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Combining feminist pedagogy and transactional distance to create gender sensitive technology enhanced learning

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Abstract

In this paper, we argue for a new synthesis of two pedagogic theories: feminist pedagogy and transactional distance, which explain why and how distance education has been such a positive system for women in a national distance learning university. We illustrate this with examples of positive action initiatives for women. The concept of transactional distance allows us to explore distance as a form of psychological and communication space, not simply of geographical distance. Feminist pedagogy, on the other hand, has recognised the importance of gender in structuring disciplines as well as teaching strategies. Both theories implicitly position the face-to-face classroom as the ideal learning environment, with the implication that distance learning has to produce a deficient environment. We argue that the evidence for women does not support this and present examples of feminist distance learning provision that has offered successful technology-enhanced learning and educational opportunities.

Introduction

Historically distance education programmes have been very attractive to women; and women students have been very successful in their distance education studies. Yet theories of feminist pedagogy and of transactional distance in education would suggest that women students would be alienated by distance education methods and struggle to succeed. In this paper we explore how distance can, for women students, provide an opportunity to engage with learning, and if we understand the affordance provided by distance we can use it creatively to develop a new feminist pedagogy that brings gender sensitivity to technology enhanced learning.

Historians usually trace the origins of large scale distance education to the nineteenth century (Holmberg, 1995) when the combination of widespread literacy, low cost printing and reliable postal systems provided the ideal environment for the development of 'correspondence education'. Women who were either excluded formally from educational institutions or informally by their responsibilities in the home were some of the earliest distance learning students. Anna Ticknor is credited with being the first person to try and personalise distance education in her Boston- based Society to Encourage Study at Home. She encouraged teachers and students to write to each other, as well as engaging with the monthly guided readings and tests that formedⁱ the curriculum. When the Open University UK (OU) was established and began to deliver courses in the early 1970s, women very quickly became a majority of the student body, as well as having better course completion rates than male students (Woodley & McIntosh, 1980). The large scale enrolment of women in distance education in the UK and elsewhere was unexpected but can be explained by women's prior lack of opportunity to engage in other kinds of education (Lunneborg, 1994) but women's successful completion rates need more explanation. At a time when, all over the world, distance education institutions were being established, and hundreds of thousands of women were registering for and completing programmes of study taught by distance methods, a theory and practice of feminist pedagogy was developing that behaved as if all teaching involved a face-to-face classroom experience. Late 20th century feminist pedagogic theory argued that education was inherently gendered as a cultural institution

and that radical pedagogy needed to explicitly develop critical consciousness in students (Freire, 1973) through group discussion (Thompson, 1983). Critical consciousness was often described as 'consciousness raising' in 1980s feminism, and usually seen as a crucial aspect of feminist pedagogy. At first glance it would seem to be impossible to create the opportunity for the kind of consciousness raising activities promoted in the feminist education literature in distance education because of the structural difficulties of enabling the kind of interpersonal interactions that were common to many early feminist classrooms (Culley & Portuges, 1985). The success of women students in early paper based distance education models brings into question this emphasis on interpersonal interaction, as being a key condition for feminist pedagogy

The challenges for interpersonal interaction identified in feminist theory were also identified in the field of distance educational theory as 'transactional distance' (Moore, 1997).

Transactional distance theory argues that it is not spatial or temporal distance (in distance learning) between learners and teachers per se that matters but it is the interruptions that these cause in communication (i.e. the two way 'transactions' between the learners, the teacher and the content) in which misunderstandings can develop and grow. Both transactional distance theory and feminist pedagogy have at their core an implicit assumption that the ideal learning environment is one where teacher and students are co-located in time and space; and that it is this co-location that offers the best opportunity for clear and open communication amongst everyone engaged in the learning process. While feminist pedagogy addresses the nature of gendered power in this classroom context, transactional distance theory does not. One kind of 'distance' produced in face to face transactions is that of gender/power. This has been described by social theorists such as Hofstede (1998) as the social distance created culturally by gender, and by feminists as the male power which culturally silences women and limits women's autonomy. This power has been exercised through all other cultural institutions including educational institutions.

In this paper we draw on empirical evidence from the OU, to challenge both feminist pedagogy and transaction distance theory to explain why distance learning initiatives have been so successful for women. We suggest that geographic or spatial distance can be a

positive factor that can serve to decrease other aspects of transactional distance that can occur in one to one or group communication, in particular those that create alienation and the silencing of women produced by the operation of unequal gender/power relations, between teachers and students and amongst students. For women historically (and in some countries still in the present day) the operation of gender/power has excluded them from education and even when women get access to education gender power can negatively impact on their performance. Feminist pedagogy has promoted women only spaces as the learning design solution to the negative impact of gender/power, however, we argue that distance education can produce, and has produced, other kinds of learning designs that use the positive aspects of 'distance' to allow women to overcome the negative aspects of gender/power in a mixed sex learning environment. The danger in both transactional distance theory and feminist pedagogy, of focusing on increasing the social and communication activities of education through the use of other media, could in fact increase the negative effect of gender/power on women if the positive aspects of spatial and temporal distance are not understood.

Transactional Distance.

When 'first generation'ⁱⁱ distance learning programmes were set up the term 'distance' was used in its common sense geographical/spatial meaning – i.e. that students and teachers were located a long way from each other. This distance was initially bridged by 'correspondence': the printed content materials that were sent to students, and later communication that also included broadcast radio and television programmes. It was also bridged in the way that students their teachers/tutors and assessors corresponded with each other via, for example, exchanges of documents: letters, course work, assessment feedback, and later by telephone and by face-to-face tutorials. By the 1970s Moore (1973) was theorising the nature of this distance as beyond the simple spatial. He identified the various separations (such as that between teacher and student), produced by geographic distance and labelled these examples of 'transactional distance'. Transactional distance he argued is 'a psychological and communications space to be crossed, a space of potential misunderstanding' (Michael G Moore, 1997, p. 22). He identified three aspects of

education in which transactional distance have a detrimental impact on student engagement: it can interfere with positive dialogue which is influenced by the medium as well as the design of a communication and the behaviour of those communicating; it can limit learning design or programme structure which involves communication and dialogue, and finally it limits learner autonomy which is about the extent to which any learner is able to take responsibility for his/her own learning.

The literature on transactional distance has never suggested that there could ever be circumstances in which this distance is beneficial to the learner; the presumption has been implicit that separation has only negative consequences. Yet for many groups of learners who have been disempowered in traditional educational systems (including some social and racial groups, and people with disabilities, as well as women) distance education has had very positive consequences. Distance education literature has focused on exploring the negative impact of transactional distance, by comparing measures such as student completion rates for courses taught by distance learning compared with face to face methods. The lower completion rates for distance learning is identified by Simpson as part of the cause for what he (2013) has called the 'distance education deficit'. However, both Moore and Simpson argue that this deficit can be overcome by appropriate interventions in student support systems, and by better use of new media. What this critical position on distance has not been able to explain is the very high ratings that the OU has received from students completing the UK National Student Survey ⁱⁱⁱ. The University has received overall student 'satisfaction' ratings that match those of the most prestigious face-to-face universities in the UK, as well as scoring the highest for student satisfaction with assessment and feedback from tutors. There has also been less work done comparing the performance of different kinds of students within a distance education context and the most recent work has focused on the use of large data sets to predict individual student success rather than an analysis of particular factors contributing to it (Prinsloo, Slade, & Galpin, 2012)

Since the advent of internet based distance education the stress has been on bridging transactional distance through technological and design solutions. The newest work on learning analytics follows this trajectory. It has been argued that we need instead to look at

different 'generations' of learning theory (i.e. cognitive-behaviourist, social constructivist, and connectivist pedagogy (Dron & Anderson, 2012) to avoid seeing both the problem and the solution as technical. Researchers have also not accounted for the successful student who uses the 'separation' inherent in distance learning in a positive way, to create space for reflection, to disengage from non-productive power relations in the learning context, to self-manage their time and energy. These positive attributes of transactional distance have, we argue, been beneficial for women in our institution, and in many places in the world such 'separation' has allowed women to engage with education without having to engage with the highly gender discriminatory nature of male dominated learning environments.

Feminist Pedagogy

Feminist pedagogy has its roots in the liberation theories of adult learning (Freire, 1970, 1973) and in the small group methods used for the sharing and analysis of experience – labelled consciousness-raising; some of which was politically oriented and some of which came from the humanistic psychology, and reciprocal peer-counselling movements of the 1960s (Rogers, 1961). Added to this were feminist critiques of mainstream psychology (Belenky, Goldberger, & Tarule, 1986; Gilligan, 1982). From the viewpoint of 2015 feminist pedagogic practices can look very like constructivist learning but only if the political and ideological underpinnings of feminist pedagogy are forgotten – especially its rationale for action: to challenge gender power.

There is a consistent ideological framework to feminist pedagogy (Webb, Willen, & Walker, 2002). Morley (2002) has an excellent summary of this. The central core of feminist pedagogy, she argues, is a challenge to the authoritarianism of 'masculine' modes of pedagogy. It has an emphasis on the creation of knowledge through dialogue and includes reflexivity by the learner. Pedagogy is a social as well as cognitive activity and there are always connections made between pedagogical dis/empowerment and socio-political power: i.e. knowledge is power. Feminist pedagogy is driven by emancipatory intentions. Personal /experiential knowledge is often valued as highly as abstract/propositional knowledge. There is an emphasis on the links between personal and social change.

Interconnections between ideology, power and culture are made visible and challenged within and outside the classroom. A feminist teacher accepts that educational practices, as well as knowledge, are socially constructed, and action, including that of teaching, should be informed by critical engagement with theory (praxis). The traditional feminist classroom emphasizes participation and negotiation (hooks, 1994, 2003). Students are invited to see themselves as shapers of knowledge and learning. Feminist academic practice crosses the boundaries of disciplines. There is an emphasis on the links between personal and social change. Feminist pedagogy looks only at individual student autonomy primarily within the perspective of the overall gender power relations of society. However, as Henderson (2013) notes, feminist pedagogy is an evolving approach and not a fixed set of attributes “Rather than reduce feminist pedagogy to a single, fixed list of characteristics, with a canon of authoritative references to follow up ... feminist pedagogy [is] fragmented, .. Originating from and belonging to different people and places... a continually developing phenomenon that invites teachers and students to contribute to its evolution” (Henderson 2013).

Distance education as a form of feminist pedagogy has not always been visible to those theorists and practitioners who focused almost exclusively on face-to-face classrooms. . This concentration on face-to-face engagement, and synchronous communication focuses attention on interpersonal interactions see Crabtree et al. (2009) This has been picked up by feminist educators who have experimented with using innovative learning technologies such as virtual worlds to provide an enhanced sense of presence that enables supportive group interactions Feminist pedagogy we argue, needs, to embrace the potential of distance education to reach, and teach women (and men) in different ways, and –like transactional distance theory - it needs to move beyond a notion that distance has always been disadvantageous. Creating more opportunities to interact using new media could simply result in strengthening unequal gender/ power relations that had been positively weakened by the reduction in synchronous interpersonal communication in earlier forms of distance learning.

There has been a danger that feminist pedagogy has become restricted to being a discourse of resistance to the system, rather than a source of tools and strategies for producing liberatory education for women that take advantage of the system. The focus on face-to-face learning and teaching and on the interpersonal interactions of students and teachers has implied that other kinds of non-classroom educational experiences were less valuable. This has meant that learning mediated through other media: print, broadcasting, and more recently information and communication technologies (ICTs), has been seen as of minor interest or importance, even non-feminist. However, the creation of transactional distance through distance learning methods can effectively bypass some of the gender power relations that often exist in traditional classroom settings, distance learning can be a form of feminist pedagogy. Moore and others writing about transaction distance have presumed that classrooms are places of positive dialogue, while feminist educators know that this has not been the case for women. Interactions between teachers and students have had a negative impact on learning. Feminist pedagogy acknowledges this but creates strategies for changing the environment inside the classroom. It rarely takes the more radical position of arguing for an alternative to the classroom. Yet this might be where feminist educators could make the more radical impact. It was interesting, for example, to see in the early days of the OU the relatively large numbers of women studying traditionally male subjects like engineering, because they could do so 'privately' without having to overtly challenge the traditional gendering of subject areas through their embodiment in a traditional classroom, and as we show by the examples we discuss later in the paper, science, technology, engineering and maths (STEM) subjects have been where distance education has been particularly successful for women.

At this point we acknowledge that educational policy advocating women's distance education has sometimes been based on anti-feminist assumptions about women's primary domestic responsibilities and women's inability to engage in the public sphere of education. This kind of argument was often drawn from but a pragmatic assessment made by governments or even NGOs. Such a rationale for distance education can reinforce and polarise existing gender roles, and therefore run counter to the aims of feminist pedagogy

(Bergviken Rensfeldt & Riomar, 2010). But we are not arguing for initiatives for women to exist ONLY in distance education – they should be part of a whole movement towards changing societies where women are disadvantaged or trapped by rigid gender norms. It would also seem cruel to argue that special educational initiatives for women should NOT be offered in societies where gender inequality is embedded in other areas. The hostility to single sex distance education also seems to ignore the emancipatory potential of education per se, where the content studied drives social change, rather than the way study is organised. Arguments about the political appropriateness of distance education for women parallels that about single sex education to which we return in a subsequent section.

Positive Action

Feminist staff at the OU recognised from the early years of the institution that women were coming to the University for education to change their lives (Kirkup, 1988). As an institution dedicated to ‘openness’, the University has been willing to design programmes for different student populations where the need was understood. In this paper we focus largely on what has been achieved for women wanting to move into or return to traditionally masculine areas of study and employment.

Positive action as a strategy to support the inclusion of women in areas of learning and work in which they are traditionally underrepresented has close connection with feminist pedagogical approaches and aspirations, and was one of the earliest areas to receive funding for special programmes for women. For example, training programmes and centres to train women in IT and other traditionally male dominated skills were set up in the UK and elsewhere in the EU during the 1980s and 1990s (Page & Scott, 2001; Rommes, Faulkner, & van Slooten, 2005; Vehviläinen & Brunila, 2007). Acquiring non-traditional skills in manual trades and new technologies was empowering not only in terms of the practical skills they offered but also because they served to disrupt gendered expectations (Herman 2001). Having challenged one aspect of their identities and expectations, women often found themselves able to contemplate changes in other parts their lives. This has been a continued

theme reported in the experiences of women studying through distance education (Kirkup & Whitelegg, 2012; Lunneborg, 1994; von Prummer, 2005)

Models of feminist distance education

As we have just argued in the previous section one way to provide for women in any educational space is through single sex education. This has been one of the characteristics of positive action initiatives. The Sex Discrimination Act 1975 in the UK allowed for positive action in education and training to address labour market gender inequalities. This meant that organisations could advertise women-only or men-only training courses for work where it could be shown that few or no people of that sex have done that kind of work in the previous year^{iv}. This allowed for the development of single sex courses in STEM areas of the OU curriculum although not in other areas where you might expect it: such as Gender Studies.

Particularly in technology and manual skills training such an environment provides a transformative space for women to do gender differently away from normative gendered constraints in relation to technological practice (Ellen and Herman 2005). Malcolm, Jackson and Thomas (2011) argue that women-only spaces perform an important role in identity formation for women lifelong learners at key transformational periods - 'learning through participation in women-centred spaces enables resistance through subversive strategies including resistance to ascribed identities and re-construction of new ones' (Malcolm, Jackson, & Thomas, 2011p. 249). For women who are not employed (for example those taking a career break) accessing learning in a women-only space enables the development of self-esteem that is often lost during periods outside of paid work, especially when their primary role as mothers has undermined their professional confidence (Ellen & Herman, 2005; Herman, 2014; Herman, Hodgson, Kirkup, & Whitelegg, 2011).

In technical and scientific fields, single sex education or training is claimed as an emancipatory strategy that frees women and girls from the competitive and critical gaze of men and boys, providing a stepping stone to entering a mixed-sex environment on a more

equal footing. This applies not only to girls but also to older learners and returners. However, in STEM fields there is a danger that such approaches can also reinforce gender stereotypes by labelling women as 'deficient' in technological or scientific skill and emphasising their lack of confidence, therefore falling into the trap that some single-sex distance education provision has fallen into of seeming to support the notion that women are not able to engage equally with men in an educational context. Single sex education and training thus remains contentious, criticised by some as perpetuating gender binaries and inequalities.

More closely targeted initiatives aimed at specific groups of women with shared characteristics and needs (such as women returners for example) seem to produce the best outcomes as they are 'deepening the transformative potential for their target groups' (Sørensen, Faulkner, & Rommes, 2011).

Feminist pedagogical initiatives at the OU

We now turn to consider in detail some of the initiatives developed at the OU to support women, and explore how different models of distance education have been used to achieve feminist pedagogical aims, and at the same time used the positive aspects of transactional distance. Some of these have been focused on areas where women are under-represented in employment such as STEM areas or management roles, while others have been within the gender and women's studies curriculum area.

The earliest scheme offered by the OU for women only was the Women in Technology scheme (WIT). Initially WIT was a scheme to retrain and update women who were graduates in the fields of science, engineering and technology but who had been out of the workforce because of family responsibilities. It was so successful that after the first three years it was expanded to include women who wanted to enter SET work but who had no previous qualifications (Kirkup and Swarbrick, 1986). Women on the scheme were funded to register on OU courses in STEM areas and were allocated additional tutorial support as well as attending a weekend school. The activities of the weekend school, oriented the women to

OU study, and also used well established face-to-face feminist pedagogic classroom based methods to encourage the women to reflect on their own career trajectories, the role of gender in shaping their lives and careers, and in the fields of employment they intended to re-enter. In the 1980s OU distance learning technologies included paper-based materials, television and radio broadcasting, audio materials (on tape) and some computer based activities using networked teletype machines located in local study centres, supported by local tutors. After the single sex weekend school all the women on the scheme studied their SET courses in mixed sex 'tutor groups' receiving exactly the same learning materials as the men. There was concern that this might produce a sense of isolation for students: "This isolation of pre-internet distance education was a well-recognised problem, and a great deal of effort was spent encouraging students to find ways to keep in contact with each other after the residential experience" (Herman, Hodgson, Kirkup and Whitelegg, 2011). However, women in the OU were more successful than men in passing their courses which suggested that, at least in comparative terms with men, this isolation was not a detriment to their study. Women on the WIT scheme were able to study traditionally male subject areas alongside male students without having to be 'embodied' in an overwhelmingly male classroom. This transactional distance from fellow male students, and from the male presence of a teacher, allowed, we argue, the women to have closer and more satisfying engagement with the content of study. WIT ended after six years benefitting over 600 women, most of who returned to employment within a few years of being on the scheme (Kirkup & Swarbrick, 1986).

It would be more than a decade before the OU developed a new initiative for women returning to STEM. In 2002, the UK government commissioned a report about the numbers of women dropping out of and not returning to STEM careers. (People, Science and Policy 2002). As a result, the OU was funded to develop an online course (Return to SET) which between 2005 and 2011 was taken by over 1000 women who were seeking to return to work after a career break. This was the first large scale online course of its kind, and presented the opportunity to adapt previous approaches from face-to-face women's development programmes within an online environment. The course was employment

focused and involved students in assessing their professional and personal needs, and developing their own strategies to return to work. As part of this they were introduced to ideas about the gendering of work in STEM occupations (Herman et al., 2011). The first section of the course consisted of an extended reflection of prior experiences and career achievements, including an analysis of life events that had shaped their careers. This also involved online asynchronous discussions on themes such as work life balance, and in that sense could be seen to be part of the tradition of consciousness raising that had been the mainstay of feminist pedagogical approaches of the 1970s and 80s, bringing personal experiences into the virtual classroom that enabled a deeper understanding of the gendered constraints that had shaped their own careers. For many of the women this sharing of experience and 'being in the same boat' were powerful and transformative processes, even perhaps emancipatory in their impact. This was a model which tried to implement into an asynchronous online environment many of the techniques and activities used in the feminist face-to-face classroom, and with some success, although it is the case that many more women choose not to 'speak' in an online environment than choose to do so in a face-to-face context. The existence of non-speaking 'lurkers' is one that has always been seen as a problem by those designing and running online learning. However, research has shown that many students have very good reasons for 'lurking' and do so while actively engaging in learning. (Preece, Nonnecke, & Andrews, 2004).

Another method or strategy that has been widely adopted to support women into STEM is that of role models. The presence of positive role models who have succeeded in progressing to senior levels in STEM professions increases women's sense of entitlement to combine a career with family care responsibilities (Herman and Lewis, 2012). The Return to SET course materials included the stories of nine women returners, and illustrated their experiences using audio clips and photos, covering practical as well as psychological/emotional issues that they had encountered. 'Visiting experts' from industry were invited to question and answer sessions in an asynchronous online forum. This all demonstrates that role models can be successfully presented at a distance through texts, audio and video and that engaging synchronously and face-to-face with them is not a necessary requirement.

The Return to SET courses were short (only 10 weeks long) and followed a tradition of similar short professional development programmes. The first women-only short course at the OU had been a course called 'Women into Management'. This was designed for junior women who were aiming to progress their careers and move into managerial roles. The OU has, through the education it provides in the Business School, enabled many people working in junior administrative positions to progress to more senior management positions. In the 1980s it recruited many fewer women students in this area. In 1987 women were 43% of all OU students on undergraduate courses, but they comprised only 15% of those on finance courses and 33% on personnel courses. Research had indicated that there were many women working in administrative and clerical positions who wanted job promotion but did not have the confidence to embark on a business studies course. They needed a bridge. Women into Management was designed to be that bridge and specifically to provide a bridge to the first level management studies course (Kirkup & Smith, 1987). The curriculum was very similar in content to that of the later women returners courses, although it predated internet delivered learning and was text and video based. As with the Return to SET course it drew on what had been learned from women's development programmes elsewhere and focussed on the personal development needs for women who wanted to move into, or progress in a career. It also included many development activities which aimed to increase the student's confidence as well as help them make a realistic assessment of their skills and development needs. Students also studied a section on the way gender operates in the workplace, to sensitise them to organisation and cultural issues and give them a context to understand their own employment history. This course ran for nine years between 1986 and 1994, over which time 3,065 women studied it.

The discussion of the above courses shows the extent that one national distance teaching university provided emancipatory courses for women leading to career opportunities as well as personal development, and which included feminist content, and variants of feminist pedagogy while taking advantage of the positive aspects of distance.

As well as these courses designed specifically to support women's career development, the OU also ran Women/Gender Studies (WGS) courses. These were not designed to be single

sex courses, and were also open to men, (although 94% of the 8000 students who studied the courses between 1982 and 1999 were women). These courses could be studied as part of the bachelor's degree or taken outside that formal structure, as a one-off course for interest or for professional development. Each course was designed by a team of OU feminist scholars and external experts brought in as consultants to contribute their expertise to specific sections of the courses. These two courses are described in Kirkup and Whitelegg (2012) which examines the challenges produced by these courses and their legacy and in Kirkup, Whitelegg and Rowbotham (2015) which examines the capabilities students developed whilst studying, contextualised within the British educational and employment landscape available to these students as they were growing up.

These courses provided something that was only possible for distance education; the content created for the course was available outside the classroom, to anyone who wanted to access it. The teaching materials were published as high quality study guides by the University and were also available to purchase by the general public. The special produced and collected readings for the courses were co-published as text books by commercial publishers and so were widely available in bookshops nationwide and beyond. This publishing activity gave visibility to the large number of feminist scholars who had worked together on each course over a three year period to prepare the materials for the students to study. These were feminist courses, about feminism and it was expected that the content rather than the learning design would be what transformed the women studying them. It could be argued that this activity was not the co-production of knowledge advocated by theorists of feminist pedagogy, since it did not include contributions by students, but these specially designed texts were a co-production by the teachers of the course, which produced a new contribution to feminist scholarship.

The possibility of open access web publishing now makes it possible for all educational institutions with the resources to open all their materials to the public. The most recent educational initiative for women at the OU is a new Open Educational Resource (OER) entitled Reboot Your STEM Career. This has no assessment, neither does it have a fixed start or end date. As an OER it is open to both men and women and thus operates on a different

model to the previous courses. It is too early say how this will be received or what the take up will be. As with many new models of online education including MOOCs, this OER poses difficult questions about the purpose, impact or efficacy of such efforts. The challenge for feminist educators is to learn from the successes of prior distance learning models and examine how these technological developments and changes in educational models can be embraced and utilised to further women's education, and at the same time expand the notion of what constitutes feminist pedagogy.

Impact on Women Students

We have presented a set of initiatives designed to embody feminist pedagogy in a distance learning context, and discussed the operation of transactional distance in these initiatives; but the proof that these initiatives have been good for women is the outcomes they have. Two recent follow up studies with OU women who had participated in some of the initiatives described above, looked in more detail at impact of the courses in terms of their feminist pedagogical characteristics and aims and to what extent they were able to successfully bridge the transactional distance between the learners and teachers (or indeed whether that made any difference). In each of the cases discussed above, the curriculum was created by a group of feminist practitioners/ educators but not by the students themselves. While the student voice was enabled when the course had a face to face component or an online interactive discussion function, the content was fixed prior to the enrolment of students. However, it would be wrong to presume from this that this content was then absorbed unchanged or undigested by each student. The activities designed for the students and the assessments they did included a great deal of reflection and reflexive autobiographical work (Herman & Kirkup, 2008). This is where each student co-creates the knowledge that she takes away, this is where a student is 'changed' by learning. It is simplistic to locate this only in class room debates.

If we look at focus in feminist pedagogy on the use of experience as a resource, the reflective activities of the STEM courses could be construed as fitting within this category. But in WIT for example where the women were taking part in mainstream STEM modules,

there was little in the way of space for them to use their previous experience. Indeed, we would argue that this can be a particular gendered problem in STEM education as a large body of research has shown that STEM teaching assumes a set of prior experience gained while growing up as a boy with boyish hobbies and experiences – (playing with construction toys such as Meccano or fixing a car engine and more recently playing computer games) and this creates a barrier for women students who do not have similar backgrounds (Margolis and Fisher, 2001). Thus, disciplinary differences can affect the efficacy of feminist pedagogical approaches. So rather than experience, feminist interventions to attract girls to science or technology education have assumed the opposite, that there is limited informal prior experience to build on, but instead transferable interests and aspirations may be more appropriate (such as stressing the social value and impact of STEM careers). Thus, a basic presumption of feminist pedagogy is challenged in STEM education.

There is no question that for many of the women who attended the courses described above, what they experienced was transformative learning, whether this was explicitly from the content of the curriculum or from the learning experience itself. From the recent evaluation of the WGS courses it was clear that many women experienced a sense of empowerment and renewed confidence which they still remarked upon nearly 30 years later. ((Kirkup et al., 2015)

Similarly, students on the Return to SET courses were often affected in life changing ways even though the curriculum did not present as having overtly feminist content. The course was advertised and described as a route back into work. As this student observed they were not coming to learn about gender or feminism.

I'm sure it was completely unintended, but the focus of the course, and the choice of examples and language, have turned me into a feminist (student evaluation – anonymous)

To some extent any women-only courses where the creators are feminists with feminist aims, have such a hidden curriculum. The quote also illustrates that the student understood the intention of the course creators and facilitators namely to raise consciousness of

gendered disadvantage in employment opportunities. Thus as feminist educators we have been visible to the student, she has recognised our intentions even though we had not made these overt, her consciousness was raised, and she understood her gendered position in STEM.

The positive distance of distance education – the newest feminist pedagogy

The experience of the OU distance education courses for women challenges many of those attributes that are usually associated with feminist pedagogy. In examining and analysing how our educational initiatives have engaged with the generally accepted characteristics of feminist pedagogy as outlined, we have identified that our projects do not neatly map onto into these categories and this raises questions about how far these established understandings of feminist pedagogies and characteristics as outlined for example by Henderson (2015) are appropriate to the newest system of learning or to all disciplines. Moreover, we would contend that feminist pedagogy as generally understood has a particular historical location and new theoretical models need to be developed to take account of modern technology enhanced learning environments as well as new practices of learning design. Distance learning is no longer the poor relation of face-to-face education, it is being adopted as central to new designs for learning such as the 'flipped classroom' (Educause, 2012). Distance education has led the field of learning design. Distance is indeed now a positive feature of learning for many institutions.

Feminist criteria for the co-creation of content were developed originally to be used within a particular type of learning environment and embody a rather simplistic notion of content and knowledge. If we see co-creation happening between each individual and content as well within group interactions with content then we free ourselves from the notion that real time interventions by groups of students in class-room equivalent spaces are necessary for learning to be valid.

Our evidence from follow up studies with our students suggests that distance education interventions offered in the OU since the 1980s, have been very successful and have had empowering and sustained impact for many of the participants. We would contend that this is the most important facet of feminist pedagogy rather than any particular 'recipe' of characteristics as earlier writers have suggested.

One of the reasons for the success we have evidenced is, we believe, that distance learning offers potential advantages over face-to-face classroom encounters and allows for the personalisation of learning, and for defusing gender/power distance. Women in distance learning contexts are removed from the male gaze, by not being obliged to inhabit embodied spaces where they are objectified as 'the other' rather than simply being a member of the student group. In situations such as mixed sex STEM classes women's inclusion as a minority gender is less obvious. Distance allows not only for spaces where misunderstandings develop (Moore, 1973; Moore, 1997) but for spaces where disrupting and reflection can take place. This opens up new possibilities of escaping from the domination of male authorities in texts, and in the social behaviours of fellow students and teachers. Distance needs to be welcomed as a new tool in feminist pedagogy.

Transactional distance is ultimately not the miles covered by letters in the mail, the strength and speed of in internet network connection, or the time taken to respond to an asynchronous email message, it is a reflection of how engaged the student is with learning. Transactional distance can exist in a classroom where for example the student sit within feet of each other come from cultural backgrounds and bring sets of experiences so different from the teacher, and from each other that communication often breaks down. We have argued that gendered power differences produce greater transactional distance for female than male students, particularly in male dominated disciplines such as STEM. The solution to the problems of transactional distance is not always to create the opportunity for more interaction between people, if that interaction brings unequal power with it. The stress on the importance of group learning in some distance learning models can imply that students have an obligation for the learning of fellow student greater perhaps than they have for themselves and their own comfort, and it can ignore the gendered or other power

dynamics, even within an online learning environment. Many of our women students have enjoyed and benefited from NOT being in the virtual classroom with male students on the same course, but equally in some cases enjoyed NOT being with other female students. This is the hard message that both theories of feminist pedagogy and theories of transactional distance have to come to grips with as we move into a new age of widespread and ubiquitous technology enhanced learning.

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ⁱ See more about Anna Ticknor at the website of the Ticknor Society : <http://www.ticknor.org/Anna.shtml> (accessed 16.06.2105)

ⁱⁱ Garrison (1985) was the first person to differentiate ‘generations’ in distance education systems, the first being that of correspondence only education. The second generation, , is characterised by the use of mass broadcast media. The third generation is incorporates online, interactive/ie two way and more, communication systems.

ⁱⁱⁱ See national survey analysis from 2005 onwards : <http://www.hefce.ac.uk/lt/nss/results/>

^{iv} The Sex Discrimination Act allows training organisations to take positive action measures to advertise women-only or men-only training courses for work where it can be shown that few or no people of that sex have done that kind of work in the previous year - <http://www.equalityhumanrights.com/>