



An Analysis of Academia Perceptions of Effects of Mainstreaming E-learning on Gender/Socio-Cultural Minorities in Zimbabwean Universities

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Authors' contributions

The two authors designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

The cumulative advances and innovations in digital technologies, coupled with the evidence that learners entering tertiary education today have changed fundamentally in their learning needs/styles have awakened us to the realities of new learning landscapes which are emerging around us [1]. E-learning system promises a new way of delivering education. However, the need to ensure e-learning system success becomes imperative. After 65% of the students failed to voluntarily register for an e-learning blended programme, in three universities, this research set out to find the challenges of mainstreaming e-learning in the Zimbabwean context. This was a survey of a purposive sample of 60 students and 54 university lecturers from three universities who are part-time tutors of the Zimbabwe Open University. The study found out that the divisive vectors of race and inequality appear to re-emerge via technology which is at best stagnating and at worst putting gender/socio-cultural minorities at the margins owing to the dilapidated infrastructure, the digital divide that characterize students in the universities under study, lack of teacher competencies and challenges of accessing electronic materials. In such instance, e-learning was

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seen as the monster under the bed and technology adoption acceptance is grossly affected. The study argues that historical, technological, social, political and economic challenges appeared to be inextricably linked and appear in a different form. Thus, the research recommend the need to enable the technological possibility for students to be masters of their own destiny by changing the way they live, work, organise, communicate and interact.

Keywords: E-learning; mainstreaming e-learning; technology infrastructure; gender/socio-cultural minorities; vectors of race.

1. INTRODUCTION

According to [2], e-learning refers to the use of electronic media and information and communication technologies (ICT) in education. This e-learning, is broadly inclusive of all forms of educational technology in learning and teaching. Some of the forms of learning that fall under and are broadly synonymous to e-learning include multimedia learning, technology-enhanced learning (TEL), computer-based instruction (CBI), computer-based training (CBT), computer-assisted instruction or computer-aided instruction (CAI), internet-based training (IBT), web-based training (WBT), online education, virtual education, virtual learning environments (VLE), m-learning, and digital educational collaboration [2]. You will find that in some literature all these are called learning platforms. These alternative names emphasize a particular aspect, component or delivery method. E-learning is a broadly inclusive term that describes educational technology that electronically or technologically supports learning and teaching.

1.1 ICTs

Information Communication Technologies (ICTs) as illustrated in Diagramme 1, are the backbone

of e-learning. [3], a pioneer of e-learning, advocates that the "e" should be interpreted to mean "exciting, energetic, enthusiastic, emotional, extended, excellent, and educational" in addition to "electronic." This broad interpretation focuses on new applications and developments, and also brings learning and media psychology into consideration. According to [3].

- The exploding new media and communications environment has implications for the future of both pupil and adult learning as media, technology, and learning psychology increasingly become tools for learning in and outside the classroom.
- The new research area of media studies, i.e., the study of media effects, includes media psychology because an understanding of human behavior is vital to the effective use of technology in education.
- The "e" in e-learning means much more than "electronic" when applied to e-learning — think instead of a big "E" for "exciting, energetic, engaging, extended" learning.

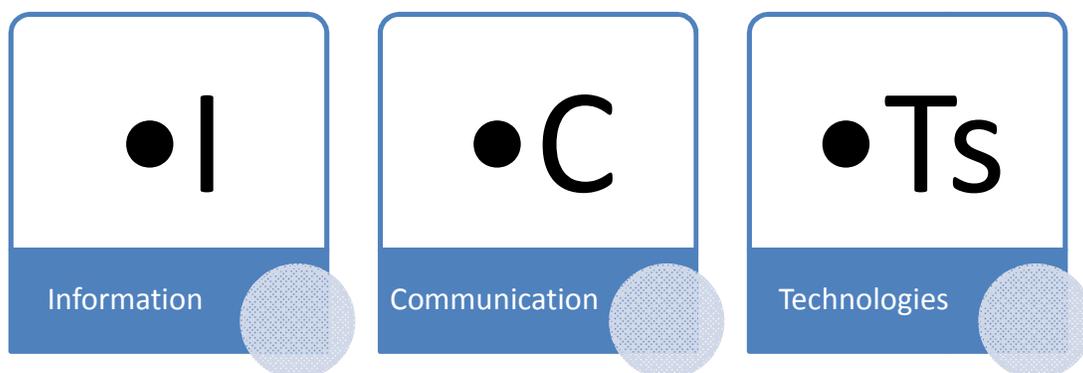


Diagram 1. Diagram showing Information and Communication Technologies that are the backbone of E-learning

We are currently living in a knowledge society. In such a society, technology, globalisation, and new knowledge about how people learn are having dramatic effects on diverse approaches to teaching and learning worldwide [4]. Most of the literature about these changes refers to physical technology. This may include gadgets such as computers, iPods, iPhones, MP3 players, and the overall proliferation of gadgets and gizmos. To many, the “e” means electronic, but [4] asserts that the “e” means *more* than electronic when applied to e-learning. It actually means “exciting, empirical, empathetic, extra, emerging, energetic, exceptional, early, eloquent, everywhere, ephemeral, extended, effortless, epic, evangelistic, eclectic, engaging, extended” learning — and more. The point is that e-learning may be individual, tutorial, a significant part of a mentoring process, and a tool for personal communication that is not well understood. I want to help make the case that there is a new learning psychology in which the “e” has vastly broader implications

1.2 Synchronous and Asynchronous Platforms

According to [5], in e-learning, we can have either synchronous or asynchronous platforms. Synchronous learning occurs in real-time, with all participants interacting at the same time, while asynchronous learning is self-paced and allows participants to engage in the exchange of ideas or information without the dependency of other participants’ involvement at the same time. Synchronous learning involves the exchange of ideas and information with one or more participants during the same period of time. A face-to-face discussion is an example of synchronous communications. In e-learning environments, examples of synchronous communications include online real-time live teacher instruction and feedback, Skype conversations, or chat rooms or virtual classrooms where everyone is online and working collaboratively at the same time. Asynchronous learning may use technologies such as email, blogs, wikis, and discussion boards, as well as web-supported textbooks, hypertext documents, audio video courses, and social networking using web 2.0 [5].

1.3 Some Benefits of Technology

There is wide spread convincing documented evidence that technology has befitted institutions. For instance, [6] is of the opinion that there are

many benefits of intranet implementation. Among the major ones include ability of the technology to facilitate internal communication, secure, enhanced productivity, reduced cost, and faster delivery. It is for these advantages that many corporations worldwide have flocked towards adopting intranet [7]. However, what remains problematic are the findings of [8] and colleagues that while intranet has been adopted by various sectors for many years, there is still insufficient research concerning the relationship between intranet usage and its impact on performance of managers. They argue that many of prior studies are fragmented and therefore, a conclusive finding is yet to emerge. The lack of comprehensive research has made intranet implementation in practice a problematic issue in terms of generating user acceptance. This is also the case with e-learning. This grey research area prompted this study.

According to [9], the challenges of gender, age and personality in e-learning pose serious drawbacks to mainstreaming e-learning. They argue that technological advances in the fields of information and communications technology have allowed the creation of a range of new digital technologies that can act as a vehicle for human expression, communication and behaviour. To [9], these new digital technologies pervade all aspects of life and this worldwide technological revolution raises fundamental questions about how these changes impact on the lives of all who use these systems, whether it be for education, communication, entertainment or creative expression. They then claim that one of the long-term conceptual challenges that face those involved with digital learning is the goal of documenting, understanding and developing solutions that are sympathetic to the many and varied individual, group and cultural differences that exist within the user populations. Against this background, this research sought to find out if the challenges affecting mainstreaming of e-learning in Zimbabwe are not putting gender/socio-cultural minorities on the margins.

1.4 Guiding Framework

This research was guided by [10] eight dimensional e-learning framework. This framework provides a structure for systematically reviewing e-learning initiatives and programmes, so that desired learning outcomes are achieved. This framework is composed of eight dimensions, each reviewed by practical checklists of 50 - 70 questions. The checklist

does not include a scoring system, but serves as an instrument that verifies that each area is cultivated. This E-Learning Framework consists of 8 dimensions, sometimes referred to as factors. Each dimension represents a category of issues that need to be considered in order to create successful e-learning experiences. These dimensions are pedagogical, technological, interface, evaluation, management, resource support, ethical and institutional dimensions. These dimensions are studied in detail below.

It has the pedagogical dimension which addresses issues such as content analysis, audience analysis, goal analysis, design, and methods and strategies [11]. Technological dimension assess the principles and methods of instruction which include teaching and learning. It addresses how the content of a course is designed; identifies the learner's needs; and how the learning objectives will be achieved. It is this dimension that addresses the delivery method for the course activities and the appropriateness of the online environment for achieving the learning goals of its intended audience. The technological dimension assesses the hardware, software, and infrastructure planning [10]. It also addresses issues pertaining to the selection of the most suitable learning management system (LMS) and communication tools (i.e., audio and video conferencing platforms) for achieving the institution's learning goals and objectives. Technical requirements such as the server capacities, bandwidth, security, backups, and other infrastructure issues are also addressed under this dimension. The interface design dimension addresses five sub-dimensions that pertain to the overall look and feel of an e-learning course or programme. These include web design, content design, navigation, accessibility, and usability testing [11]. For online learners the user interface is the first thing they see when they login to a course. The first impression students get from a course or programme is often based on the site's user interface appearance and ease of use. You may see that user interface has a great bearing on technology acceptance.

The *evaluation* dimension addresses the assessment of learners; evaluation of the instruction and learning environment; assessment of content development processes and of the persons involved in the design process. This includes the planning team, design team, production team, and evaluation team. It also includes review of instructional design

processes which entails planning, design, development and evaluation. It also touches on the evaluation of e-learning at the programme and institutional level. The *management* dimension addresses the continuation, updating, and upkeep of the learning environment. This continuation may be used to determine whether the e-learning atmosphere is performing adequately, and whether the instruction is meeting its intent. This dimension also addresses issues of quality control, budgeting, staffing, security, and scheduling. The *resource support* dimension considers all of the technical and human resources support required to create meaningful and successful online learning environments. The *ethical* dimension addresses issues pertaining to social and political influence, diversity, bias, the digital divide, information accessibility, etiquette, and legal issues. Legal issues include privacy, plagiarism and copyright issues. The *institutional* dimension addresses three sub-dimensions these include issues of administrative affairs, academic affairs and student services related to e-learning. Other administrative affairs relate to admissions, financial aid, registration and payment, informational technology services, graduation, and grades. Academic Affairs refers to accreditation, policy, instructional quality, faculty and support staff, and class size. Student services is a wide field that covers everything from counseling and library support to book store, internships, and alumni affairs. Before a fully online programme is launched, each of the aforementioned issues must be addressed for a smooth implementation. It is against this background that this research sought to find out if there are any challenges in mainstreaming e-learning in Zimbabwe. It did not stop there. It went further to find out if the challenges were not related to other social evils such as race, ethnicity, gender and geographical location.

1.5 Research Question

This research was directed by two research questions. These are:

1. What are the challenges of mainstreaming e-learning in Zimbabwe?
2. Are these challenges putting gender/socio-cultural minorities at the margins?

2. METHODS

This was a survey of a purposive sample of 60 students and 54 university lecturers from three

universities who are part-time tutors of the Zimbabwe Open University. The research collected qualitative data through an open-ended questionnaire that was analysed thematically.

3. FINDINGS

This section presents the findings of the study in a frequency table. The main issues that were raised by the respondents are presented below in Table 1. N=114.

3.1 E-learning Functionalities

One major finding of this study was the issue of technology functionality. Both lecturers and students concurred that the issue of functionality should be addressed in Zimbabwean universities. One respondent even said:

Our university is currently experiencing challenges, intricacy and even failure in transferring IT into practice.

Challenges related to e-learning functionalities appeared to affect technology acceptance in this case. According to [7] and colleagues [8], this could serve as a primary reason as to why top management of organizations, both public and private constantly question whether such investment leads to expected desirable outcomes, which makes successful intranet implementation more difficult to achieve. In E-learning, there are three important technology functionalities. According to [7,8], these are physical interface, immediacy of communication and concurrency. What this means is that physical interface such as speed of line is considered an important technology functionality that could influence the fitness of the technology itself. For instance, if the line is slow, it could affect student performance in their studies and

subsequently their perception that the technology is not useful in meeting their task requirements. This was the case in this study in spite of the fact that [12] argue that leaner technologies such as voice mail and e-mail offer the ability to communicate asynchronously so that even if the parties are not readily available, communication can still occur and may often prove to be a faster way to complete a task than attempting to find a shared time to communicate.

3.2 Late Faculty Adopters of E-learning

A very interesting finding in this study was an allegation that the teaching staff was full of late adopters of technology. One lecturer from a conventional university remarked that:

“For the majority of us that teach both Internet-based classes and traditional classes, it has been a real challenge balancing the time commitments between the two modes of delivery.”

A student concurred and alleges that new tutors and lecturers from colleges appear generally to be marginally less technologically sophisticated.

It is clear that staff can affect technological acceptance. It becomes worse if the staff is marginally less technologically sophisticated as was the case in this study. [13] appear to support this finding by claiming that early faculty adopters of e-learning tended to be more cutting-edge “pioneer” types, and as such they were highly motivated to make it work. It’s not at all surprising that the next wave of adopters are somewhat less motivated and/or appear less equipped to address the issues inherent in offering world class e-learning experiences to the students.

Table 1. Showing factors limiting participation of socio-economic minorities. N=114

Issue raised by respondents	No.	%
E-learning functionalities	102	89.4
Late faculty adopters of e-learning	97	85.1
Technical limitations	83	72.8
New era of educational inequity	76	66.6
Learning oriented social software limiting ability to connect and navigate	81	71.1
Pedagogical aspects of ICT	47	41.2
Double edged role of ICT	39	34.2

3.3 Technical Limitations

Both tutors and students concurred that they have technical limitations that pose challenges to their e-learning platform. According to [13], when designing e-learning courses, instructors must consider students' technical limitations. This may include limitations associated with bandwidth and computer hardware. In this study, one respondent opined that:

In our university for instance, some tutors create Web pages with too many graphics. This is not a problem for students who are resident on campus but many of us are distance education students and we live off campus. Many of us have varying degrees of online access and bandwidth. Not all teachers do this because some who are marginally less technologically sophisticated do not do this.

The issue of technical limitations affecting staff and students appears to be a big challenge. It appears this challenge is not confined to Zimbabwe. [13] also observed that instructors might also develop courses using large monitors, while students will display the pages on smaller monitors. On the other hand, some well known online global leaders have side stepped this challenge. To serve its global online student population, the University of Phoenix designs its online courses with the dial-up user in mind. Most courses use text-based materials and require extensive online text-based discussions. The institution shies away from any high-bandwidth material or activity. This was not the case in the Zimbabwean universities in this study. Staff create web pages with too many graphics yet their students and colleagues have technical limitations.

3.4 New Era of Educational Inequity

While [14] who argues for the use of technology raises the point that improved technology has strengthened the positions of those on the offensive to see quality of education in open and distance learning. He takes a historical position that:

'Libraries based on clay documents enabled the priest-base monopoly of knowledge in ancient Babylon. The invention of papyrus scrolls and the alphabet was key to the limited democracy of Greek city states and the rule of law in ancient Greece. The improved portability, ease of use and durability of

parchment-based, bound books created by the papacy and monastic orders were critical to the speed of conversion to Christianity' [12].

In this study, the finding was that on the ground, the availability and use of technology is uneven. In this context one prominent educator has this to say:

A new era of educational inequity was slowly emerging as a result of using ICT in open and distance education. The dilemma is that the greater the dependence on technology, the greater the inequities created.

This study unearthed a new era of educational inequity brought about by technology. A host of challenges such as availability of funds to buy modern technology, availability of experts and effective utilisation of ICT all team up to make technology 'not reachable' to the generality of the public [15]. Lack of training in and aversion to the use of technology is another reason compounding the challenges in the use of technology in the universities under study. The Zimbabwean universities appear not to be alone in this inequity equation uncovered in this study. [16] in a study in India found out that the majority of learners do not have access to the Internet at home even though there is large scale expansion of Broadband services in India. In a related study in China, [17] has questioned the merit of applying advanced information communication technology (ICT) in developing countries where children and adults lack even the most basic living standards. He argued that in these countries, traditional technologies such as print media, radio and television remain more effective because the high cost of Internet service prevents poor people from accessing it. [18] says that Internet connectivity is important, yet the proportion of people on line is only 4% in India, 1% in Africa (half of them in South Africa) and 0.1% in Bangladesh a developing country like Zimbabwe. Though this picture is gradually changing, for now it is a paradox and a challenge to mainstreaming e-learning in Zimbabwe and a potential source of educational inequity.

3.5 Learning Oriented Social Software Limiting Ability to Connect and Navigate

The need for learning oriented social software was cited as a challenge in this study. To the respondents, learning oriented social software was limiting ability to 'navigate'. Both staff and

students appeared to concur that learning oriented software is limiting the ability of staff and students to connect. Some relevant statements were:

Learning oriented software is limiting our abilities to connect. The learning institutions need to look into this issue.

Information technology must be used to promote the idea that teaching is about being a wise companion. This means social software is needed to enable students and the university to interact.

We need to consciously and intentionally create new patterns of relationships through the use of appropriate technology.

It appears from the above excerpts that the major challenges were on the absence of software that support constructivist teaching and learning. Constructivist teaching and learning says that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences. What this implies is that when we encounter something new, we have to reconcile it with our previous ideas and experience, maybe changing what we believe, or maybe discarding the new information as irrelevant. In any case, we are active creators of our own knowledge. To do this, we must ask questions, explore, and assess what we know. Constructivist teaching and learning as an underlying pedagogy, is supported by [19] who argues that *social software tools* can support a social constructivist approach to e-learning by providing students with personal tools and engaging them in social networks, thus allowing learners to direct their own problem-solving process. Social constructivism emphasises the importance of the learner being actively involved in the learning process, unlike other educational viewpoints where the responsibility rests with the teacher to deliver knowledge while the learner passively receives it.

According to social software seems to match well with modern thinking about educational practice. In particular, it promises learners of new opportunities to be independent in their study and research. Social software tools encourage a wider range of expressive capability. They facilitate more collaborative ways of working and they furnish a setting for learner achievements to attract an authentic audience. To encourage these possibilities, social software tools have

evolved that create distinctive forms of support for learning and for independent research. Further arguments for social software are that it is seen to accord with modern views on the deeply social nature of human mentality, no matter what the age of students, as demonstrated in the Horizon Project. This further demonstrates that the motivation for using social software tools and technologies is not restricted to higher education. [20, p. 5] talks of *connectivism* by saying that the learning process: “. . . is focused on connecting specialised information sets, and the *connections that enable us to learn more are more important than our current state of knowing.*” He also states that: “connectivism is driven by the understanding that decisions are based on rapidly altering foundations. New information is continually being acquired. The ability to draw distinctions between important and unimportant information is vital. The ability to recognise when new information alters the landscape based on decisions made yesterday is also critical” [20:5]. [21] concurs and adds that constant connectedness is a given circumstantial reality underpinning learning environments in a navigationist paradigm. To “connect” and to be/stay connected is part of the skill to “navigate”. This is the reason why respondents in this study concurred that the absence of learning oriented social software limits their ability to ‘connect’ and ‘navigate’.

3.6 Pedagogical Aspects of ICT

All state universities in Zimbabwe have been applauded for having computerised. However, respondents in this study thought this was not enough to mainstream e-learning. It was the contention of the respondents in this study both staff and students that it is not enough just to provide computers. The most important part they thought could continuously improve quality is the pedagogical aspects of ICT. To them:

Pedagogical aspects of ICT that the universities pay less attention to, have capacity to provide the foundations of ICT use in e-learning.

There must be a course that introduces students to online learning.

It is important to design support courses that promote collaboration so that students experience what learners in online courses typically experience.

To put effect to the pedagogic aspects of ICT, the respondents proposed a model that appeared to be similar to the [22] model. One lecturer opined that her university need to:

Use constructivist learning to create multi-media learning resources

Constructivist learning appears to corroborate [22] model of learning. This model suggests the provision of a range of resources, tools, and supports within the learning environment to assist learners to engage in authentic activities such as projects, solving problems, solving cases and others [22]. Thus, creation of multi-media learning resources was seen as a way of mainstreaming e-learning. Authenticating statements are:

Learners must be able to use technology to analyse situations and solve cases. (Lecturer)

'We need to engage in activities that enable us to explore the situation using various technologies.' (Student)

The university has computerised its systems, this is acknowledged. However, we need not only computers, but multi-media learning resources.

The missing link here appears clear, use of [22] model of constructivist learning or something nearest to it to create multi-media learning resources for the benefit of staff and students. Constructivism taps into and triggers the student's innate curiosity about the world and how things work. Students do not reinvent the wheel but, rather, attempt to understand how it turns and more importantly how it functions [21]. They become engaged by applying their existing knowledge and real-world experience, learning to hypothesize, testing their theories, and ultimately drawing conclusions from their findings.

3.7 The Otherness of Technology

While the debate regarding the regeneration of Zimbabwean universities through technology rages on, new thinking emerged from this study that questioned the role of the information highway. The divisive vectors of race and inequality appear to re-emerge via technology. In this regard, the majority of students and some few staff members took the position that (to quote a respondent):

Mainstreaming e-learning in universities in Zimbabwe is at best stagnating and at worst putting gender/socio-cultural minorities at the margins.

One even said it is (in his/her words) *atrophying*. They cited the double edged characteristic of technology and its monster jacket as real dangers to mainstreaming e-learning.

3.8 Double Edged role of ICT

It was the contention of the respondents in this study that ICT is a double-edged sword. They pointed to the double-edged role of ICT, claiming that ICT can be a facilitator of learning opportunities and at the same time a potential risk to learning opportunities, owing to the dilapidated infrastructure and the digital divide that characterise students in the universities under study. Some supporting arguments were:

The dilapidated ITC infrastructure in some of the universities means lecturers and support staff will be frustrated in their efforts to mainstream e-learning. It is inappropriate to shuffle something as important as access to educational opportunities through technology to the periphery.

'There are promising initiatives in all the universities that can be utilised to promote e-learning. However, the digital divide that exists among the students in various situations risks increasing the gap between the havenots and the affluent ones if efforts are not made to bridge it. As it stands right now mainstreaming e-learning through technology is atrophying.

Technology was also labelled the **monster under the bed**. This is because the digital divide between the rural based, the urban based and the gender/socio-cultural minorities led one of the respondents of this study to call the computer the **monster under the bed**. She claimed that:

My access to the computer is almost zero %. I therefore cannot recommend to the university a monster under the bed to be the main teaching instrument. These sentiments were echoed by another respondent who argued that:

*Given the digital divide between communities, technology is putting **minorities at the margins**. It has helped create this depressing and dangerous situation because historical,*

technological, social, political and economic changes are inextricably linked.

What appears loud and clear challenge related to the issue of equity is *orchestrating discrimination* in the form of technology. Education is a form of equalising opportunities that is seen by many as a transformative vehicle for increasing the pace of change and reform in higher education [23]. However in this study, a new form of discrimination in the form of technology has been unearthed. It may be severe for the under privileged students like women, as it comes at a time when the Los Angeles times quoted in [12,24] reported that the nation must face up to the fact that women are leaving or avoiding computer careers in droves, citing discrimination by co-workers, few role models, family-unfriendly work environments and a general sense that the field is irrelevant to their interest.

4. CONCLUSION

This research concluded that given the major role of computer science, technology and information and communication technology in teaching and learning, it appears mainstreaming e-learning in Zimbabwean universities is facing a serious threat. It is imperative that the universities need to begin to take e-learning platforms as more of a knowledge market place than an ivory tower. Otherwise the study found it as a way of masterminding the idea of putting gender/socio-cultural minorities on the margin.

5. RECOMMENDATIONS

This the current research on challenges of mainstreaming e-learning in Zimbabwe has built upon the currently available knowledge, given the limited sample size and scope, the interpretation of the research result has been done cautiously. However, the study recommends that future studies should include a bigger sample size and be conducted across different countries to find out if e-learning is not putting gender/socio-cultural minorities on the margins. It is also warranted for future studies to look at aspects of culture, race, gender, technology resistance and user satisfaction.

- harmonising of ICT efforts across different gender and socio-economic groups.
- Piloting of the chosen E-learning model before it is implemented
- E-learning tutors need to continuously upgrade their skills and keep abreast of the latest developments and best practices so

that they do not disadvantage other groups in society

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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