GENDER INEQUALITIES IN HIGHER EDUCATION, INFORMATION COMMUNICATION TECHNOLOGIES AND SUSTAINABLE DEVELOPMENT:
What are the connections?

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ABSTRACT

This conceptual paper raises concerns about gender inequality in higher Education with a special focus on university based education in the context of the developing world and in Africa, particularly. Within the broad thematic area of gender, education and development, this paper uses documented evidence to appraise one of the most recent developments in educational transformation; which is online teaching and learning. World wide, higher education institutions are facing unprecedented challenges to introspect as they move into the information and knowledge age. As part of the knowledge society, these institutions are also regarded as hubs of innovative development ideas and practices and domains for the transfer of these ideas to society for sustainable development. These high expectations put pressure on these institutions to radically and positively respond to demands for reform. One of the key areas on which these institutions have been challenged to transform is that of gender inequity in their structures and programmes. This paper critically surveys how online teaching poses as a challenge to universities as they grapple with issues of gender inequality. The thesis of this paper is that technology mediated teaching and learning further disadvantages the already marginal group, women who are a large part of the populations of societies in these contexts. The paper is concluded by teasing out some of the factors that have made this challenge so hard to address by universities. Suggestions are made on some of the strategies that could be employed to deal with this challenge so that women could reach their full potential for contribution in sustainable development processes.

KEY DESCRIPTORS: Education, Sustainable Development, Gender Inequality, Online Teaching, Information Communication Technologies

INTRODUCTION

World wide, higher education institutions are facing unprecedented challenges to introspect as they move into the information and knowledge age. These institutions are an integral part of the knowledge society. In this society, they are regarded as

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hubs of innovative development ideas and practices. They are also domains for the production, and transfer of these ideas in the context of a globalizing world. Evidently, expectations around the role of higher education institutions in development are high. This puts pressure on these institutions to radically and positively respond to demands for reform in order to effectively take up some of the new development challenges. One of the key areas on which these institutions have been challenged to transform is that of gender inequity in their structures and programmes. Views are very strong that gender inequality in higher education is detrimental to sustainable development because it denies a large part of the populations of societies to contribute to their full potential in development processes.

There is also an established belief that higher education institutions are relatively well placed as agents of sustainable development. De Rebello (2003) in her paper on the role of higher education institutions in the UN Decade of Education for Sustainable Development cites the then UN secretary general Kofi Annan as having said that:

> "Our biggest challenge in this new century is to take an idea that sounds abstract, sustainable development, and turn it into reality for all the world's people." Making the abstract real, and developing the capacities of individuals and societies to work for a sustainable future is, essentially, an educational enterprise (p. 3)

De Rebello further observes that these expectations have been echoed at World summits, regional and international Conferences and in national policies and plans on education and sustainable development. The UN, which is spearheading these ideas, has set 2005 -2014 as a decade of education for sustainable development. This and other similar initiatives have given countries the needed impetus and provided them with a framework for action to facilitate the role of higher education institutions in development within their many and diverse contexts. Among the many critical issues that underpin these commitments, gender equality features very prominently as one of the key vehicles for achieving transformed higher education institutions that can take the agenda of sustainable development forward. A need to redress the situation of gender inequality in education is also presented as goal number three of the Millennium Development Goals (MDGs). This goal covers three areas, which are elimination of gender disparities in education, the documented positive impact of this for society and what institutions of education can do to close the gender gap in education. Of particular relevance in this paper are the commitments and declarations that link possibilities of closing the gender gap in education to access to and control over information and learning through the use of technology in the education system and in the rest of society.

In the discourse on the intersections of gender inequality in education, sustainable development and access to information and communication technologies in higher

education, there are many questions posed. One of the most fundamental and frequently asked questions is whether higher education institutions in their present structural forms and in the ways in which they are run, are up to the challenges of the knowledge society. Do they have the necessary capacity to effectively play their expected role in the context of today's society? Today's society is still grappling with the broader issues of social injustice and human rights violations that stand in the way of certain sectors of society to make meaningful contributions to development. One of the areas of injustice, which is of central concern in this analysis, is gender inequality in education at all levels.

AN OVERVIEW OF GENDER INEQUALITY IN EDUCATION IN AFRICA

Since the Jomtien 1990 World Conference on Education in Thailand and fuelled by the quest for sustainable development and economic growth, African nations have placed education at the centre of their development efforts as one of the key agents for this growth. For girls and women's education, the 1993 Pan African Congress on the education of girls held in Ouagadougou, which was aimed at giving this a priority, is worth mentioning here. In the late 1980s the World Bank played a key role in investments on the education of girls in order to close the gender gap, starting with provision of support to research. One of the major conclusions from these studies was that under investment in female education is a waste of resources (Swaison, Bendera, Gordon & Kadzamira, 1998). UNICEF and UNESCO have also played a leading role in this course to improve the status of girls through protecting their rights and needs for education. As a result of these initiatives, in the African context against the backdrop of Education For All (EFA), remarkable efforts were made to ensure that every child gets access to quality basic education.

In sub-Saharan Africa, many country estimates show that between 1990 and 1998, the net enrolment of boys increased by 9 per cent to 56 per cent while that for girls was by 7 per cent to 48 per cent. Girls represent 56 per cent of the estimated 41 million children of school going age who are out of school in the region. Gender parity is said to be highest in Southern Africa, where many countries have attained near universal primary education and high adult literacy. It is to be noted, however, that having entered school, girls have a 69 per cent chance of reaching Grade 5, compared with 70 per cent for boys. These figures have to be read bearing in mind variations due to multiple national circumstances such as each country's economic or political status. It is also worth noting that access is not enough as it evidently does not always guarantee a better job that often carries with it better social status, prestige and sometimes power and authority (Davidson & Kanyuka, 1992)

In spite of these positive initiatives with regard to educational provision, as evidenced by increased enrolments, preference for boys' education is reported to have persisted, and so has the recorded growth in the gender gap in literacy (Leach, 1997 cited by Swaison et al. (1998); Davidson & Kanyuka, 1992). National reports also

show very little progress made in the effort to improve the status of women in education (Stromquist, cited in Swaison et al, (1998). Chung (2006) during her discussion with Barnes also observed that in Africa and in southern Africa in particular, the post liberation state has been something of a disappointment for women. For example, in Zimbabwe while the goal of universal primary education was reached in the 1980s to the 1990s this is not true anymore and that similar loses were registered in Tanzania and Zambia after initial post independence successes (p.121)

WHY FEMALE EDUCATION IS A KEY FACTOR IN SUSTAINABLE DEVELOPMENT

Almost every country in the world has signed the international instruments, protocols, conventions and treaties that address issues of gender inequality as framed in the rights discourse. Most particularly, they have committed themselves to the UN Millennium Development Goals. Among others, these goals aim to improve life for girls and women. This aim most fundamentally includes creation of equal opportunities in education and women's empowerment by 2015 (Sandler, 2007). One of the leading activists and a prominent educator who has special interest in the education of girls and women, Fay Chung as referred to earlier, has this to say about her interest in Women's leadership:

I now see that women's leadership is the key to all forms of development in Africa. Unless we develop a strong and progressive leadership of women we will not be able to go forward. Women

in Africa have not been able to play their full role in development, as a result of the feudal traditions which place women in a supportive role, with little economic and political power. Women are not well represented at tertiary level, particularly at university level and this has serious repercussions for the type of leadership that women enjoy (p.118).

Dobriansky (2006) argued along similar lines when he said that no country can thrive in which the voices of its women are silenced, their rights violated and their potential untapped. In this view with which I strongly concur, guaranteeing the human rights of women such as their right to education and participation in leadership is fundamental to building stable democracies and economically prosperous societies. Dobriansky concludes his remarks by saying that in order to fulfill their responsibility as architects of a better future, all world leaders must pursue the goal of girl's education because nations that marginalize half of their populations cannot survive as democracies or as free, prosperous and open societies

Goal three of the United Nations led MDGs focuses specifically on the promotion of gender equality and empowerment of women. Evidently, this goal was set up against the background of the gross gender inequalities particularly in leadership as demon-

strated by the figures presented here. Around the world, women hold only 16% of the seats in national parliaments and they make up 80% of refugees together with their dependent children. 60% of children who are not in school are girls. Women perform two-thirds of the world's work and receive only 10% of the world's income (World Vision, 2006). This limits the life chances of girls and yet as World Vision International, an international non-governmental organization, concludes, educated girls have better choices in life around marriage, child birth, education of their children, health and civic participation including assumption of leadership roles. All of these are an integral part of the ideals of sustainable development

The situation is not different for the Southern Africa Development Cooperation (SADC) region, from where this analysis originates. In a welcome address at a consultative conference held in the Namibian capital, Windhoek, a Malawian President Bakili Muluzi said that for the region to achieve desirable levels of productivity, which was the theme of that meeting, SADC needs to pay particular attention to the development of small to medium scale enterprises. President Muluzi recognized the critical role played by women in the development of the region particularly in rural communities and urged his fellow leaders to do everything possible in upgrading the status of women in the region. President Muluzi reiterated the region's need to act on this by saying SADC states needed to make dramatic moves to promote gender equality because if they did not they would ill deeply regret having left their women behind as workers.

Furthermore, Muluzi observed that women's legal status, social position and participation in development planning, decision-making and community participation can no longer be marginalized. When the SADC heads of state signed the Gender Declaration following recommendations by the Council of Ministers at that Windhoek Consultative Conference, where gender issues were pushed higher on the SADC agenda, they agreed that gender equality would be regarded as a fundamental human right. Over a decade after the global declaration in Vienna in 1991, SADC, finally endorsed it and gave it a priority place on its agenda. The heads of states of SADC also demanded through this declaration that equal representation of women in decision-making structures at all levels as well as facilitation of their full access to and control over productive resources be given special attention. Subsequent to this and following a realization that high literacy and a well-trained labor force are vital for the region to achieve its full potential, the summit did not hesitate to sign the protocol on education and training.

WOMEN IN HIGHER EDUCATION: A FOCUS ON UNIVERSITIES IN AFRICA

According to De Rebello (2005), the World Conference on Higher Education (WCHE) 1998, organized by UNESCO, identified the core missions of higher education systems as education, training, research and, in particular, contributing to the

sustainable development and improvement of society as a whole. These institutions are expected to provide opportunities for learning throughout life for all sectors of their societies in response to the needs of those societies.

Many world conferences and national commitments to strengthening education at this level emphasized access to education at all levels. De Rebello further notes that what was especially significant about the 2003 International Conference on Education for a Sustainable Future, which was held in Prague, was its emphasis on the practical role of higher education and its expected role provide innovative strategies for changing curricula, changing the functions of education institutions, educating students toward sustainability ends and ensuring that research serves the needs of economic and social development.

In an article on *Women in Higher Education: Issues and Challenges*, Morley (2005) asserts that gender, higher education, and development have rarely intersected resulting in the silence in terms of policy, literature, and research. She explains:

Yet there are aspects of gender in higher education that appear to create discomfort and disturbance for feminist scholars across the globe. Gender inequality is a feature of social relations in most societies. It is linked to poverty, violence, the labor market, health, housing, and education. It structures the relations of production and reproduction and is inextricably linked with knowledge construction and dissemination.

In this critique, Morley (2005) suggests that there has been little sustained attention globally to the role that higher education plays in challenging and reproducing gender privileges and disadvantages and that the issue has been left largely to feminist academics to record and account for the persistent inequalities and gendered power relations in academic institutions. This paper is an attempt to unearth some of the concerns in this area and to raise questions for further reflection as the African university of the twenty first century is challenged to transform. One of the areas of transformation in universities is in instructional methods from the traditional face to face modes to technology mediated learning and teaching.

TECHNOLOGY MEDIATED LEARNING AND TEACHING IN HIGHER EDUCATION: A DEVELOPMENT ISSUE IN THE AFRICAN CONTEXT

Carr and Czerniewicz, (2007) observe that in many Southern African universities and school systems the establishment of educational technology systems is likely to take higher priority than researching these rollouts. Yet, educational technology remains a severely under-researched field in this region compared to other regions. Carr and Czerniewicz note that educational technology issues in Africa are both deeply specific and closely aligned with global educational technology issues, which are refracted through local contexts. Various studies in this field ask serious questions about the role of information technologies in educational and societal change (Carr &

Czemiemewicz, 2007; Kwapong, 2005; Cantor, 2002). The argument for analysis in this section is that technology mediated learning is not a gender neutral undertaking but as much a force for increased gender inequality in higher education as its potential as a tool for closing the gender gap.

University Online Teaching and Learning as a Gendered Project

The movement toward online instruction is quickly sweeping across the globe (Ferganchick-Neufang, 1997). The benefits of this have to be assessed and understood within the broader context of the world technological revolution. This rapid development is steadily affecting ways of thinking about instruction at all levels of educational systems. Indeed, Information and Communication Technologies (ICTs) are changing the face of the twenty-first century (Cantor, 2002).

In 2003, the United Nations in collaboration with the International Communications Unions (ITUs) held a world summit on this issue. Thereafter, another meeting was held in Switzerland in 2003 followed by yet another in Tunisia in 2005. At those gatherings, the world leaders were to develop a common vision and understanding of the concept of the "information society", its scope its strategic plan of action and also to declare the principles for Action (Cantor, 2002). Literature surveyed for this paper indicates that at meetings such as these the complexities and challenges of the information age are illuminated. These include among others, issues of access to technology and its accompanying infrastructure; the question of equal access and use; as well as access to the benefits of using these technologies within nations and across regions of the world.

The users of ICTs are also central to the debates, with due recognition of their diversity in terms of needs, cultural contexts, economic backgrounds, knowledge and information levels about the technologies, power authority and control over these and on other social dimensions. This paper aims to discuss some of these dimensions within a university setting and in the context of the developing world using gender as a point of reference and one of the key social issues in University online teaching and learning.

Online teaching and learning in this paper is used to refer to technology mediated web based instruction and learning processes. A framework developed by Collins and Berges cited by Conrad (2004) categorizes online instructional roles into four general areas. These are the pedagogical, social, managerial, and the technical. It is some of the social aspects of on line teaching that are explored here while highlighting their interactions with the other aspects to possibly either break or make more effective online teaching in the context of the university. These are discussed in relation to two key facilitators in online teaching, that is, university planners or decision makers, on one hand and, the instructors, on the other.

The world over, online teaching and learning is increasingly becoming a vital part of

the systems of instruction at the university. In the context of the African university, this marks a very distinct process of change in the overall system of instruction. By taking this on board, universities are being responsive to one of the most daunting development challenges of this millennium as they also try to stay in tune with global and mainstream educational developments.

Online teaching and learning, much as it is usually described as a self contained approach to knowledge sharing, it is also a very complex and dynamic process. This is particularly so in the context of universities of the developing world where the approach is relatively new and undeveloped. While in the context of the developed world online teaching has gained significant currency over the years, in the context of the developing world it is still just a complement of the traditional face to face instruction. Face to face communication in these contexts is still the most common way of passing information and its modalities, yet, according to Burch (2002), there has been very little change over many centuries.

Online teaching in the context of universities in the developing world, still poses many challenges such as unavailability of the relevant technology and the needed infrastructural resources and lack of national and institutional policy frameworks on ICTs. For universities, these conditions adversely impact on decisions particularly about expenditure on the needed resources to initiate technology-based instruction. These difficulties are accentuated for universities by the fact that many politicians, senior civil servants and intellectuals have argued that the continent's primary concern should be to resolve problems of development. Among these problems are widespread poverty, high illiteracy rates and inadequate health services. They argue therefore that resources cannot be diverted to the ICT sector before these issues have been addressed (Rathgeber, 2000).

This attitude of African leaders to technology raises a pertinent question about the issue of "buy in" to technology-based instruction by those in educational leadership. Studies show that most of these are male whose biases shape the decisions, processes and practices they lead and oversee. This makes gender an issue in decision making about ICTs in a university context. It is important also to underline at this point, the fact that "buy in" is a social attitudinal issue that seems to play an important role in decision making about many change initiatives. In this case, it seems to interface with other factors such as gender, power and leadership and national economic factors to make a complex phenomenon that can not be understood from a purely technological standpoint. Buy in as an operative concept in this paper is also a manifestation of the Knowledge, Attitudes and Skills (KSA) schema that is brought into this analysis of online teaching to illuminate the relationship between KSAs and gender in technology mediated learning and teaching.

Gender Issues in Online Instructional Processes

Literature on online teaching often focuses on the teaching environment (Anderson,

2004) in particular, the pedagogical aspects. Carr and Czerniewicz, (2007) observe that from a pedagogical standpoint educational technology is about learning processes that involve a considerable number of inter-related issues. These include the percolation of new ICT-mediated social practices into the educational arena. These authors further observe that the challenges to traditional methods of content creation and sharing; the rise of open education resources, and the increased possibilities of abuse of these technologies are central to this discussion. It is also the case for the ways that teacher-student relationships are mediated, challenged and reconstituted. However, the gendered impacts of online technologies are often ignored. Questions regarding undue gender differentiated access, staffing, environments and effects are hardly addressed and if done they are often narrowly defined

It is worth noting that first and foremost tutors and learners are human beings, and most importantly they are social beings and therefore they bring into the learning environment, certain socially constructed identities and meanings as well as socially-defined roles and skills that can either make or break the processes of teaching and learning online. For both instructors and learners, while some of these skills might have been acquired from their training, there are some which are personal such as their interests, love for what they do, previous experiences, beliefs and perceptions, self confidence and even pressures from their environment. In this paper, it is being argued that one of the most important social skills in online teaching is the instructor's ability to appreciate the centrality of gender diversity in learning and teaching environments particularly in as far as effective use of technology is concerned.

Gender Diversity: An Issues in Technology Mediated Teaching and Learning

A need to recognize and appreciate individual difference features prominently in most discussions on instructional environments and also in those on successful implementation of on online teaching and learning. One of the bases for learner differences is gender, which is a social construct. Literature, however, identifies differences in many other areas such as learning styles, cognitive skills, age, class, ethnicity and culture, geographic settings, interpersonal skills. Yet, these exist in spite of gender, as they affect and intersect with gender. As gendered being, humans still maintain learning styles, age, class, ethnicities, cultures, locations and interpersonal skills. Gender as a cross-cutting issues manifest all such characteristics as well. Above all, within the context of this analysis, these factors have impact on the many aspects of online teaching and learning.

For example, a very important aspect of online learning that has been extensively discussed is ability or lack of ability to build social networks. This being a culturally grounded activity, it is also not only about networks. But it is about how these networks are built and who for instance between male and female learners would be more free and able to initiate the networks as forums or vehicles for learning. African socialization processes are such that it is the males who are socialized to being

more outgoing and assertive in the development of an interactive environment while women on the contrary are expected to be reserved. This issue is mentioned here in order to underline the fact that online teaching, virtual as it is, it also a highly interactive process and that social interaction processes are culturally framed.

There are many and varied facts about the differences between boys and girls in technology use and technology mediated teaching and learning. For example, it is reported from the United States that from their socialization, girls aged 14-17 years prefer data entry classes, the modern version of typing to computer science. The association of American University Women reports that boys exhibit higher computer self-confidence, and a more positive attitude about computers than girls. In terms of enrolment, women at the University of Michigan have made advances in every field except computer science with only one in 10 computer science majors being female. Even though these data are from America and in view of the paucity of data on these from the context of the developing world university and Africa in particular, strong parallels can be made between these contexts in terms of trends because the gender gap between boys and girls and men and women in the use of technology is a very well established notion world wide (University of Michigan, School of Information, 2000).

In discussing the gender gap in the use of technology, for online teaching, a focus on the use of the computer becomes very relevant because online teaching is mainly computer mediated learning. In this regard, boys and girls are reported as tending to view computers differently and therefore use them differently. This is a behavioral issue that can contribute to successful or unsuccessful implementation of online teaching and learning. In the context of the family and also in the instructional environment many authors report subtle messages that are sent to girls and boys about expectations for their behavior and perceptions around technology. In both the developed and the developing world the types of toys that either boys or girls get, determine to a great degree their interest in technology with boys who get computer games for birthday presents while girls get dolls. This situation gives boys a head start over girls in their exposure and learning. These messages are viewed as having direct influences on the different behaviors of boys and girls towards technology (Educators Guide to Gender Bias (1999). Taking a gender analysis perspective to child development there is a notion that at adolescence, girls too tend to experience a weakening of self perception. When this happens they are said to refrain from asking questions and sharing answers. These characteristics seem to be radically contradictory to the ideal character of an online learner who should be ready and able to engage in the interactive learning environment where social presence is harder to create.

PROGRAMMIING FOR GENDER SENSITIVE CHANGE

It has been suggested from the foregoing, that an attempt to map the interfaces be-

tween gender inequality in higher education, online teaching and sustainable development is a complex and multidimensional project. The relationship amongst these also poses many challenges for universities. This seems to be particularly the case in the developing world where the ground of technology mediated teaching and learning is still very fresh. The perceptions and the practical demands that this new environment places on those who operate in it are many and varied making adoption and implementation just as complex and challenging.

In this environment learners are central because as Truman-Davis, Furtch, Thompson and Yonekura (2000) said it is the self motivated students who will succeed in on line learning because they possess the requisite high meta-cognitive skills and are better organized to navigate the processes. This serves to suggest that while making technology available seems an absolutely logical and justifiable starting point in the implementation of online teaching, there are very serious influences between how it is applied and its positive impact on learning.

Consequently, there is need for planners in higher education institutions, managers, implementers and recipients of online teaching to seriously unpack some of the taken for granted concepts. These include concepts such as instructor, learner, the learning environment and the learning process and the decision making dynamics about online teaching. This paper advocates for the inclusion of gender perspectives in the analysis, creation and promotion of online learning environments. This will make it possible for determining how women and men; their respective expectations, strengths and weaknesses can be addressed appropriately to remove biases and gender returns. The same thing needs to be done for the instructors and those in the decision making structures of the universities because evidently online and technology mediated teaching and learning is a gendered process. In short, there is so much more that has to be learned about online teaching for it to be appreciated as a tool for transformation in higher education and sustainable development. People-centredness as an approach to the planning of technology mediated teaching and learning with particular reference to online teaching seems to be an imperative for effective driving of this societal change.

Most studies have linked the lack of progress in adoption of technology mediated teaching and learning in higher education institutions to conservative educational policy frameworks, institutional structures that are not responsive to current educational challenges in the area of gender equality and socio political contexts that are constrained in their advocacy and implementation of initiatives on educational reforms. Davidson and Kanyula, 1992) argue that within the Gender and Development discourse, there is evidence to suggest that the critical problems of food shortages and food insecurity, poor health care, rapid population growth which are severer in the African context, will not get resolved if the education of girls and women is not given priority. This paper challenges higher education institutions from a human rights and social development perspective to rethink their priorities. In their teach-

ing , research and service, these institutions are called upon to align what they do and how they do it with current thinking and best practices in the area of gender equality if they are to play their rightful role in sustainable development. It is also suggested that when they do this, they need to focus on the perceptual, structural, policy making and pedagogical levels of their business with gender equality as their central aim and vehicle for increased effectiveness in technology mediated learning and teaching as well as in the conduct of the other aspects of their business.

These views are in line with the realization that around the world communication technologies (ICTs) have changed the lives of individuals, organizations and indeed, entire nations. Therefore, no country, institution and only a few communities are being left untouched by the 'information society. Odame (2005) argues most vehemently and I concur, that there is a strong relationship between ICTs, their development and human rights and that a recognition of this relationships can have profound implications for women and men in terms of employment, education, health, environmental sustainability and community development. Therefore, a need for policies that are able to ensure that investment in ICTs contributes to more equitable and sustainable development cannot be over emphasized. These technologies are neither gender-neutral nor irrelevant to the lives of resource poor women and, as Odame further notes, women want information and to engage in communication that will improve their livelihoods and help them to achieve their human rights. This is a formidable challenge facing all societies in today's world, and especially developing countries. African universities are an integral part of this context and therefore are just as affected and responsible for this change as the rest of society.

Policymaking for gender and ICTs for development or what might be referred to as 'engendering ICT policy' has been attempted from at least three different directions. The first approach has largely emerged from academics, the second from 'gender mainstreamers' within or close to the UN system and the third from developed and developing country feminists in civil society who have detached themselves from the UN system. Of specific relevance in this paper is the contribution by academics, most prominently university educators, through different associations and professional groups such as women engineers and agencies. They lobby and educate various audiences for gender equality and gender sensitive ICTs by priority and integrating gender, science and technology (GS&T) in their work. They also advocate on the need for improved science education and careers for girls and women. Their fundamental argument has been that women must have access to the education resources and technologies essential for development. This pushed high on the development agenda and action on gender and ICTs. Discussions of this issue continue in the context of national mainstream policies on educational transformation (Odame, 2005)

It is correctly observed that even in the community of practice committed to 'digital opportunities', there is a risk that the gender gap remains. As Hafkin and Taggart (2001) have explained:

...this bias is evident in three ways: (1) women are rarely involved in the needs assessment of ICTs for development; (2) attitudes that high-end information technology 'is not for women who are still being treated as passive recipients of information and not as active information users and communicators; and (3) there is considerable delay in addressing the limitations faced by women in accessing supposedly 'public' information spaces, or even private sector initiatives such as cyber-cafes(p.13).

Further, these biases are often reinforced in national and international policymaking and investment planning because women's organizations have had little or no real opportunity to play an active role in developing the ICT sector and removing its gender biases. Therefore, it is absolutely critical for the information society to have a gender responsive policy and funding structure which would inform institutional policies on the issue.

It is a fact that at an alarming rate, women, relative to men, are experiencing higher rates of hunger and malnutrition and illiteracy, they are overworked and suffer the effects of sexual violence with direct impacts on children, the sick and the elderly under their care (Kerr et al 2004). Therefore, knowledge on the ICT gender gap is needed to inform policy and advocacy on strategies for overcoming poverty which is directly linked to economic and social justice for all. Realization has is increased on how ICTs are building new channels for social awareness, mobilizing resources for resource-poor women and networking women as well as men who are supportive of human rights goals (p.4).

Bush and Sallernelli (2000), cited by Kirk and Mulay (2004), have said that education for girls is both part of the problem and a solution in their struggles for equality. The school environment for instance, is a seat of gender based repression and discrimination. The University environment is no exception in this regard. For most girls school experiences abound with examples of intimidation, exclusion and violence including sexual harassment and humiliation particularly by the boys but also by the teachers. This paper has raised concern that the online teaching environment should not be allowed to compound these problems but serve as a tool for liberation of all as they gain increased equitable access to knowledge and it empowering effects

CONCLUSION

The analysis above demonstrates that gender considerations have serious implications for technological change. Not only is the socio-cultural environment gendered, technology itself is also gendered. The gendering of both environments has been fostered through the biases and limits that emerge from and imposed from the systems and their actors. In the recent craze for the adoption of ICT by higher education institutions for learning and teaching, their gendered implications can not be ignored. The institutions will need to recognize, account for and endeavor to incorporate gender

concerns in programme designs and adoption of technologies in order to circumvent the re-inscription of undue gender discrimination while offering opportunities for equitable access and benefits from the online technologies that are being proposed and adopted for use.

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