno and Bernstein (2001), Marcuse (1974) and Ellul (1967). Criticizing technology, Adorno maintains that today the mass are restrained and their awareness are restricted through technological control over the nature. In this way, he criticizes the existing technology and culture which he terms as culture industry. This process prevents autonomy and self-regulation to grow in learners so that they are not able to judge and decide about themselves and their lives consciously. In ICT era and with regard to the increasing progress in this technology, the world is rather forced to represent itself as a source of data storage. This storage is provided to the learners for domination and use. In this procedure either the subject, here the learner or the object are supposed as the sources for storing data and distribution and consumption of goods are introduced to be the regulatory and ultimate goals for this cycle that warrants its permanence. Marcuse (1974) puts forward that in the present technological condition, those values and criteria are legitimated that are consistent with the development of technology and other opposing ideas are suppressed. The existing trend requires the learners to fulfill their duties in helping the cycle of accumulation, distribution and consumption by supporting the current technological condition. By doing

so the learners would receive a share from the technological system as much as the cooperation and commitment they have, otherwise they are marginalized by the technological system. In fact, the learners only play the role of providers for a trifling part of energy needed by the system which they are not capable of directing. From this point of view, the behavior of learners would be valued only when they carry out their function which is supporting the technological system in a convenient and appropriate way, since learner's behavior aims at maintaining the social-technological system, s/he is not free and autonomous in her/his actions. This would lead to the restriction of learner's awareness by the technological system which creates a condition that, on the one side, makes the learners passive and unable and, on the other side, dominate and suppress them.

Ellul (1967) also points out that if the human aspect of life is supposed as subsidiary and dependent on the technical reason, technology would get an absolute and limitless power. In other words, if "logic" of technology is considered as equivalent to "reason" then the human being would become the slave of new technology. He argues if technological thinking dominates the society, cognition, action and learning by human being would take on a technological sense and following that human being's life would be technical while it is supposed that technology is autonomous and not dependent on human being's behaviors.

Adopting a language construct approach, the current condition of ICT in human being's life including education would be the result of his viewpoint toward life and the goals that he selects which have led to present condition. In this sense, the ideas by Heidegger (1954) seem acceptable that technological view toward existence and the fundamental significance of efficiency criteria has led to the existing condition of human being. Furthermore, he discusses that the fast progress of technology has challenged the intellectual heritage of human being. According to the increasing growth of information, he contrasts meditative thinking with calculative thinking done by the computer. In this way, he raises an important question: we should ask whether thinking would end in the information processing market? (Heim, 2003)

According to the discussion, it could be proposes that as the first step the educational systems might take a language construction approach to growing learners who, in the next step, question the current technological condition and then revise the standpoints as well as concepts such as reason, efficiency, morality, death and life meaning that lead to such a condition. Questioning and probing human being's understanding of existence in various historical eras and in areas with different cultures and traditions could be helpful to the learners at this stage.

CONCLUSION

The present study analyzed and compared two philosophical approaches, instrumentalism and determinism, toward ICT and proposed a third approach termed language construction. The instrumentalist approach does not take ICT as possessing specific cultural or moral values hence it considers the moral questions from applications of ICT in education in relation to the goals that are supposed to be attained though using ICT. In this sense, for example, it could not be said that ICT development would lead to the growth of educational equality and further freedom. Contrariwise, in deterministic approach, ICT is formed and developed on the basis of particular philosophical standpoints and values hence it transfers its power to the educational systems it enters. The viewpoints of those who optimistically talk about the elimination of inequality in education by the introduction of ICT or those who pessimistically talk about ICT destroying meditative thinking and even morality could be placed in this approach. Finally, the language construct approach was proposed by criticizing the mentioned approaches in order to provide the grounds for revising the role of ICT in education according to a deeper and more comprehensive view. In this approach ICT, on the one side, is regarded as a social construct that is formed and developed as a result of language and human communication and on the other hand, the role of ICT in future education is dependent on the interpretations of the actors in this field including the learners.

Embracing such a view, ICT, the same as other human achievements is a cultural construct that arise out of human language. Consequently, since human language is interpretative by nature, ICT would also take on an interpretive feature or "aesthetical nature" and is observed from an artistic point of view. By this type of view, the educational system are able to grow learners who, at first, question the current technological condition and then revise the views and the concepts such as reason, efficiency, morality, death and life meaning which have caused this situation. Following this goal, they are capable of planning a future for ICT with the aim of educational equality and freedom according to the mentioned revisions.

ACKNOWLEDGEMENTS

The study has been done during the sabbatical leave of the researcher at TU Delft in the Netherlands. The researcher also likes to thanks the office of the vice president for research of Kharazmi University that provided this valuable chance.

REFERENCES

Adorno, T.W. and J.M. Bernstein, 2001. The Culture Industry: Selected Essay on Mass Culture. Routledge, London and New York, USA. and UK., Pages: 83.

Borgmann, A., 1999. Holding on to Reality: The Nature of Information at the Turn of the Millennium. The University of Chicago Press, Chicago, Illinois, Pages: 285.

Brey, P., 1997. Social Constructivism. J. Society. Philo. Techno., 5: 18-40.

Bungee, M., 2003. Philosophical Inputs and Outputs of Technology. In: Philosophy of Technology: The Technological Condition and Onthology. Scharff, R. and V. Dusek (Eds.). Blackwell, London, UK., pp: 172-181.

Ellul, J., 1967. The Technological Society. Vintage Book, New York, USA., Pages: 449.

Ess, C., 2002. Cultures in collision philosophical lessons from computer-mediated communication. Metaphilosophy, 33: 229-253.

Given, L.M., 2008. Encyclopedia of Qualitative Research Methods. Sage, London, UK., Pages: 1072.

Heidegger, M., 1954. The Question Concerning Technology. In: Technology and Values: Essential Readings. Hanks, C. (Ed.). Wiley-Blackwell, Oxford, UK., Pages: 99-113.

Heim, M., 2003. Heidegger and McLuhan the Essence of Virtual Reality. In: Philosophy of Technology: The Technological Condition and Onthology. Scharff, R. and V. Dusek (Eds.). Blackwell, London, UK., pp: 191-204.

Jaspers, K., 2014. Man in the Modern Age. Routledge, London and New York, USA. and UK., Pages: 208.

Jonas, H., 1979. Toward a Philosophy of Technology. In: Philosophy of Technology: The Technological Condition and Onthology. Scharff, R. and V. Dusek (Eds.). Blackwell, London, UK., pp: 191-204.

Kierkegaard, S.A., 2010. The Present Age: On the Death of Rebellion. Harper Perrenial Modern Thought, New York, USA., Pages: 128.

Lockhart, T., 1996. Technological Fixes for Moral Dilemmas. J. Soc. Philo. Techno., 49: 137-152.

Lyotard, J.F., 1984. The Postmodern Condition: A Report on Knowledge. University of Minnesota Press, Minneapolis, ISBN: 9780816611737, Pages: 110.

Marcel, G., ýP. McCormick and S. Jolin, 1973. Tragic Wisdom and Beyond. Northwestern University Press, USA., Pages: 251.

Marcuse, H., 1974. One-Dimensional Man. Routledge, London and New York, UK. and USA., Pages: 200.

Ozman, H. and S. Craver, 1995. Philosophical Foundations of Education. Merrill Publishing Company, New York, USA., Pages: 423.

Rihoux, B., 2006. Qualitative Comparative Analysis (QCA) and related systematic comparative methods: Recent advances and remaining challenges for social science research. J. Inter. Sociology, 21: 670-706.

Stump, D.J., 2000. Socially Constructed Technology. J. Inquiry, 43: 65-85.