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[See table of contents](#)

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Globalizing Flexible Work in Universities: Socio-Technical Dilemmas in Internationalizing Education

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Introduction

We engage with and respond to the debate raised by this theme issue of the *International Review of Research in Open and Distance Learning* with a particular question in mind: namely, as universities are using new labor displacing technologies to export degrees to meet the international demand for higher education, how is this influencing – negatively and positively – the workers involved? Contemporary transitions in political and economic globalization are being used to press universities into becoming ‘transnational businesses,’ seemingly driven by a primary concern for marketing educational commodities. The neo-liberal politics driving these currents in universities are increasing the multiple online and offline networks. These local/global meshworks engage the labors of a small but growing percentage of the world’s population (Singh, 2002, pp. 217-230). Writing this paper at Jilin University in China, we find that many of our academic colleagues and students have limited access to a personal desktop computer, the Internet, and email. They must pay for timed access to their email accounts and for downloading attachments. They do not have access to high-speed data networks. A timer indicates how long it will take to open and send emails. Around us, construction workers are building massive facilities to house the burgeoning on-campus student population. Their offline education is being supplemented – but not replaced by ever-advancing online technologies.

Neo-liberal governments are ideologically committed to reducing investment in the tertiary education of a democratically inspired citizenry. This has stimulated people’s desire to engage in learning and re-learning throughout their lives in their quest for socio-economic security. These state-sponsored changes lead Cummings, Phillips, Lowe, and Tilbrook (this issue) to cite the assertion by the Federal Minister for Education, Science, and Training that “Australian universities [have] nowhere to hide from the winds of change.” Smith (this issue) suggests that funding-cuts by these governments have pressed universities to seek private sources of income. This explains the drive to recruit full-fee paying students from countries in the Majority World.

Downsizing their labor force through technology replacement strategies is also part of these reforms. The rationing of education to inform and to give form to ‘the public’ has led to cost-cutting reductions in offline, class-based teaching/ learning. Universities are struggling with their economic and cultural sustainability, while at the same time they are trying to meet the demand for low-cost higher education by producing graduates for the world’s multilingual knowledge economies. Updating higher education has been a significant topic of public policy debate for over two decades (Cummings, Phillips, Lowe, and Tilbrook, this issue). As public universities have come to be disparagingly characterized as costly, labor intensive and lacking in productivity gains,

. . . commercial teaching machines, computers and instruction programmes are [being] introduced on a growing scale, effectively creating a situation in which [the state subsidises and] individuals pay industry for the means (terminals, teletext, receivers, access to memory storage and specific programmes) (Smart, 1992, p. 86).

Key issues concern the millions in public taxpayer being used to fund the commercialization of the information technology industry. Such anxiety is compounded by the technological displacement of workers. In this paper, we foreground related dilemmas shaping the internationalization of education by teaching students at a distance.

The International Market in Higher Education

Higher education institutions are updating their work of teaching/ learning through the use of new technologies. So too is the administrative labor which supports it. Universities are being driven by neo-liberal policies which are promoting their economic destructuring and recurrent organizational restructuring. Their attention is now on securing a share of the competitive global education markets being created by the General Agreement on Trade in Services. In this environment, ‘quality’ university teaching is defined by the ‘employment’ of online technologies in the work of delivering international education (Smith, this issue). Universities face a dynamic and challenging operating environment created by the diminution of government investment in the public sector. Many have now positioned themselves largely within the English-only segment of the world’s multilingual knowledge economies. Others have initiated a range of online teaching/ learning innovations. Some are conducting research into creating new markets using labor saving technologies. Internet delivery systems are claimed to provide flexible teaching/ learning opportunities for students from diverse ethnic, social, and cultural backgrounds – or at least online education is there for those who can afford to pay and who can study in English.

The pressure of government disinvestment in the education of a democratically informed and formed public has pushed – or invited – universities to integrate new technologies into educational work. In seeking to reform their relationship with students, universities are struggling to make financial – if not pedagogical – advantages of the Internet. The key is to have fee-paying, off-campus, online customers perform the many student administration tasks for which staff were once employed (Cummings, Phillips, Lowe, and Tilbrook, this issue). This positioning of universities as successful local, national, and international businesses in state driven and regulated local/ global markets provides another focus for public debates. Not everyone willingly accepts

the subordination of university education to the political and economic demands of neo-liberal globalism:

Intellectual producers [are] more directly subordinated to the demand of economic and political powers to the emergence of a mass market for intellectual ideas increasingly controlled by the new media industries (Lane, 2000, p. 186).

The struggle for a competitive advantage may or may not contradict the effort to maintain the value and integrity of decent education. For over a decade, certain governments have been engineering transnational markets in higher education. This competition is being orchestrated as a principal determinant of the success or failure of their public universities (Nunan, this issue). Many are now experiencing crises. Some have been caused by the high financial and human costs of going online. One factor in the survival or redundancy of universities is the growing international education market. The marketing function of universities seems to be best met by representing themselves through future-oriented images and imaginings of online technologies. This is so even though the education of students from Quanzhou Normal University in Fujian Province, China, for example, may be better served by other modes of education.

Full-fee paying students from China studying abroad regard offline education as a significant advantage to their future work-life trajectory. Benefits include the enhancement of their English language proficiency, transnational networks, and cosmopolitan identity (Singh, 2005). Few prospective international students, such as academics from Dalian Maritime University in Liaoning Province, China, however, can afford such in-country studies. Even those who 'might' be able to pay fees plus living costs do not have the opportunity because of other constraints. Yet online delivery is mistakenly imagined to be a cheap, labor saving intervention, especially where there is no accountability for the costs of displaced labor. It is seen as an economic way of meeting government funding shortfalls. It promises to fulfill newly established policy commitments to provide for fee-paying students, having due regard for location and discipline. The potential of the Internet to contribute to online education globally is imagined by some to increase as the cost of access to information and communication technologies promises to fall (Smith, this issue). However, the rise in the traded value of some overseas currencies during the years 2003-2005 has resulted in students from China having to pay an additional 25 percent in Yuan to study abroad. Claims about the death of distance arise from imagined cost reductions in communications. This is an important source of rhetorical appeal for policy-makers concerned to effect cost cutting through labor reduction in the multi-modal university (Smith, this issue).

Multi-modal Universities and Their Strategies

Universities are struggling against the regulatory force of the state to be “fast, fluid, and flexible” (as Smith this issue cites Dolence and Norris, 1995) in their uses of labor and technology in the global lifelong learning market. Online delivery is imagined as offering ways of addressing this problem (Smith, this issue). New technologies may contain fees and generate surplus income through transferring administrative work onto the students-as-customers. This continues to occur in other service industries such as supermarkets and banks. It is occurring through the intensification of academics' work, despite enterprise bargains claiming reductions in their

working hours. The displacement of librarians via electronic data search, retrieval, scanning, and transmission services may make some aspects of studying online attractive, especially as a supplement to offline education (Nunan, this issue). However, the hierarchically structured, status-oriented international education market creates challenging opportunities. Universities from some countries are unequally positioned in the competition with others for the online delivery of education.

By using technological tools, universities are imagining ways to provide access to online educational resources for onshore and offshore students (Cummings, Phillips, Lowe, and Tilbrook, this issue). Some universities wish to balance the ‘poaching’ and ‘loyalty factors’ inherent in marketing strategies. They try to keep their currently enrolled students and at the same time maximize the ‘capture’ of students from other institutions.

The new technologies of online education have created opportunities for the flexible delivery of courses for offshore students. Flexible delivery assumes possibilities for a rapid response to the changing market conditions and the recruitment of students beyond national geographical boundaries (Nunan, this issue). Those offering online education are working to produce and expand multi-modal delivery courses in an attempt to protect market interests.

However, clever universities are articulating online and offline delivery (Nunan, this issue). Online modes are used to supplement labor intensive, face-to-face processes. Students seem satisfied that their educational experiences are not being devalued by any limitations of distance. Similarly, clever university managers have encouraged and supported academics to research the combined potential of online/ offline teaching and learning (Cummings, Phillips, Lowe, and Tilbrook, this issue). Offering education via flexible delivery involves a dual mode of provision for on-campus and off-campus students. These teaching/ learning experiences involve on-campus/ offline, text-based distance education, and online studies via the Internet (Smith, this issue).

A number of universities teach offshore students through a range of partnerships with overseas organizations. They use local tutors and have their academics conduct site visits for intensive, offline, face-to-face teaching (Reid, this issue). A key purpose of universities being multi-modal providers is to bring together both national and international students with diverse ethnic, linguistic, social, and cultural knowledge and skills. Planning helps with consistency in communication between academics and both onshore and offshore students (Reid, this issue).

For some universities, however, the distance between the dream and the reality of online education has been a nightmare. This has been particularly so in places where academic management systems have been introduced to reduce the number of administration staff. There have been false appraisals by senior university managers arising from their superficial understandings of online education and the fiercely competitive transnational market forces. They have made faulty financial calculations of online academic management systems. Frankel (2004) observes that “technologically illiterate . . . education managers continue to be sucked into multi-million dollar information technology outlays that bring little improvement in teaching and learning . . . at the expense of expenditure on under-resourced teaching staff, library books, and

buildings” (p. 219). Some senior university managers seem to have serious limitations with respect to the complex dilemmas of reforming work around technology rather than human labor. Castells (2001) captures this concern for power without knowledge: “[The] Internet is indeed a technology of freedom – but it can free the powerful to oppress the uninformed, it may lead to the exclusion of the devalued by the conquerors of value” (p. 275).

Technological Systems in Online Teaching/ Learning

Online modes of educational delivery accommodate significant sociological changes. In particular, they provide important infrastructure for new ways of working higher education, especially in terms of intensifying the productivity and surveillance of academics. New technologies enable the creation of qualitatively different infrastructures for organizing academic work to accommodate online teaching/ learning practices. University infrastructure is now understood as the configuration of human labor and the balance of technological substitutes. Smith (this issue) reports that this infrastructure has been redesigned to support university ‘business’ expansion into new international markets, administering online teaching/ learning, and managing quality. As a supplement to offline education, online education has experienced a series of metamorphoses in work practices. It has moved from the correspondence, to multimedia and tele-visual teaching/ learning, through flexible teaching/ learning, to the current Internet and Web-based approaches (Smith, this issue).

Universities use different systems to support online learning as part of the public sector’s contribution to underwriting the commercial viability of the information and communication technology industry. In the process, they contribute to the displacement of human labor. Some universities have introduced ‘enterprise systems’ (McConachie and Danaher, this issue) to direct online teaching/ learning. These provide access to coordinated services and resources through integrated technological systems that are fundamental to a university’s administrative, teaching/ learning, and student support functions. These enterprise systems may contribute to cost effectiveness by potentially increasing access to education on a global scale. It may be their labor saving costs that make them especially attractive, however. Others ways of achieving cost effectiveness are to produce ‘thin pedagogies’ and increase pressure on staff for 24/ 7/ 365 response times (Smith, this issue). And this is despite academics having bargained for an officially designated shorter working week. Lessard and Baldwin (2000) provide insights into the permanently temporary Web workers whose job-to-job existence is to hold the online economy together.

Individual universities may decide on a single system so that students can access all they need from one platform having consistent formats and user functions. In that context, the provision of the Generic Online Offline Delivery (GOOD) system at the University of Southern Queensland promises the efficient dissemination of courseware and the integration of e-applications (Smith, this issue). For instance, *Blackboard* and *WebCT Vista* can blend online and offline face-to-face course delivery, supplementing teaching and class organization strategies. At Jilin University, a whiteboard using computerized radio links is being used in electronic-based distance teaching. Besides being able to be used with a data projector, this system has a number of advantages. First,

when it is used in teaching or conferencing, the notes on the whiteboard are recorded in the computer in their entirety and displayed on computer screens. Students can read, edit, print, or download the whiteboard notes through any personal computer. This can release both face-to-face and online students from being busy taking lecture notes in class. In turn this makes possible their increased participation in class discussions. Second, the use of this Internet-based system overcomes time and space limitations. Students can participate in a conference or lecture discussion simultaneously from all over the country, if not further abroad.

Likewise E-Uni Assist holds the promise of managing interactions between the university and its students. It claims to serve existing and prospective students at minimal variable cost effectively and efficiently. The Jilin University Distance Education System uses E-Uni Assist and E-Uni Teaching for enrollment, teaching, and assignment marking. Enrollment is done through the E-Uni Assist system so that both on-campus/ off-campus and distance students do not have to come to the university. By using the E-Uni Teaching system, the teachers engage in interactions with the students in their class during lectures. Also the teachers and their students use interactive telecommunications to solve problems in class.

Similarly, the course management system at Central Queensland University claims to support teaching/ learning by providing tools for communication, student assessment, the presentation of study material, and the organization of student activities for institutional identity (McConachie, Danaher, Luck, and Jones, this issue). It promises to do all of this in the uncertain environment of global/ local education, politics, and economics. Much technologically driven reform of academic work focuses on personal computers. At Changchun's Qin Bowl Restaurant we observed the possibilities for using an even cheaper technology to substitute for paid workers. This restaurant, which specializes in menus from the Qin era (2000 years ago), has waiters using mobile telephone and Mandarin characters to SMS customers' orders for meals to the kitchen. This suggests that the pedagogical possibilities of this relatively inexpensive computer technology have as yet to be realized.

A related problem facing universities is that some information systems are developed through a planning process with purpose driven methodologies. McConachie, Danaher, Luck, and Jones (this issue) observe that there is no consensus about, and much contestation over, whether teaching/ learning should be monitored and controlled by central administration. Business development units, faculties, schools, and the lecturers who do the work of developing, designing, delivering, and assessing marketable courses also struggle for control.

Quality Assurance Regimes

Is the nation state retreating from, or intervening in, local/ global education markets? Ostensibly, one function of a quality audit is to assure the quality of the national brand for university education. Concerns about the perceived value of undergraduate and postgraduate degrees in the emerging local/ global higher education economy have been generated by failed endeavors. These 'crises' may not be unrelated to government decisions to disinvest in the education of their own citizens. This is part of the neo-liberal state's retreat from underwriting their socio-economic

security. Governments have used these ‘crises’ in the market to create quality assurance agencies (Strathern, 2000). This has increased governments’ regulation of, and extended their intervention in, universities to the level of determining course offerings. Those public universities that have increased their dependence on funds – other than from government – by growing as commercial entities have also experienced greater, not less, state regulation. Reid (this issue) observes that the quality assurance regime has grown to provide state legitimation where its citizens or customers question whether governments are providing quality public universities.

Questions about the quality of offshore operations have provided a stimulus for efforts by governments to protect their collective higher education ‘national brand.’ Managing quality processes has become critically important work for higher education institutions as they become involved in flexible or online international education (Inglis, this issue). Quality assurance workers are important in the educational politics affecting the governance of flexible, online teaching/ learning (Reid, this issue). Ostensibly the desire is to keep offshore teaching at the same quality as that delivered by other means.

Offshore students do need to receive the same material, and hence receive quality teaching“ . . . in order to protect their critical market . . . in overseas education, universities have wanted to ensure that the standard of the educational products that they have been offering matches the standard of what they are offering onshore” (Inglis, this issue). Quality is assured in offshore delivery through various ways. These include effective crosscultural communication, having dedicated and committed staff, ensuring sameness with other forms of delivery, and developing explicit frameworks for conceptualizing and structuring educational, administrative, and commercialization processes (Reid, this issue). Ironically, the decline in government funds for offline, on-campus education may provide another means for lowering and thereby equalizing quality standards internationally. Some countries have established agencies to manage, conduct, and negotiate the quality audits of their universities (Inglis, this issue).

The concern with quality assurance regimes in higher education has led universities to invest heavily in managers of quality processes. Sometimes this work is put ahead of delivering quality teaching/ learning (Inglis, this issue). In Australia, the Quality Framework and Benchmarking Framework offer potentially complementary, and perhaps sometimes conflicting, ways of conceiving and managing the application of quality surveillance regimes. These Frameworks may be used by managers to regulate university processes relating to flexible, online learning (Inglis, this issue). Not surprisingly, these two regulatory tools were the products of government-funded projects. The Quality Improvement Framework was devised to enable corporate managerialists within universities to legitimize, rationalize, and institutionalize the regulatory ideology and politics governing the use of new teaching/ learning technologies. This Framework centers on regulating those aspects of university work that are concerned with teaching, program delivery, and student support (Inglis, this issue).

The Benchmarking Framework is intended to regulate university work by making comparisons with other universities across a selected range of corporate managerialist functions. As a regulatory device, its purpose is to enable universities to compare themselves with their

competitors in the government-sponsored markets for students, funding, and staff (Inglis, this issue). Both Frameworks perform similar regulatory, ideological, and political functions for governments. Each of the Frameworks serves to guide, invite, or even coerce certain ways of doing flexible teaching/ learning, administration, and commercialization. The Benchmarking Framework supports a more general regulatory regime. The Quality Improvement Framework allows this regulatory force to be effected at the operational level of academics' daily work. When it comes to making operational decisions regulating the work of academics and their organizational units, the Quality Improvement Framework is likely to be especially powerful (Inglis, this issue).

The quest to establish an individual and national university brand in this 'dot-com era' seems to involve robbing academics of the power that they once imagined themselves having to control their own educational work. This may be due to the increasing power of government surveillance mechanisms represented via quality assurance regimes. On- and offline technologies of power are proving to be effective mechanisms in this regard (Reid, this issue). This leads to quality assurance and marketing regimes being more business driven than having any educational rationale (Nunan, this issue). Considering the emerging online environment, it is difficult to make claims concerning its educational quality because this means of teaching/ learning is rapidly changing. Quality is associated with experience developed over a long period of time.

Number 7 Middle School in Quanzhou, Fujian Province, China offers insights into new permutations in quality assurance. Here new technology is linked to the desire to control the work of educators. A closed circuit television system is being used to monitor students and teacher performance in classrooms. This system is mainly used in beginning teachers' class so as to assist them in solving pedagogical problems. Parents interested in observing their child's classroom behavior and performance have access to this system. This system, however, has not been installed in the classrooms of foreign teachers because the school is confident of their teaching ability. Moreover, these teachers have refused to be monitored in class.

Updating e-University Administration

It is wrong to claim that the major problem with updating e-university administration is merely a technical matter. Online academic management systems do have technical problems; they have also had disastrous managerial problems. In at least one instance, the disaster created by 'leader-led change' – or the top-down approach as described by Cummings, Phillips, Tilbrook, and Lowe (this issue) – in this area was equivalent to the mayhem, chaos, and injury of a train crash (Singh and Li, 2004). 'Leader-led change' refers to a single person asserting self-interest in power and laying claim to being able to determine a path supposedly preordained to guarantee happiness for all. The cause of these socio-technical problems arose from the misadventures of senior university managers. The culpability of curriculum developers, educational designers, information technology and online specialists, evaluators, academics, and administrators was much less. Commitment to develop innovative socio-technical pedagogies finds expression in concrete actions by academics on the ground. In addition to these technological and pedagogical problems, the work of ensuring the continuation of innovative pedagogical projects, more often than not,

involves confronting the problems of corporatism, commodification, image management, and old style feudalism.

Another problem for online education is how evaluations are conducted. Systematic, methodologically rigorous evaluations compete with market-oriented image management to provide senior university managers with evidence informing their decisions about the trialing, roll-out, updating, or implementation of new on/ offline policies, procedures, and systems (McConachie, Danaher, Luck, and Jones, this issue). Informed and prudent university managers take responsibility for integrating good policies, documented practices, and implementation strategies in a coherent and complementary way into their strategic operational structures. This increases the transparency as to why change is necessary. It also demonstrates how senior university managers are responsibly engaging with the multimillion dollar dot-com changes that they are sponsoring. This may also increase the level of ownership by academics of a university reform through involving them in its productive reworking (McConachie, Danaher, Luck, and Jones, this issue). The nightmares experienced by administration and academic staff to date lend credence to such an approach.

Attention is required, however, by any mismatch between university management's policies and the centrally administered academic management system(s) (Reid, this issue). There is conflict between an educationally driven, problem posing approach and a more centralized, less-than-flexible, corporate managerialist approach to academic systems development and planning (McConachie, Danaher, Luck, and Jones, this issue). The use of flexible education technologies is a key plank in the corporate managerialist strategy, sometimes developing through failure and injury (Reid, this issue). Decentralized professional, administrative, and academic integrity cannot always compensate for the failure of the command and control system of centrally administered online delivery.

Leadership density is a critical element in updating management in universities. A broad leadership base and an engaged management are complementary elements. Cummings, Phillips, Lowe, and Tilbrook (this issue) note that both leadership density and managerial integrity are necessary to produce tactful, sustainable, and thoughtful change. But such a dialogic approach stands against conflicting claims for either top-down or bottom-up approaches. For instance, top-down approaches such as 'leader led change' seek to achieve reforms through the imposition of central policies. Power-coercive strategies prevail despite the milk and honey language used to make such policies palatable. This change is effected through force, intimidation, and victimization as much as through seductions using rhetorical, legal, financial, and industrial means.

By contrast, an interactive approach brings the main policy actors in the change process together. University management, administrators, and academics engage in a dialogic relationship, rather than one based on surveillance by the former of the latter. This problem-oriented, question-provoking approach emphasizes collaboration, negotiation, and distribution of authority. This approach involves capitalizing on the best of the organic changes arising from the work of innovative academics, using this both to inform policy advocacy and as exemplars of policy-in-

action. Here educational change is understood as collaborative cultural work. The personal motivations of early adopters are harnessed to deepen and extend leading edge pedagogies, policies, and politics already present within universities. Experiences of alienation, disaffection, and exhaustion in universities create environments in which leadership density and dialogic approaches to innovation may now seem legitimate options:

The creation and development of the Internet . . . highlights people's capacity to transcend institutional goals, overcome bureaucratic barriers, and subvert established values in the process of ushering in a new world . . . [C]ooperation and freedom of information may be more conducive to innovation than competition and proprietary right (Castells, 2001, p. 9).

Universities prepared to nurture the professional integrity of academic and administrative staff might change small elements (units or courses) without disrupting the larger environment. Cummings, Phillips, Lowe, and Tilbrook's 'low risk, low cost' model of change (this issue) might be appropriate in an environment of government disinvestment in the educational formation and informing of a democratically inspired public.

The destructuring of many universities and of academic work under the contemporary agenda of neo-liberal globalism aims to increase productivity as much as it seeks to manage or otherwise to direct or even to control the cultural processes of educational work. In China, as elsewhere, new technology is being used in the administration of universities and schools. For example, Number 7 Middle School in Quanzhou has operated its daily administration through the Internet and a closed circuit television program. Each class has an online computer with its own webpage. The school's daily arrangements and notices are accessed through the Internet, and school news is received through an internally broadcasted television program.

Conclusion

This is a time of renewal for higher education internationally. Their destructuring and restructuring expresses and reflect changing patterns of global/ national/ local integration, stratification, and exclusion. The supplementation of static industrial labor with work involving the handling of information means that knowledge workers can be recruited – and disposed of – on a global scale. Academics experience the frustration of exploring educationally sound pedagogies using new technologies in the face of state sponsored marketing and regulatory forces that 'de-skill' them. Corporate managerialist pressures constrain possibilities for enabling the dialogic production of knowledge. Nevertheless, there are constant challenges to the boundaries imposed by their exclusionary and homogenizing pedagogical projects.

It is important to position students on the knowledge production side of using new technologies. This is underwritten by high levels of education within one's immediate funds of community knowledge and the income to enjoy the benefits of access. New technologies are being used to open up spaces for unbounded, multi-directional flows of communication, networking, and bonding. This may rework the limits of managerial and academic imaginations. The Internet expands the spaces used by educational communities to communicate and engage in knowledge

production. This challenges restrictions imposed by the centralized command and control systems of corporate managerialists who favor, if not impose, knowledge reproducing pedagogies. There are educational movements which network globally to investigate innovations in computer use to mediate collaborative knowledge production.

There is a need to be vigilant in detecting technological determinism. Serious questions have to be asked of claims that new technologies are the cause of changes in higher education. The logics and limitations of these technologies are still poorly understood. We do know that they provide no guarantees for sustaining educational communities, nor do they necessarily lead to the alienation and disaffection of educators and students.

Typically, educational communities have relied on networks to expand their immediate locale to the transnational, if not the global, scene. Through debates, they negotiate the construction of shared discourses about research processes and their theoretical framing, as well as the substantive issues under investigation. Online educational work offers opportunities to investigate a shared agenda around educational change and globalization, students' sense of identity as knowledge producers, and their imaginings of a transnational learning community with all of its richness and complexity. These online pedagogies, however, are often initiated and sustained through real world, offline conditions. Opportunities for face-to-face meetings reinforce the desire and capacity of educators and students for online connectivity. Both the off- and online elements seem to be integral to sustaining this educational community through time and space. Pedagogically the productive educational gains come from the integration of the work of off and online education. Online connections function to extend and, in turn, benefit from face-to-face, offline teaching/ learning engagements. This makes the work of online education even more effective.

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