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EDITORIAL / ÉDITORIAL

Volume 47-1 of the *McGill Journal of Education* comes out at the height of the largest student movement in Canadian history. The Quebec student strike, which at its peak numbered over 300 000 and which at the time of publishing has lasted over four months, has vehemently opposed the Quebec government's plan to increase tuition by 75% over five years, an increase that would raise the student bill by $1625 (since modified to 82% over seven years). Over the four months, the province of Quebec has seen hundreds of demonstrations – including over 50 consecutive night demonstrations and two days of action, which, on each occasion, drew in the environs of 250 000 (or more) into the streets of Montreal. There have been upwards of 3000 arrests amidst an at times violent state response to protesting students, their families, and their supporters, and very recently the symphony (or cacophony, depending on your perspective) of *les casseroles*, spontaneous evening gatherings from the very young to the very old banging pots and pans on street corners throughout Montreal and across Quebec. The cost of this movement has soared well into the millions, an amount that far surpasses the gains in revenue the government stands to achieve through the first five years of the tuition increases. Tens of thousands of Quebec university and college students will likely lose their 2012 winter semester, while the Quebec government has pushed through a *loi spéciale*, officially known as Bill 78, that imposes severe restrictions on protests and people's ability to assemble. At its most draconian, it levies harsh financial penalties on student groups and individuals for contravening the narrowly-defined law. The law has already been condemned by a broad section of Quebec and Canadian society, as well as raised the concerns of United Nations human rights officials and international organizations, such as Amnesty International.

The issue at the heart of this movement has, for the most part, been framed by the students as one of accessibility: if the proposed tuition increase goes through, and if this raise is allowed to set a precedent for future tuition increases, how can families send their children to university; more importantly, *which* families can? Moreover, it's not just about students anymore. The Quebec student movement is resonating, tapping into a broader dissatisfaction in society. The

introduction of the new special law has seemed to galvanize a broader dissent, spurring forward social critiques that far exceed the boundaries of struggle over the costs of tuition or access to education. Alongside Canadian cities, recent solidarity marches have been staged as far as New York, Paris, Taipei, and Brussels. Ontario student associations have pledged to bring the fight to their province. Much like what was explored in a 2009 MJE special issue on social movement learning (vol. 44, no. 3), the student movement appears to be serving as a makeshift alternative classroom, rich with opportunities for learning about structures that organize, as well as rigidly constrain, the ways we all live together. Both informally, as participants meet and talk on protest marches, and non-formally, in the workshops, seminars and general assemblies that have been held over the course of the strike, discussions around user-fees for education have generated a broader oppositional discourse. This discourse is directed against not only the growing shift towards privatization and commercialization already underway in universities across Canada but the broader neoliberal dismantling of social security, its accompanying politics of economics of austerity, and its plying on fears around increasing debt. Calls for a *grève étudiant illimitée*, or ongoing student strike, have increasingly become (if hopeful) calls for a *grève générale* (which has generated some anxiety about whether a resolution to the tuition question would alleviate the crisis).

While the student movement has ballooned outward in scope and support, it has also challenged those who work within academia to look inward at our practices and pursuits. Academic publishing, as the life-blood of scholarly activity, is one of the main terrains where battles around cultural and structural changes to the university are waged. Perhaps no university community is more vulnerable to these changes than graduate students who, as emerging scholars, straddle the divide between student life and the world of professional academia. In this way, graduate student writing for publication, as the work of a student but also the contribution of a scholar, provides a useful place to start when examining both how tuition increases are embedded within a larger restructuring of the academy and their implications for academic publishing.

The *McGill Journal of Education* has served graduate students well, as both a source of scholarship and in recent years, as a venue for their work. Over half of the contributors to the current issue are PhD students or candidates; this is not untypical. The *MJE* is committed to graduate student publishing. As new scholars, student contributions can be a rich source of knowledge, shaking up sedimented practices and stirring disciplinary pots. As the graduate student bill grows, becoming increasingly onerous; as student debt mounts; as our governments continue to divest in education, emerging scholars will become more and more beholden to external sources to cover their costs. Their ability, as new scholars, to innovate may also be compromised as funding sources becoming increasingly fewer, narrower and more competitive, steering scholarly output in pre-set directions determined largely by the funder. These strictures

are but symptomatic of a larger malaise brought on by academic restructuring. At the 2012 World Economic Forum in Davos Switzerland, Canadian Prime Minister Stephen Harper admonished businesses to make more use of the universities, pressuring universities to become a staging ground to advance the interests of the business community. The result will surely be the increasing commercialization of research. The Quebec student movement has drawn attention to the relationships between what a university does and how it is funded. Unless we, as students, scholars, and concerned citizens, all stand up, the ideals of the liberal university will surely be eroded.

What is at stake, then, is access: access to universities (i.e., through low tuition), access to publishing through the engaged scholarship of emerging scholars, and public access to scholarship. In 2007, under the editorship of Anthony Paré, the MJE made the political choice to join a dedicated group of journals in becoming online and open access. The fight for open access is an acknowledgement that the outcomes of university research should be open and accessible to all communities, not only those individuals and interests that can afford to pay to publish, or to pay for published works. Open access scholarship, like academic freedom and the movement against tuition increases, is about protecting the integrity of research and scholarship for the public, broadly conceived.

As Volume 47, issue 1 of the *McGill Journal of Education* attests, the *MJE* remains committed to access to the university, while also promoting innovative research and writing on education and learning from graduate students, academics and practitioners. In this issue, Lewkowich, Riveros and Viczko as well as Zhou bring new or different conceptual lenses to prevailing issues or practices in education (viz., technology in the classroom, teacher professional development, especially the pervasive PLC, professional learning community, and science education). Loughland draws our attention to the traces of an old yet vital practice, the demonstration school, in new policy initiatives in Australia. Segedin listens to the student voices of at-risk students who have experienced streaming in schools, while Maynes, Allison, and Julien-Schultz listened to their teacher candidates' accounts of "life-changing experiences" while on international practica in Kenya.

The MJE issue opens with a piece by David Lewkowich in which he states that technology (broadly understood) is not neutral. Nor is it simply a tool. Technological objects carry "shadows" of past situations; in particular, they carry "curricular shadows." In "Technology and Curriculum: Shadows and Machines," Lewkowich argues that the presence of technology in classrooms is fraught with ambiguity. The newest technologies are undoubtedly here to stay but need to be seen alongside a continuum of "technological objects" inhabiting the classroom, any one of which ought to be reframed in relation to "the problem of whether the actual structures of the pedagogical relation-

ship are themselves thrown into question" by their use. Students also bring their own dynamic, energies and motivations, which "insinuate traces" on classroom objects and spaces. While the tool can "motivate[s] certain decisions that might otherwise have remained unthought," young people may also understand that "there is more than one way to skin the cat called school." Lewkowich suggests that teachers and educational scholars both need to be more alert to the important possibilities that attention to curricular shadows might provoke in the classroom.

In their "Professional Knowledge 'From the Field': Enacting Professional Learning in the Contexts of Practice," Augusto Riveros and Melody Viczko examine the disjuncture between the "scenarios" created for professional practice in schools and those created for professional development. Using Actor-Network theory, they interrogate the PLC, or "professional learning community," which has become the default structure in teacher professional development. Actor-Network theory, the authors suggest, can provide a frame through which to tailor professional development to specific contexts of practice. The theory would allow professional development initiatives to better take into account the "heterogeneous assemblage" of actors and networks inhabiting schools, including issues of struggle, where the reform itself comprises a part of the assemblage and its negotiation of interests. Riveros and Viczko then apply this framework to analysis of a case study of reform in an Alberta school. They conclude by suggesting that knowledge is generated as teachers, students and objects interact, and that further research should pay closer attention to these interactions and their traces in classrooms.

In "Teacher Professional Learning in Pursuit of the Common Good: A Discussion of the Role of demonstration schools in Teacher Education," Tony Loughland traces the origins of recent Australian policy initiatives to the demonstration school. Writing primarily out of the Australian context, but encompassing the United Kingdom and the United States, Loughland proposes that policy changes like Australia's new Centres for Excellence in Teacher Education echo the demonstration school model but without a full understanding of what that model means: "This 'ahistoricism' is accompanied by the penchant of contemporary neo-liberal governments to focus more on the setting of performative measures rather than taking responsibility for the proper execution of process, including the recognition of historical models." Loughland traces the historical role of the demonstration school across continents. He then examines one Sydney school, using the case study to "counterpoint" the government's top-down policy initiative. Genuine professional learning initiatives, Loughland reminds us, require long-term support without short-term targets, which can threaten to undermine the kind of learning culture and support of teachers as professionals embodied in the demonstration school.

In "International Practica Experiences as Events of Influence in a Teacher Candidates' Development," Nancy Maynes, John Allison, and Lynn Julien-Schultz take up questions around the impacts on Canadian pre-service teachers of international practica that the teachers described as "life-changing." As supervisors in the field, the researchers accompanied seventeen male and female teacher candidates between 22 and 28 years of age in an international practicum. The teacher candidates taught for three weeks in elementary and secondary schools run by a non-governmental organization in rural Kenya. Nine months after the practicum, using electronic questionnaires with open-ended prompts, the researchers asked the teacher candidates about their experiences, to which eleven responded, all the while also reflecting on their own "life-changing" experience as supervisors. Their piece focuses on how teacher candidates perceived their personal beliefs as impacting on their personal and professional practices and how their worldviews and approaches to teaching were affected by their experience of teaching in the global South. The authors identify one direction for future research as collecting longitudinal data on the long-term effects of such experiences on teachers' classroom pedagogy, particularly as they relate to social justice issues.

Lauren Segedin, in "Listening to the student voice: Understanding the school-related factors that limit student success," elucidates the ignored voices and feelings of at-risk students about their experiences of streaming. Her work also reveals the complexities of ability grouping and its consequences on student success. Students' stories of marginalization highlight some of the enduring problems with public education. Drawing on critical pedagogical perspectives, the study raises fundamental questions about the purposes and structure of public schooling as it asks, "Whose knowledge it is that students learn and why it is organized and taught in a particular way"? Through profoundly moving narratives, Segedin deftly exposes how streaming, curriculum, and teacher expectations act as barriers to student success. The majority of the high school students in this study pointed out the lack of relevance of a curriculum largely designed for university-bound students to their current or future lives. Being at-risk and in the applied stream felt like a stigma and a deficit, entailing a lesser status and lower academic expectations in the eyes of their teachers. The most distressing outcome of these systemic flaws was that students tended to blame themselves for their failings. Segedin's work invites educators, academics, and school leaders to re-examine these issues from the perspectives of students and consider ways of making schooling a stimulating, rewarding, and meaningful experience for *all* students.

George Zhou, in "A Cultural Perspective of Conceptual Change: Re-examining the Goal of Science Education," draws attention to the significance of students' cultural experiences, notions, and values in relation to learning school science. Pulling on post-colonial theories and cultural studies of science education, he illuminates the dynamic nature of the "hybrid space" of the everyday, cultural,

and scientific cultures in which science learning takes place. Zhou argues that a clash between these cultures may inhibit students from developing a meaningful conceptual understanding in science. While pointing out the strengths and limitations of the conventional models of conceptual change, Zhou proposes an argument approach to advance students' conceptual learning as well as engage them more in a learning process involving different worldviews. Zhou believes that an argument approach would enable students to "appreciate" scientific views and motivate them to become more actively involved in constructing scientific knowledge.

Many thanks to Stephen Peters, MJE's Managing Editor and working graduate student/emerging scholar, for stepping up to be the lead author on this editorial. This MJE issue also features three book reviews written by doctoral students/emerging scholars. As of this issue, MJE's Book Reviews are being coordinated by two doctoral students. Many thanks to for all for their focused work and contributions.

A.A., A.C., S.P., & T.S.W.

REFERENCES

Harper, S. (2012, January). Special Address by Stephen Harper. In K. Schwab (Chair) *The great transformation: Shaping new models*. Address at the meeting of The World Economic Forum, Davos-Klosters, Switzerland. Video retrieved from World Economic Forum website: http://www.weforum.org/videos/special-address-stephen-harper-annual-meeting-2012

ÉDITORIAL

Le volume 47-1 de la *Revue des sciences de l'éducation de McGill* (*RSÉ*) paraît à un point culminant du plus important mouvement étudiant de l'histoire canadienne. La grève étudiante québécoise a compté 300 000 grévistes-étudiants à son apogée et dure, au moment de cette publication, depuis plus de quatre mois. Les grévistes s'opposent avec véhémence au plan gouvernemental d'augmenter de 75% les frais de scolarité universitaire sur une période de cinq ans, augmentation représentant une majoration de la facture étudiante de 1 625$ (modifiée depuis à 82% sur une période de sept ans). Au cours de ces quatre mois, la province du Québec a connu des centaines de démonstrations – incluant plus de 50 jours consécutifs de "manifs de soir" et deux rassemblements ayant attiré respectivement près ou plus de 250 000 personnes dans les rues de Montréal. Plus de 3000 arrestations ont été effectuées dans un climat parfois agressif de répression policière face aux étudiants protestataires, leur famille et leurs supporters.

Récemment, la symphonie (ou la cacophonie, selon la perspective) des casseroles est apparue dans les rues de Montréal et à travers le Québec. Ces regroupements nocturnes spontanés allient les très jeunes aux plus vieux, chacun frappant sur des plats et casseroles aux coins des rues. Le coût de ce conflit atteint désormais plusieurs millions, un montant qui dépasse largement les gains espérés par le gouvernement en augmentant les frais de scolarité au cours des premières cinq années. Des dizaines de milliers d'étudiants collégiaux et universitaires perdront probablement leur session d'hiver 2012. Quant au gouvernement québécois, celui-ci a promulgué la Loi 78, loi spéciale imposant des restrictions sévères sur les manifestations et possibilités des gens à se rassembler. Draconienne, cette loi permet d'imposer des amendes salées aux groupes étudiants et individus contrevenant à cette loi extrêmement restreignante. Déjà contestée par un large pan des sociétés québécoises et canadiennes, cette loi a également soulevé des inquiétudes chez des membres de l'ONU responsables des droits humains et au sein d'organisation internationales comme Amnistie Internationale.

La problématique au cœur du mouvement étudiant, et telle que formulée par les étudiants, est l'accessibilité. Dans l'éventualité où l'augmentation proposée est imposée et que celle-ci est la première d'une série d'augmentations futures, comment les familles réussiront-elles à envoyer leurs enfants à l'université? Encore plus important, quelles familles pourront se le permettre? En fait, il ne s'agit plus uniquement des étudiants. Le mouvement étudiant a trouvé écho

dans l'ensemble de la société et témoigne d'une insatisfaction plus répandue. L'imposition de la nouvelle loi spéciale a galvanisé un mécontentement plus général, stimulant la critique sociale dans des domaines qui excèdent considérablement les paramètres du conflit sur les frais de scolarité et l'accès à l'éducation. Comme dans certaines villes canadiennes, des marches de solidarité ont récemment eu lieu dans des villes aussi lointaines que New York, Paris, Taipei et Bruxelles. Par ailleurs, les associations étudiantes de l'Ontario ont promis de mener une bataille similaire dans leur province. À l'instar des thèmes explorés dans l'édition spéciale de la Revue de 2009 sur l'apprentissage par l'action sociale (vol. 44, no. 1) le mouvement étudiant fait office de salle de classe improvisée, une alternative fertile en opportunités d'apprentissages sur les structures qui organisent mais également restreignent la vie en société. Que les participants se rencontrent et discutent de manière informelle au cours des marches de protestation ou qu'ils le fassent durant des ateliers, séminaires et assemblées générales organisés en marge de la grève, ces discussions concernant les payeurs-utilisateurs ont généré un discours d'opposition étendu. Ce débat est dirigé non seulement contre le mouvement grandissant de privatisation et de commercialisation des universités à travers le Canada, mais aussi contre le vaste démantèlement néolibéral de la sécurité sociale, les politiques d'austérité économique que celui-ci engendre et les peurs qu'il exerce sur l'accroissement de l'endettement. Les appels à une grève étudiante illimitée ou grève étudiante continue, sont graduellement devenus des exhortations invitant à la grève générale (situation qui génère une certaine anxiété quant à la possibilité de mettre un terme à la crise par la simple résolution de la question des frais de scolarité).

Alors que la portée et le soutien au mouvement étudiant ont considérablement augmenté, celui-ci amène également les chercheurs universitaires à se questionner sur leurs pratiques et buts. La publication universitaire, moteur de l'activité académique, est un des principaux terrains autour duquel les transformations culturelles et structurelles sont orientées. Il n'existe probablement aucun groupe universitaire plus vulnérable face à ces changements que celle des étudiants des deuxième et troisième cycles, qui en tant que chercheurs émergents, sont à cheval entre la vie étudiante et la profession universitaire. En ce sens, les étudiants gradués rédigeant dans le but d'être publiés, œuvrant comme étudiant mais contribuant à titre de chercheur, constituent un point de départ tout indiqué pour examiner de quelle manière l'augmentation des frais de scolarité trouve un ancrage dans un vaste mouvement de restructuration du monde académique. Ces chercheurs-étudiants nous permettent aussi d'analyser l'implication d'une telle hausse sur les publications universitaires.

De tous temps, La *Revue des sciences de l'éducation* a pris sous son aile les étudiants aux cycles supérieurs à la fois comme source de financement et récemment, comme lieu accueillant pour leurs travaux. Ainsi, plus de la moitié des collaborateurs à la Revue sont étudiants au doctorat ou des doctorants et cette

situation n'est pas inhabituelle. En fait, la *RSÉ* demeure engagée à encourager la publication des étudiants-chercheurs. En tant que nouveaux chercheurs, les étudiants constituent une abondante source de connaissances, secouant des pratiques bien ancrées et mélangeant les diverses disciplines. Plus les études supérieures deviennent onéreuses, plus les dettes étudiantes atteignent des sommets. Si le gouvernement persiste à réduire ses investissements en éducation, les chercheurs émergents deviendront de plus en plus dépendants de sources externes de financement. Leur capacité à innover comme nouveaux chercheurs pourra être compromise par des sources de financement réduites, difficiles d'accès et compétitives, situation orientant leurs recherches vers des objectifs en grande partie formulés par les bailleurs de fonds. Ces restrictions sont seulement symptomatiques d'un malaise plus profond engendré par la restructuration académique. En 2012, durant le Forum économique mondial de Davos en Suisse, le premier ministre canadien Stephen Harper a enjoint les entreprises à utiliser davantage les universités, à faire appel à celles-ci comme tremplin pour l'avancement des intérêts de la communauté d'affaires. Le résultat de cette intervention sera fort probablement une commercialisation grandissante de la recherche. Le conflit étudiant québécois a sensibilisé les gens aux relations prévalant entre ce que les universités font et la manière dont elles sont financées. Si les étudiants, les chercheurs et les citoyens concernés ne prennent pas position fermement, le futur et les idéaux de l'université libérale seront certainement compromis.

Comme enjeu donc, l'accès : accès aux universités (par des frais de scolarité peu élevés), accès à la publication grâce à des bourses octroyées à des chercheurs émergents et accès de tous les citoyens aux bourses. En 2007, sous la gouverne d'Anthony Paré, la *RSÉ* a pris la décision politique de se joindre à un groupe de publications universitaires ayant choisi d'offrir leur produit en ligne et à tous. La lutte pour le libre accès constitue une preuve que les résultats des recherches universitaires doivent être disponibles à toutes les communautés, libres d'accès. Ces recherches ne doivent pas être accessibles uniquement à ceux pouvant les financer ou ceux pouvant payer pour les travaux publiés. Le savoir démocratiquement accessible tout comme la liberté académique et le mouvement contre la hausse des frais de scolarité sont des moyens de protéger l'intégrité de la recherche et le savoir pour le public, dans sa définition la plus large.

Comme en témoigne le présent volume, les artisans de la *Revue des sciences de l'éducation* demeurent des défenseurs de l'accès à l'université. Ils font aussi la promotion d'une recherche innovatrice et de publications sur l'éducation et l'apprentissage émanant des étudiants gradués, des chercheurs et des professionnels du milieu. Dans cette édition, Lewkowich, Riveros et Viczko ainsi que Zhou proposent des points de vue conceptuels nouveaux ou différents sur les problématiques et pratiques prévalant dans le domaine de l'éducation (soit l'utilisation de la technologie en classe, le développement professionnel des en-

seignants, l'omniprésente CPA (communauté professionnelles d'apprentissage) et les sciences de l'éducation). Loughland nous invite à en apprendre davantage sur une pratique ancienne mais nécessaire, l'école de stages, implantée dans le cadre d'une nouvelle politique en Australie. Segedin tend l'oreille aux élèves à risque ayant vécu l'expérience de la répartition par niveaux. Quant à Maynes, Allison et Julien-Schultz, ceux-ci s'intéressent aux récits que font des enseignants en formation de leur stage international au Kenya, une expérience ayant « changé leur vie ».

Cette édition de la *RSÉ* débute par un article de David Lewkowich qui soutient que la technologie, considérée dans un sens large, n'est ni neutre, ni simplement un outil. En fait, les objets technologiques portent en eux les « ombres » du passé et particulièrement, les « ombres des anciens programmes ». L'article de Lewkowich, intitulé « La technologie et les programmes : ombres et machines », avance comme thèse que la présence de la technologie dans les classes est chargée d'ambiguïté. Les technologies nouvelles sont, sans aucun doute, là pour rester. Cependant, il est nécessaire de les voir comme faisant partie d'un continuum « d'objets technologiques » occupant la classe, chacun d'eux devant être repositionné en relation à la « problématique cherchant à comprendre si les structures actuelles de la relation pédagogique sont elles-mêmes remises en question » par leur utilisation. Les élèves apportent aussi leurs propres dynamiques, énergies et motivations, lesquelles laissent des traces sur les objets et espaces de la classe. Alors que l'outil peut « encourager certaines décisions qui autrement auraient été impensables », les jeunes doivent également comprendre qu'« il y a plus d'une manière d'arriver à ses fins à l'école ». Lewkowich proposent que les enseignants et les chercheurs du milieu de l'éducation soient plus alertes quant aux possibilités qu'une attention plus grande aux ombres du programme d'enseignement peuvent permettre en classe.

L'article « Savoir professionnel « de terrain »: imposer la formation professionnelle dans un contexte pratique » de Augusto Riveros et Melody Viczko explorent l'écart existant entre les « scénarios » créés pour la pratique professionnelle en milieu scolaire et ceux élaborés pour le développement professionnel. Utilisant la Théorie de l'Acteur-Réseau, ils se questionnent sur la CPA ou « communauté professionnelle d'apprentissage », concept devenu la structure de référence en développement professionnel des enseignants. Comme le suggèrent les auteurs, la Théorie de l'Acteur-Réseau peut fournir un cadre de référence pour adapter le développement professionnel à un contexte particulier. Cette théorie peut favoriser le déploiement d'initiatives de développement professionnel tenant compte davantage de « l'assortiment hétérogène » des acteurs et réseaux cohabitant dans les écoles. Ceci inclut les problématiques de conflits, où la réforme en elle-même comporte une partie de l'assortiment et la négociation de ses intérêts. Par la suite, Riveros et Viczko utilisent ce cadre pour analyser le cas d'une réforme effectuée dans une école albertaine. Ils concluent leur article en suggérant que les interactions entre les enseignants, les étudiants et

les objets génèrent du savoir et que les futures recherches devraient porter une attention particulière à ces interactions et leurs traces dans les classes.

L'article « La formation professionnelle des enseignants comme recherche du bien commun : discussion du rôle des écoles de stages (*demonstration schools*) dans la formation des enseignants » de Tony Loughland retrace les origines des initiatives récentes du gouvernement australien concernant les écoles de stages. Traitant en premier lieu du cas australien, mais abordant aussi les contextes anglais et américain, Loughland soutient que les changements de politiques comme les Centres d'excellence en formation des enseignants créés en Australie rappellent les écoles de stage. Cependant, ceux-ci ne présentent pas une compréhension entière de la signification du modèle : « Ce « a-historisme s'accompagne de la propension des gouvernements néolibéraux contemporains à se concentrer davantage sur la création de mesures de performance plutôt que sur l'exécution appropriée du processus, ceci incluant la reconnaissance des modèles historiques. » Loughland dresse un portrait historique du rôle des écoles de stages sur divers continents. Puis, il analyse le cas d'une école située à Sydney, utilisant ce cas comme contrepoids aux politiques gouvernementales descendantes. Comme Loughland le souligne, les initiatives authentiques d'apprentissage professionnel requièrent un support à long terme. Les cibles à court terme doivent être évitées puisqu'elles peuvent ébranler le type de culture d'apprentissage et l'appui des enseignants comme professionnels affiliés aux écoles de stages.

Dans leur texte « L'expérience d'un stage international comme élément influent sur le développement de futurs enseignants », Nancy Maynes, John Allison et Lynn Julien-Schultz abordent les questions relatives aux impacts d'un stage effectué à l'international par des enseignants canadiens en cours de formation : l'expérience d'une vie. Supervisant ce stage international, les chercheurs ont accompagné dix-sept enseignants masculins et féminins âgés de 22 à 28 ans. Les futurs enseignants ont travaillé pendant trois semaines dans des écoles primaires et secondaires gérées par une organisation non gouvernementale au cœur de la campagne kenyane. Neuf mois après la fin de leur stage, les chercheurs ont soumis les stagiaires à un questionnaire électronique composé de questions ouvertes, dans le but d'en connaître davantage sur leur expérience. Onze enseignants et les chercheurs ont répondu à ce questionnaire, réfléchissant sur cette expérience ayant changé leur vie. Cet article porte sur la façon dont les futurs enseignants perçoivent l'impact de leurs croyances personnelles sur leurs pratiques personnelles et professionnelles. Il traite également de la manière dont leurs visions du monde et leur approche pédagogique ont été influencées par leur expérience d'enseignement dans le sud. Les auteurs suggèrent une piste pour des recherches futures, soit recueillir des données longitudinales sur les impacts à long terme de telles expériences sur les méthodes pédagogiques utilisées en classe par les enseignants, particulièrement en ce qui a trait aux problématiques de la justice sociale.

Lauren Segedin, par son article « Écouter la voix de l'élève : comprendre les facteurs scolaires limitant le succès de l'élève », donne la parole aux élèves à risque, faisant connaître leurs points de vue et sentiments – habituellement ignorés – sur leur expérience de la répartition par niveaux. Ses travaux révèlent aussi les difficultés de grouper les élèves par habiletés et les conséquences sur la réussite scolaire. Les cas vécus de certains étudiants mettent en lumière quelques-uns des problèmes persistants du système d'éducation publique. Prenant appui sur le point de vue de la pédagogie critique, ses travaux posent des questions essentielles sur les buts et structures de l'école publique. Quelles connaissances les élèves acquièrent-ils? Pourquoi le système est-il organisé ainsi? Pourquoi l'enseignement est-il prodigué de cette manière? À travers des histoires profondément émouvantes, Segedin expose avec adresse de quelle façon la répartition des élèves par niveaux, les programmes et les attentes des enseignants dressent des barrières au succès scolaire. La majorité des étudiants au secondaire ont mentionné le peu de pertinence pour leur vie présente ou future d'un programme conçu pour répondre aux besoins futurs des élèves se destinant à l'université. Être « à risque » et dans le cheminement appliqué est vécu par ces élèves comme une honte et une tare. Cette impression entraîne un statut moins valorisé et des attentes académiques de leurs enseignants encore plus basses. L'impact le plus pénible de ces faiblesses du système est la tendance de ces élèves à se blâmer pour leurs échecs. À cet égard, les travaux de Segedin invitent les enseignants, les chercheurs et les gestionnaires scolaires à réexaminer les problématiques en adoptant la perspective des élèves. Ils exhortent également ceux-ci à considérer des manières de transformer l'école en expérience valorisante et porteuse de sens pour *tous* les élèves.

George Zhou, dans son texte « Une perspective culturelle des changements conceptuels : Réexaminer le but de l'enseignement des sciences », s'intéresse à la portée des expériences culturelles, notions et valeurs des élèves sur l'apprentissage des sciences à l'école. S'inspirant des théories postcoloniales et sur des recherches culturelles portant sur l'enseignement des sciences, il met en lumière l'espace hybride au sein duquel cohabitent les cultures du quotidien, de la Culture et de la Science et où l'apprentissage scientifique se réalise. Zhou avance comme argument qu'un conflit entre ces cultures peut empêcher les élèves de développer une compréhension conceptuelle signifiante de la science. Indiquant les forces et limites des modèles conventionnels de changement conceptuel, Zhou recommande une approche basée sur le débat pour mettre de l'avant l'apprentissage conceptuel des élèves. De plus, les débats pourraient impliquer davantage les élèves dans un processus d'apprentissage tenant compte d'une variété de points de vue sur le monde. Celui-ci est convaincu que cette approche argumentaire permettrait aux élèves « d'apprécier » les points de vue scientifiques et les motiverait à s'impliquer plus activement dans la construction de savoir scientifique.

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A.A., A.C., S.P., & T.S.W.

RÉFÉRENCES

Harper, S. (janvier 2012). Allocution spéciale de Stephen Harper. Dans K. Schwab (Président) *The great transformation: Shaping new models*. Allocution prononcée à la rencontre du Forum économique mondial de Davos-Klosters en Suisse. Vidéo provenant du site internet du Forum économique mondial de Davos : http://www.weforum.org/videos/special-address-stephen-harper-annual-meeting-2012

TECHNOLOGY AND CURRICULUM: SHADOWS AND MACHINES

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ABSTRACT. The influence of technology in today's classroom is undeniably ubiquitous and scattered, and though the practice of conceptualizing technological application emerges from within an already contested and highly politicized field of human relations, when approached in the context of curriculum, this contestation takes on new significance. In this paper, I construct a claim that, when introduced into the sphere of education, technology brings its own *curricular shadows*. I argue that while certain technologies seem to place restrictions on a learner's capacity for expression and experimentation, these restrictions are by no means absolute or immovable, and that to think through technology aesthetically is to posit the presence of alternative possibilities and meanings. The performative potential of technology is here considered as within a dialogue with the curriculum-as-lived-experience, where learning necessarily exclaims its ambiguity as a forever-fluctuating relationality.

LA TECHNOLOGIE ET LES PROGRAMMES: OMBRES ET MACHINES

RÉSUMÉ. De nos jours, l'influence de la technologie au sein des classes est indéniablement perméable et répandue. L'utilisation d'applications technologiques conceptuelles émerge d'un domaine des relations humaines largement politisé et déjà contesté. Cependant, cette contestation, lorsqu'étudiée dans le contexte des programmes, prend un tout nouveau sens. Dans cet article, j'énonce que la technologie, une fois introduite dans la sphère éducationnelle, crée des zones ombres sur le programme. Je soutiens que, même si certaines technologies semblent restreindre la capacité de l'apprenant à s'exprimer et expérimenter, ces restrictions ne sont en aucun cas absolues et inébranlables. En fait, considérer la technologie de manière esthétique équivaut à postuler l'existence de possibilités et sens alternatifs. Le potentiel performant de la technologie est considéré ici comme faisant partie d'un dialogue avec le programme comme expérience vécue, au cœur de laquelle l'apprentissage exprime son ambiguïté comme relation toujours fluctuante.

INTRODUCTION

> What of curriculum as itself a search for meaning? (Greene, 1995, p. 89)

Technology, like the unspoken assumptions of educational practice, is often encountered as a type of indeterminate "black box." Though we see its external effects and ostensibly witness its outward shell — at times with bursts of enthusiasm or shudders of trepidation — we hardly tread to the questions at the core: the psychic and corporeal inheritances enmeshed and glimpsed, yet generally taken for granted. Often seen as the governing scriptural arrangements of the educational domain, the meaning of that which we take as "curriculum" is also frequently contested; a term held by some to represent a dynamic and forever-fluctuating conversation, and by others as prescriptive policy. While the influence of technology and technological structures in today's classrooms is undeniably widespread, when taken up in the context of curriculum and pedagogical practice, this strange and scattered presence sustains a new species of significance, hardly straightforward or secure.

As educational historian Herbert Kliebard (1988) noted, "in any time and place, what we call the ... curriculum is actually an assemblage of competing doctrines and practices" (p. 19); and for curriculum theorist Ted Aoki (2005), "the term curriculum is many things to many people" (p. 94). Kieran Egan (1978/2003) has summed up the field of curriculum study broadly as "the study of any and all educational phenomena" (p. 16). When conceptualized merely as the documents and theories that legislate the transmission of teaching and learning — what comes before and organizes empirically the spatial and temporal trajectories of classroom life — the curriculum is undoubtedly situated as a fixed entity, imagined as something effortlessly applied. This linear movement, however, which imagines that learning has a fixed beginning and end, ultimately kills the curriculum's capacity for contemplating the complications of sociality, instability, and change, evading its vicissitudes as a "live tension" (Aoki, p. 362), whose pressure alerts us to the ways that experience should be viewed as a creative problematic and a complex endeavour, rather than simply as something that is given. This paper seeks to explore the influence that technology has on structures of classroom power, through which the curriculum itself becomes iterated and made manifest. In such moments, we can observe the ways that technology composes its claims on the bodies and minds of teachers and learners, effectively voicing its own curricular utterances in the interminable dialogue that is educational experience. I here draw attention not only to the manner in which technology functions in popular discourse — in reference to machines, computers, digital texts, etc. — but also to the idea of technologies of schooling taken more broadly; the ways in which objects and tendencies of the natural world (of which humans form a crucial part) are impressed upon by the epistemologies and assumptions of technological structure.

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As a way of framing this discussion in a manner that allows the concept of curricular shadows to interact with the world of educational practice in a material fashion, I will begin by introducing an episode from my own educational past as a high school student, which despite — or perhaps because of — its quotidian and trivial nature, touches on some of the important dynamics in the relation of education and technology. As the past itself acts as a shadow on the present, influencing the shapes we see and the world we project, I move back and forth here in an act of creative remembering, and, as I remember my fractured nature in mid-adolescence, I also appreciate that such acts of remembering are themselves endeavours forever fractured and fracturing. In regards to the trope of the curricular shadow — and though I consider it significant that, in operating under cover of shadow, shapes are notoriously difficult to pin down and delineate — I recognize that such an idea only makes sense if some type of reference is made to the object (whether cultural, historical, psychic, or otherwise) that is responsible for the shadow's casting in the first place. While I dispute the notion that this casting of curricular shadows might derive from any one foundational location (whether education's own past, a teacher's hopes, or a student's desires), my hope is that the incident I relate works to illustrate the play that is inherent between the relation of a shadow and its object, between the curriculum as an abstraction and as a lived reality. Throughout this paper, I thus make repeated reference to this initial encounter, in a manner that is intended to render intelligible the subsequent threading-through of my argument.

The particular episode that I wish to explore concerns a class that fell immediately after lunch, and as any teacher would agree, there are no infallible methods of making new meaning from the energies and antics of the lunch hour, itself an organizing technology. During this gap time of the school day, students invariably make certain decisions dictated by their needs and desires alone, rather than those of teachers and educational administrators. As there is a degree of student freedom in the lunch hour, the contradictions that arise from layering this space of fewer fetters onto that of the institutionalized classroom can often lead to jarring and strident events and invectives. In fact, this time of day forces the awkward question: "To whom does the classroom belong?" More often than not, it is seen as the teacher's space *par excellence*, in which students are generally tolerated only so long as they are composed and respectful (though, having also worked as a high school teacher myself, I realize this is far from the whole story).

As I would enter this particular class, I would often stealthily sneak over to the classroom stereo system, which was located in an unlocked cabinet, and slip in some music undeniably at odds with the approaching lesson — Black Flag, The Geto Boys, Born Against, Napalm Death — cranking the volume knob all the way up, prompting a sound I considered indisputably repellent to the adult ear. I would then shut the cabinet doors, and move swiftly to

my desk. As the teacher went to turn the stereo off, she would be forced to open the cabinet, which had muffled much of the music, to a sound that was thunderous and almost material. Surprisingly, this teacher also repeatedly made the choice to forgo any kind of reprimand, directing us, instead, straightaway to the day's lesson. Even though she ignored my provocation — a perversion of various classroom technologies — the balance of classroom power was nevertheless distinguished as a negotiable thing, where, through making use of the classroom space and its related technologies, a student might insert their own commentary on the often-incontrovertible fact of pedagogical authority. As I understand it, the teacher's disregard was a silent announcement; a sort of unspoken acquiescence.

The technologies of schooling involved here are numerous, and the assumptions they carry are many: the temporal and spatial splitting off of the school day, the placement of desks, the wooden cabinet and its unlocked doors, the stereo system, the rules and knowledge of discipline, the expected roles of student and teacher. In this configuration of folding and bisecting technologies, commentary, no matter how absurd or seemingly innocuous, is often all that is needed to show a chink in the armour. This gap and crevice, a trace of curricular shadows, is an invisible commentary whose presence is often ambivalent and unspoken, yet also inevitably discloses potential.

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When the materials of learning are neatly separated, in theory, from the moments of learning (in practice this is always an impossibility), something important is being lost in our imaginings of what learning is and what it could be — whether knowledge stands as complete and fixed, or as something accessible that we can touch and transform. The basic and quotidian material technologies of learning — whether pencil, textbook, desk, chair, cabinet, stereo, computer, soccer ball or hallway — which in themselves and their historicity are really not so basic, are here understood as neither dead nor inert. Like the learner's own capacity for engagement with new and sometimes difficult knowledge, technological objects — and the spaces they occupy — carry traces of past situations, whether from five years or five minutes ago, foisted on the conditions of present pedagogy, marking their trail in a forward futural motion. They bring their own curricular tones and shadows, whose substance is certainly far from neutral. In this manner, Aoki (2005) wrote of the "curriculum-as-plan [as] the work of curriculum planners," and that "as a work of people, inevitably, it is imbued with the planners' orientations to the world ... their own interests and assumptions about ways of knowing and about how teachers and students are to be understood" (p. 202). Technology, as an instance of some such constructed material, when implied in the classroom — with both an identifiable *and* what we might call an unconscious history of use and design — is therefore not a dead or silent thing of exhausted possibility, or just a user-friendly tool absent

of any epistemological influence. The questions I am presently posing, then, concern the methods of organizing and understanding the world that technologies carry and suggest, the types of conclusions and consciousnesses they cultivate and desire, how we position ourselves towards them in the networks of pedagogical practice, and as Bronwen Low (2008) put it, "the ways youth are reading and writing their worlds" (p. 145). Similar to the manner in which Wen-Song Hwu (2004) took up Jacques Daignault's concept of *composer* to articulate relations of *expressing* as a "present, ongoing process" (p. 197), the student, in *expressing* their subjectivity, might also compose claims that play off and through the teacher's composure, and off and through various folds of technological landscapes. For teacher and student — each of whom is forever vulnerable towards the other — such play is multiple, nomadic, interminable, and always unforeseen; the point, as Hwu noted, is "to *multiply* the definitions, to invite a plural spelling" (p. 183).

UNDERSTANDINGS OF THE TECHNOLOGICAL

There is no denying that the influence of technology in today's classroom is ubiquitous and scattered; both in terms of how pedagogical material is composed, compiled, and presented, and also with regards to the devices and knowledges that students themselves bring to situations of schooling — a familiarity that often strips the veneer of learning as a route with only one path, as direct communication from teacher to student (indeed, when it comes to certain technologies, the student often knows more than the teacher). The period of questioning whether to allow technological objects such as computers into our schools has passed. The questions must now be posed differently. "The new technology is here," Michael Apple (1988) noted, "it will not go away" (p. 307), and this statement is as true now as when he first composed it. Technology, however, is always "more than its tangible products" (Pearson & Young, 2002, p. 2), and should therefore not be defined simply by its physical manifestations in high-tech, machined, and industrial invention, categories of use that are themselves hardly secure. As we can see in such an infinitely emergent field as "new media," with its continuous lack of a settled locus, there is a "terminological instability" (Zylinska, 2009, p. viii) to the very notion of technology. Understood broadly, the practice of technology, as I here define it, is that which sees humans modifying the products and contingencies of "nature," or that which is taken as "natural" in any given context, to meet their needs, through the use of various artefacts, languages, tools and devices. In this, as Andrew Feenberg (2006) put it, "technology is concerned with usefulness rather than truth. Where science seeks to know, technology seeks to control," to which he also adds the caveat that "this is by no means the whole story" (p. 5). In fact, our definition of technology also includes a wide range of knowledge and prospects for knowledge production, including the cognitive processes involved in the manufacture and operation of technological equipment, and

the mathematics, grammar, syntax, affective attachments, and aesthetics of design. For Judy Wajcman (2009), technology is "a seamless web or network combining artifacts, people, organizations, cultural meanings and knowledge" (p. 106). It includes, therefore, not only what we use in the classroom, but also the reasons why we use them, the histories of their use, and the explicit and implicit principles governing our relations with them.

But to broadly define technology is not enough, for we have still have not made any substantial claims about its consequences over and with everyday human interaction. The conceptual approach that I take toward the potential effects of technology is one of ambivalence, and which points both to its faults and, also, to its possibilities; as something that "frame[s] not just one way of life but many different possible ways of life, each of which determines a different choice of designs and a different range of technological mediation" (Feenberg, 2006, p. 13). As such, my views regarding technology are not unreflectively optimistic or pessimistic, but proceed with a sustained scepticism regarding its purported uses for seemingly democratic, or emancipatory, purposes; though we should also be careful not to exclude the possibility of such interventions from the outset, a qualification that becomes especially important when looking at the context of educational spaces.

In understanding the curricular influence that technology brings to education — the shadows it casts on the nature of learning — and given that technological outcomes are never known in advance, the presence of technology is best seen as something not immediately dismissed *or* automatically welcomed. Since, "in classrooms ... curriculum becomes a social practice" (Pinar, Reynolds, Slattery & Taubman, 1996, p. 744), the encounters that teachers and students have with technology offer a unique vantage point from which to assess the sociality of learning as an endeavour influenced by multiple and fluctuating points of entry and engagement. If we think back to the story that frames this discussion, the meaning that is produced from the encounter of music and school, student and teacher, time and space is far from unambiguous, but what *is* clear is that the creation of meaning, in educational spaces, is necessarily an ambivalent process, forever renegotiable through various technologies, the values they bring, and the imprints that humans inscribe in their use.

Technology in the classroom, a description of the discussion

Inquiring ethnographically into the influence of technology in Los Angeles' public schools, Torin Monahan (2005) described the persistent and powerful mythologies that have all but permeated the rhetorical field. Firstly, he wrote that the dominant view of technology that he has encountered in the course of his research is one that can be generally characterized in deterministic terms, "as advancing in unidirectional evolutionary fashion" (p. 183). From this point of view, to question the advance is to unwittingly situate oneself as questioning the inevitable and as resistant to the necessary nature of change

and technological evolution. Secondly, Monahan wrote that technological objects are usually positioned simply as *tools*, as instruments of use whose objective neutrality is simply beyond question. From this point of view, the sole purpose of a classroom's stereo system is to further the ends of learning as outlined through official channels. Any other use would, therefore, simply be a perversion. Lastly, these objects are often construed as "universal correctives to social inequalities" (Monahan, p. 183), whose social benefits for students and teachers — in regards to literacy, the job market, and keeping up with the competitive challenges of a changing and globalized world — far outweigh any possible negative consequences. This is similar to Herbert Marcuse's (1964/1991) conception of the "Happy Consciousness," which operates according to "the belief that the real is rational and that the system delivers the goods" (p. 84). Even though, as consumers and users, we may be aware of the harm that could eventually accrue from a purely rational vision of technological unfolding, it might nevertheless be psychically easier to focus only on the categorically advantageous.

For Monahan, the danger in the perpetuation of such myths lies not in their assumed veracity, or their claims as transcendental truth, but in their ideologically-inflected rhetorical thrust toward "a literal reign of silence" (Feenberg, 1999, p. 101); that by means of the assumed neutrality with which technologies are invested, "they deflect inquiry into emerging power differentials" (Monahan, p. 183). In other words, if we insist that the figure of the teacher is the only arbiter of whether or not a technological object, such as a stereo system, is used correctly, we mask the potential for technology to be taken up in ways unprescripted by the traditional balance of classroom power. Sometimes the unnecessary is simply the unintended, while the accidental might always have more value and use than the anticipated.

In positioning technologies as apolitical tools, they are construed as invariably flexible objects that can easily adapt themselves to individual needs, understood as conceptually distinct from the social matrix of human relations and systemic inequalities. Such a rhetorical move works to shut down alternative considerations by appealing to a common desire, which, as humans, we all possess, for some sense of control over our surroundings. By exclaiming that technology is only a tool, we distance ourselves from the technological choices we enact and their social consequences, while also seeking to confirm a guarantee of human agency as something sustainable; "that *we* are in control, not our machines" (Robertson, 2001, p. 14, emphasis in original). Against this assurance and false pride, I agree with Langdon Winner (1986), in his classic assessment, that tools are never neutral, but since they inevitably tolerate particular movements and disallow others, have a number of political qualities built in. For though the tool, seemingly immobile and passive without the endowment of human touch, may appear as naturally innocent as a rock or a blade of grass, it shapes and enacts a disciplinary pressure both on the tasks

at hand and on its users; in actuality, "the doer is transformed by its acts" (Feenberg, 1999, p. 206). The tool motivates certain decisions that might otherwise have remained unthought; for not only is it true that, "hammers don't work well with screws," but "when you are carrying around a hammer, everything starts to look like a nail" (Robertson, pp. 14-15).

To segue into a discussion concerning the ideological implications of technology and education, I will here turn briefly to Alfred Borgmann's (1984) writing on the "concealments" embedded in technological devices. In his analysis of what he labeled "the device paradigm," Borgmann argued that as machinery becomes understood in its nature as device and commodity, it necessarily masks its inner workings. As we come to expect technological devices to appear to us in their capacity as *function* — ready-made and ready-to-use, "without the encumbrance of or the engagement with a context" (p. 47) — we lose a sense of the burden normally associated with the often-unpredictable nature of non-commodified relationships.

This idea resembles Martin Heidegger's (1977) argument regarding the dangers of modern technology, through which humans are charged with positioning objects in the natural world, such as rivers, as a type of "standing reserve," which implies that they are ready to be ordered about and called to deliver. For Heidegger, this danger is further complicated by the fact that humans don't recognize the ways in which they themselves, in their ordering of what they consider to be a "standing reserve," become simply another type, a different category, of this same "standing reserve." When things are ready and arranged, without us even having asked them to be, we generally don't find the need to question why or how; we have other things on our minds. For Aoki (1987/1999), who adopted a Heidegerrian questioning in relation to computer application, in assuming his position as the "orderer of this 'standing reserve' ... man tends to be forgetful of his own essence;" he thus endangers himself and his projections for the future, "no longer able to encounter himself authentically" (p. 170). If, as William Pinar (2012) noted, technology represents a potential "concealment of reality" (pp. 135-136), and if, "in bringing reality into conformity with our dreams, reality disappears" (p. 143), then we can also ask whether, through this dismantling of reality, we are not also disavowing our dreams as well. As the dream is only the fulfilment of a wish in relation to reality, without reality, the dream disappears: *it has no subject*.

On this point, Borgmann wrote how, "the concealment of the machinery and the disburdening character of the device go hand in hand," since "a commodity is truly available when it can be enjoyed as a mere end, unencumbered by means" (p. 44). In this process of commodity production, through which the ends and the means that collectively form a context are severed and masked, one extolled and decreed as useful and the other as unnecessary and veiled, Borgmann illustrated his point through invoking the case of "technologically

transformed wine" (p. 49). In this example, the prestige conferred to particular types of wine is directly related to their *terroir*, their *provenance*, and their embodied historicity. Tasting a wine distinguished with such qualities is thus to taste more than simply a liquid that makes you light-headed and giddy, it is to taste in the ends a sense of the means. For Borgmann, "the world that is opened up in wine as a thing is closed off when it becomes machinery and commodity" (p. 49). From this understanding, the significance of such an immediately consumable product as box-wine is purely function and value, and bears no traces of the soil from which it was birthed.

While I do not want to extend this metaphor onto precarious ground, I am here motivated by the perils involved in qualifying education as an activity obsessed with the ends, concerned solely with the acquisition of data, and as something "technologically transformed." If the tool sculpts, even in some small way, the task at hand and its users, and "to consume is to use up an isolated entity without preparation, resonance, and consequence" (Borgmann, 1984, p. 51), then a curriculum that regards knowledge as—in its essence—something commodifiable, as linear data and textbook facts, also composes its claims on the learner *as* a specified type of inert body. For Heather-Jane Robertson (2001), something is skewed in this process that separates the learner from embodied histories of knowledge, and as she wrote, "skewing relationships means skewing the very guts of education" (p. 35). To put it simply, the meanings attributed to the action of a student or a teacher—opening or closing the cabinet doors, choosing to discipline or ignore—or to any activity whatsoever within the space of education, is determined by more than simply the end result. Meaning is as much a matter of perspective as it is a matter of history and of possible perspectives in history, many of which are drifting and vagrant, forgotten and left to the movements of time.

Curriculum conversations

But the question still persists: if the presence of technology in the classroom is not simply there as a tool, then in what capacity does it make its presence felt? As I have been arguing thus far, the import of any form of technology into the educational sphere is *always* the import of a curriculum, or what I refer to as a curriculum shadow, overlaid on, and bisected through, the one already present and lived into existence. Such a shadow impacts on the meaning/reading of space and time in the classroom, and brings the student and teacher into a dialogue with past, present, and projected pedagogical iterations, both from within the self and without. In this negotiation, the act of teaching, in its selection of curricular materials, and its inclination toward and through sets of pre-existing knowledge, is itself an inherently political act. For Apple (1990), in his desire to "see education relationally" (p. ix), dialogue about what *does*, and what *should*, take place in classrooms ought to always proceed with an awareness of the politically situated nature of the tasks of teaching and

learning as "caught up in the real world of shifting and unequal power relations" (p. viii). Clearly, as structures of institutionalized schooling are *de facto* spaces of embedded cultural reproduction, to analyze their activities as from within some sort of social vacuum would be to ignore their integral connection to the cultural, political, and economic institutions of the larger society in which they are located, institutions that may themselves be discriminatory on the basis of gender, race, class, sexual orientation, or age.

In "the technologized classroom" (Apple, 1988, p. 297), there is often an emphasis on that which is changing, and locating modifications, *in degree*, as authentic transformations *of kind*, and, rhetorically, as innovation, progress, improvement, and advancement. As Apple notes, this emphasis on difference distorts our understanding of what is really taking place, since "by focusing on what is changing and being changed, we may neglect to ask what relationships are staying the same" (p. 290). Whether learning is accomplished through means of a stone tablet or an iPad, or whether classrooms are framed by walls or windows, is not as important as the problem of whether the actual structures of the pedagogical relationship are themselves thrown into question. In this context, and with the articulation of technological change often steeped in an historical myth of predestined progress and "the inevitable present" (Monahan, 2005, p. 46), Apple's (1990) set of classic curriculum questions must here be enunciated anew. Only when such questions can be effectively responded to can we even begin to classify technological change, or *innovation*, as actual improvement or betterment: "Whose knowledge is it? Why is it being taught to this particular group, in this particular way? What are its real or latent functions in the complex connections between cultural power and the control of the modes of production and distribution of goods and services?" (p. 156).

Since the form and content of technological objects carry the potential for transmissions of an ideological nature, the question that must be posed in the present context is: How does ideology, as a facet of technology *as* curriculum, function; and what does it bring? As Monahan (2005) described it, "technologies alter the very composition of educational institutions ... hardwiring new power relations" (p. 2), and "operat[ing] as extensions of space" (p. 8). Monahan introduced the concept of *built pedagogy*, as the lessons that technological spaces teach us, "through affordances that privilege certain movements, activities, or states of being over others" (p. 34). Though of course, since the effects of teaching are never in simple correspondence with the effects of learning, while the ends of *built pedagogy* motivate, they do not necessarily determine. In a manner akin to Aoki's (2005) "architectonics of the curriculum landscape" (p. 201), Monahan points to the psychic imprints that develop in the socio-spatial construction of "teaching bodies what should and should not be done in silent, subtle, and insistent ways" (p. 34). The question for Monahan is not what technologies can and cannot do as tools or means

of instruction and evaluation, but "what social relations do they produce?" (p. 52), and, in the saturation of technological space and the "shap[ing] of human comportment" (Michael, 2006, p. 53), what forms of consciousness are effectively created and recreated?

Perhaps a more apt line of questioning, in this "disturbance of the curricular landscape" (Aoki, 2005, p. 204), would proceed not only to what technology *brings* to educational spaces, but what it *hides*: "what lies beneath the surface?" (Apple, 1990, p. xv), which types of knowledge are legitimized and which are delegitimized (Streibel, 1988)? In its often unspoken diffusion, technology brings a buried, latent, and "hidden curriculum," here defined as "the tacit teaching to students of norms, values, and dispositions that go on simply by their living in and coping with the institutional expectations and routines of schools day in and day out for a number of years" (Apple, 1990, p. 14). Regarding the nature of technological objects, where "functions are not intrinsic to the artifact" (de Vries, 2006, p. 21), this notion of embedded concealment is a question of design and distance, through which degrees of control by the maker or designer remain invisible yet present still. In educational practice, this notion includes the dangers implicated in the abstracting tendencies of technical and formulaic languages of learning, what Aoki (2005) has called a "striated language of ends-means ... written for faceless people in a homogenous realm" (p. 207).

What should be remembered, though, and which points to the possibilities of viewing technology as other than simply ideologically-inflected, is that the relation between user and designer, as lived out in the social reality of technological use, is never stable or fully pre-determined (Ihde, 2006). Similar to Michel de Certeau's (1984) understanding of reading, as an act where "everyday life invents itself by poaching in countless ways on the property of others" (p. xii), Tim Ingold (2006) has written of our relationships with technical objects as narrative-based, and that "to name a tool is to invoke a story" (p. 71). Ingold enunciated the similarities between tool-use and the narrative art of storytelling, wherein the implications and purposes of both are highly contextual and open-ended, and can only be meaningfully approached in their *use*. For a student to take up a pen (or to blast Napalm Death from the classroom stereo), and whether they do so of their own initiative, is a very different thing from compulsory moments of creative writing and the tracing of marks originally sketched by the teacher. Efforts to compose oneself creatively, in a space where the limits of correct composure seem firmly entrenched, nevertheless always preserves a sense of the possible that exists beyond the given. Both the given and the possible depend largely on the circulation of situational and environmental factors, and the constitution of consumption: how the reader/user/teller/writer is positioned in a social network. In this context, where "the text has a meaning only through its readers [and] it changes along with them" (de Certeau, p. 170), users/readers/learners bring their own stories to bear on the

conversation as well, presenting a unique opportunity to access the meaning of design, and the meaning of knowledge and educational experience, as something truly in flux. In appreciating a tool as an object with a storied history, Ingold wrote of the rhythms that arise in tool-use—as exclamations of embodied interpretation—not as monologic, monotonous and mindless, but instead, as carrying a "specific resonance ... in an environment where nothing is quite the same from moment to moment" (p. 76). In this context, Ingold instils the user with an agency and aptitude for learning not typically encountered, which positions the student as an integral component of, and player in, the socially embodied "contest of interpretations" (Feenberg, 1999, p. 84).

In re-envisioning the possibilities of technology in the educational sphere as something other than wholly negative and disempowering, it will also be helpful if we touch on Aoki's (2005) "folded view of curriculum" (p. 322). As mentioned previously, there are no straightforward understandings of what curriculum is or should be, though when brought up in relation to mandated programs of study, and the drafting of lesson plans and study guides as conceptual contracts, it designates the disembodied nature of the "curriculum-as-plan," what for Aoki is "an abstraction yearning to come alive in the presence of teachers and students" (p. 231). The pedagogical situation, however, which runs the gamut from test-taking to the manner in which a student enters a classroom after lunch hour, is never one of strict correspondence, and consists of a forever negotiated "living in tensionality" (p. 159), as teachers and students find themselves "indwelling" (p. 159), sometimes precariously, in between two separate spheres of curriculum demands, which themselves passionately resist integration. The first is that of the preplanned, instrumental understandings of the curriculum landscape, which operate in a "fiction of sameness," and wherein "teachers are asked to be doers" (Aoki, p. 160).

Apart from this exceedingly normative framework, the second mode is the mode of curricular being that can only be articulated in the ambiguous and embodied potential of classroom experience. Referred to as the "curriculum-as-lived," this situated curriculum consists of the unpredictable, the improvised, the "unplanned and unplannable" (p. 322). Teachers, though, cannot choose to occupy one curriculum field over the other, and must forever reconcile themselves and their material situations anew, acknowledging the tension that comes from "living simultaneously with limitations and with openness, but also that this openness harbours within it risks and possibilities as we quest for a change from the is to the not yet" (Aoki, p. 164).

From this vantage of the curriculum landscape, we are presented with a "hermeneutic problem of the relationship between the general and the particular" (Aoki, 2005, p. 155), between the mandated and the lived. To think of technology instrumentally, and only in its capacity as an abstract "application," or as the reproduction of a predetermined set of generalized principles

in particular situations, is to ignore the Gadamerian fusion of horizons, the clashing of desires, and the meeting of worlds that determines classroom experience. For "what the situation demands must not be ignored" (Aoki, p. 155), and in Aoki's view, technology must be understood in its forever-fluctuating relationality, and at every moment in a new and different way, in "a tension between the appearance that presents immediately to us and that which needs to be revealed in the situation" (Aoki, p. 156).

Since "the task of application" is here understood as a "dialogue between the language of ... technology and the language of the ... education situation" (Aoki, 2005, p. 155), Aoki's approach to bilingualism will also help us to further appreciate this dialectic. To venture conceptually into the sphere of a second language is not here put forward as simply a technical task of appropriating a linguistic code, but a circular and hermeneutic endeavour of "being-and-becoming-in the world," and to "belong to two worlds at once and yet not belong to either completely" (Aoki, p. 243). Admittedly, I'm here taking up the idea of language broadly, and as itself a type of communicative technology. Thought in this way, the statements that are prompted by a student's actions, such as entering the classroom and appropriating the stereo, have a communicative, though not necessarily linguistic, function. The practice of being and becoming bilingual is thus to live in a similar tension to that of someone who uses technology — to stand engaged in a dialogic dialectic, of questioning between the known and the unknown, and with "an understanding of education as a leading out and a going beyond" (Aoki, p. 243). This is a position of unknown possibility that is often ambiguous and difficult, though which also holds a potential that can be transformed, accessed, and harnessed — in no insignificant way — by the user's own intentions, intuitions, knowledge, and history. For the teacher and the student, to stand and face one another, to press play and stop on the stereo, is to operate in (at minimum) a field of bilingual intention, for teachers don't always speak the same languages as their students.

Possibilities for technological manipulation: Animating the shadows

As I have outlined thus far, when thinking of education as a task without distinguishable *means*, or whose inner workings, ambiguities and motivations remain uninterrogated or thought of in context, there remains the danger of shutting down possibilities and alternatives in favour of a kind of predestined technological determinism. In regards to the corporeal and psychical curriculum impressions that technology leaves on educational spaces and participants, it now must be reckoned that forces of influence in both pedagogical and technological relations work multifariously: as both constraints on and endowments through relations of power, and in always more than one direction; subjective relations that create subjects, but that also endow these subjects with power. Moreover, the users of technological objects (whether virtual or otherwise,

student or teacher, young person or adult) always possess the potential for moments of resistance in consumption as an active practice: in manipulation, manoeuvrability, perversions and reimaginings of time and space, and the triggering of unintended consequences and alternate functions. If "technology is power in modern societies" (Feenberg, 1999, p. 131), and if the orientation of power is never something that is fixed, then it is worth inquiring into the means by which power can be accessed, as Maxine Greene (1995) put it, by those "feeling [themselves] on a kind of verge ... to carve a space in which [they] can break the peculiar silences and choose" (p. 117). Above all, this is a tension between desire and constraint, and of individual and social struggles to subvert a given law, reminiscent of the fact that, as Deborah Britzman (2003) wrote, "there are always two simultaneous dimensions of social life: the given and the possible" (p. 222). The important question, then, is how desire—despite its predilection to that which is perverse and elusive—is made manifest.

Though it might often seem otherwise, the trajectory of the "tactics of consumption, the ingenious ways in which the weak make use of the strong" (de Certeau, 1984, p. xvii) is never fully foreclosed. To revisit de Certeau, the impulses of consumption — a "secondary production" — are devious and scattered, though also powerful in their ability to insinuate themselves silently in the "network of an antidiscipline" of the everyday (p. xv). In the social conduct of living amongst others in disciplinary spaces, and where order and presupposition are "tricked by an art" (p. 26), de Certeau provided the example of what in the language of French factory labour is called *le perruque*, or "the wig," a false front put over on what is otherwise presumed as "necessary" and "natural": "the worker's own work disguised as work for his employer" (p. 25). As the student who scribbles notes in the margins of her notebook to herself, whether nonsensical doodles or deeply subversive tracts, or who uses a technological object in an unintended fashion — deliberately or not — but who otherwise appears immersed in the task handed down to her from others, this "esthetics of '*tricks*'" and "ethics of tenacity" point to always available resources "in the very place where the machine ... reigns supreme" (p. 26, emphasis in original). Though, as an adolescent, I may have been subscribing to many of the mandates of being a good learner, I learned early on that there is more than one way to skin the cat called school. In territory that can never be fully claimed as her own, the student can nevertheless always insinuate traces of her use on the structure of pedagogical objects and spaces — provocations of consumption that shift from notions solid and certain, to those invested with energies dynamic, fluid, and creative.

In this ambivalent relationship through a "margin of maneuver" (Feenberg, 1999, p. 113), the instrumental division between producer and consumer in the pedagogical sphere — where students and teachers are simply "stomachs or furnaces" and "don't create [since] someone else does that" (Apple, 1990, p. xiii) — is rendered ridiculous. In the gathering of education and technology,

as a space of aesthetic possibility "brought to life through performance" (Low, 2008, p. 129), Low wrote of how, motivated by the creatively transgressive ethos of Hip-Hop culture, young people "have seized control of some of the information and communication technologies" responsible for their very marginalization, "and reworked them into tools better able to express their experiences" (p. 130). From this understanding, my engagements with the stereo may have expressed a desire for interaction, perhaps to expressively mourn the passing of the lunch hour, a swan song for a kind of quotidian death.

Though her theorizing around a "poetics of technology" does recognize the historic subjugations, exclusions, and built pedagogy in contemporary technologies, Low also found "at the intersection of technology and language" (p. 132) — in expression and use — an arena for identificatory multiplicity and, more importantly, "a means of resisting unwanted demands and oppressive roles" (p. 144). In Hip-Hop *turntablism*, for example, the "scratch" is the strident and celebratory announcement of a chance encounter, an interruption, and a mistake. Through the embodiment, in the rap text, of technological interventions as "intentional misuses" (p. 132), with the imprints of the user scrawled as a smudged fingerprint on an otherwise technologically oriented space, it "makes rap a self-consciously flawed and fallible art form" (p. 133), and makes of technology not only an alienating force, but a useful tool in rethinking that which might otherwise be presumed as given or inalterable.

In this conduct of play and experimentation, at its heart a rebellious mode — though at times institutionalized and codified, always along with the possibility that it could be otherwise — these intrusionary "poetics of technology" reveal the mythic nature of digital stability, insinuating, instead, "that the information age," in which we find ourselves, "is a very noisy one ... in which people are addressed, invited, enticed, and coerced in a historically unsurpassed diversity and volume of forms" (Low, 2008, p. 138). What technology brings to the pedagogical situation, then, is hardly ever only one thing, but always a potential multiplicity, a planned structure — resistant to change but nonetheless malleable — taken up and played out (perhaps perverted) in the curriculum-as-lived-experience. The pedagogical travels of teachers and students in the context of their social lives and mediations are hardly impenetrable and inevitable affairs, and with young people as possible producers and distorters of an inherited script, they can always be roused in their learning and encouraged to claim it as their own, engaging "a certain art [in] placing one's blows" (de Certeau, 1984, p. 18).

The curricular shadows that technology brings, then, and its methods of organizing and understanding the world, can at times not only allow, but also inspire, an improvised and deeply imaginative aesthetic contamination. And far from being simply a regression or sign of incapacity, such contaminative energies might be a provocative, brash, progressively defamiliarizing, inter-

ruptive, and even at-times offensive, conceptual corridor to spaces of actual participation in everyday educational affairs. The shape that such involvement takes may be as explicit as an appeal put directly into words, or as concealed as the shape of a student's strut, or the appropriation of a classroom stereo. To be cognizant of the value of emergent technologies, the point is to remain open to possibilities and shapes that we might not yet recognize, and to allow that what we perceive today as the monstrous or problematic might tomorrow point to a better world, or at the very least, to an alternative way of looking at each other.

REFERENCES

Aoki, T. T. (1987/1999). Toward understanding "computer application." In W. F. Pinar (Ed.), *Contemporary curriculum discourses: Twenty years of JCT* (pp. 168-176). New York: Peter Lang.

Aoki, T. T. (2005). *Curriculum in a new key: The collected works of Ted T. Aoki* (W. Pinar & R. Irwin, Eds.). Mahwah, NJ: Lawrence Erlbaum Associates.

Apple, M. W. (1988). Teaching and technology: The hidden effects of computers on students. In L. E. Beyer & M. W. Apple (Eds.), *The curriculum: Problems, politics and possibilities* (pp. 289-311). Albany, NY: SUNY Press.

Apple, M. W. (1990). *Ideology and curriculum* (2nd ed.). London, UK: Routledge.

Borgmann, A. (1984). *Technology and the character of contemporary life*. Chicago, Il: The University of Chicago Press.

Britzman, D. (2003). *Practice makes practice: A critical study of learning to teach, revised edition*. Albany, NY: SUNY Press.

de Certeau, M. (1984). *The practice of everyday life* (S. Randall, Trans). Berkeley, CA: University of California Press.

de Vries, M. J. (2006). Technological knowledge and artifacts: An analytical view. In J. D. Dakers (Ed.), *Defining technological literacy: Towards an epistemological framework* (pp. 17-30). New York, NY: Palgrave Macmillan.

Egan, K. (1978/2003). What is curriculum? *Journal of the Canadian Association for Curriculum Studies, 1*(1), 9-16.

Feenberg, A. (1999). *Questioning technology*. New York, NY: Routledge.

Feenberg, A. (2006). What is philosophy of technology? In J. D. Dakers (Ed.), *Defining technological literacy: Towards an epistemological framework* (pp. 5-16). New York, NY: Palgrave Macmillan.

Greene, M. (1995). *Releasing the imagination: Essays on education, the arts, and social change*. San Francisco, CA: Josey Bass.

Heidegger, M. (1977). *The question concerning technology and other essays*. New York, NY: Harper Torchbooks.

Hwu, W.-S. (2004). Gilles Deleuze and Jacques Daignault: Understanding curriculum as difference and sense. In W. M. Reynolds, & J. A. Webber (Eds.), *Expanding curriculum theory: Dis/positions and lines of flight* (pp. 181-202). Mahwah, NJ: Lawrence Erlbaum Associates.

Ihde, D. (2006). The designer fallacy and technological imagination. In J. D. Dakers (Ed.), *Defining technological literacy: Towards an epistemological framework* (pp. 121-131). New York, NY: Palgrave Macmillan.

Ingold, T. (2006). Walking the plank: Meditations on a process of skill. In J. D. Dakers (Ed.), *Defining technological literacy: Towards an epistemological framework* (pp. 65-80). New York, NY: Palgrave Macmillan.

Kliebard, H. M. (1988). The effort to reconstruct the modern American curriculum. In L. E. Beyer, & M. W. Apple (Eds.), *The curriculum: Problems, politics and possibilities* (pp. 19-31). Albany, NY: SUNY Press.

Low, B. E. (2008). Jamming the signal: Rap music and the poetics of technology. In M. Hoechsmann & B. E. Low, *Reading youth writing: "New" literacies, cultural studies and education* (pp. 129-146). New York, NY: Peter Lang.

Marcuse, H. (1964/1991). *One-dimensional man*. Boston, MA: Beacon Press.

Michael, M. (2006). How to understand mundane technology: New ways of thinking about human-technology relations. In J. D. Dakers (Ed.), *Defining technological literacy: Towards an epistemological framework* (pp. 49-63). New York, NY: Palgrave Macmillan.

Monahan, T. (2005). *Globalization, technological change, and public education*. New York, NY: Routledge.

Pearson, G., & Young, A. T. (Eds.). (2002). *Technically speaking: Why all Americans need to know more about technology*. Washington DC.: National Academy Press.

Pinar, W. F. (2012). *What is curriculum theory?* (2nd ed.). New York, NY: Routledge.

Pinar, W. F., Reynolds, W. M. Slattery, P. & Taubman. P. M. (1996). *Understanding curriculum: An introduction to the study of historical and contemporary curriculum discourses*. New York, NY: Peter Lang.

Robertson, H-J. (2001). But it's only a tool! Deconstructing the defense. In M. Moll (Ed.), *But it's only a tool! The politics of technology and educational reform* (pp. 13-42). Ottawa, ON: Canadian Centre for Policy Alternatives.

Streibel, M. J. (1988). A critical analysis of three approaches to the use of computers in education. In L. E. Beyer, & M. W. Apple (Eds.), *The curriculum: Problems, politics and possibilities* (pp. 259-288). Albany: SUNY Press.

Wajcman, J. (2004). *Technofeminism*. Malden, MA: Polity Press.

Winner, L. (1986). *The whale and the reactor: A search for limits in an age of high technology*. Chicago, Il: University of Chicago Press.

Zylinska, J. (2009). *Bioethics in the age of new media*. Cambridge, MA: The MIT Press.

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PROFESSIONAL KNOWLEDGE "FROM THE FIELD": ENACTING PROFESSIONAL LEARNING IN THE CONTEXTS OF PRACTICE

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ABSTRACT. Based on a qualitative case study that examined elementary teachers' understandings of a professional development policy, we question the conceptual disconnection between professional learning and professional practices in some conceptualizations of professional learning communities. We analyse the research data using Actor-Network Theory and report that the teachers in the case study perceived a disconnection between the scenarios of professional knowledge creation and the scenarios of professional practice. Such disconnection is exacerbated due to an ambiguous treatment of the concept of professional practice in the policy documents that endorse the idea of *professional learning communities*. We conclude that a key element in the transformation of professional practices is the teacher's awareness that his / her professional knowledge is enacted through his / her actions and practices, thereby concluding that professional learning is situated in the context of professional practices.

SAVOIR PROFESSIONNEL "DE TERRAIN": IMPOSER LA FORMATION PROFESSIONNELLE DANS UN CONTEXTE PRATIQUE

RÉSUMÉ. Faisant suite à une étude de cas qualitative étudiant la compréhension d'enseignants du primaire à l'égard d'une politique de développement professionnel, nous questionnons la coupure conceptuelle existant entre la formation en milieu de travail et les pratiques professionnelles au cœur de certaines conceptualisations d'une communauté de formation professionnelle. Nous analysons les données de recherche en utilisant la Théorie de l'Acteur-Réseau. Nous révélons que les enseignants participant à l'étude de cas ont perçu une différence entre les scénarios de création de savoir professionnel et ceux de pratique professionnelle. Une telle coupure est exacerbée par l'utilisation ambiguë du concept de pratique professionnelle qui, dans les documents formulant les politiques, soutient l'idée de communautés professionnelles d'apprentissage. Nous en concluons qu'un élément-clé de la transformation des pratiques professionnelles réside dans la prise de conscience, par les enseignants, que leur savoir professionnel est activé à travers leurs actions et pratiques et est donc, au cœur de leurs pratique professionnelle.

In this article we aim to contribute to study of the relations among teacher's professional knowledge, teaching practices, and teacher learning. In a study conducted by Viczko (2009) on teachers' understandings of professional learning in rural Alberta, teachers reported a conceptual disconnection between their professional practices and the professional development initiatives put in place by their schools. We argue that the spatial and temporal disconnection that exists between the scenarios of professional knowledge creation and the scenarios of professional practice is problematic for professional development initiatives. We identify such disconnection in an approach to school improvement and reform that stresses teacher learning, namely, *professional learning communities*. This approach to school reform has been embraced by several jurisdictions in Canada, as evident in recent calls for school improvement through professional collaborative learning. Provincial policy documents in Alberta call for teachers and administrators to "continuously seek and share information and act on what they have learned . . . [concentrating their efforts] on improving their practice so that students can achieve the best possible results" (Alberta Commission on Learning, 2003, p. 37).

The above quote seems to suggest that professional learning in schools occurs in the context of collaborative teams and subsequently such knowledge is transferred to the context of classroom practices. Our analysis shows that embracing the conceptual distinction between scenarios of learning and scenarios of practice can lead researchers of professional learning to ask *how* to structure scenarios conducive to professional knowledge, instead of questioning *what* constitutes professional knowledge and practices in education. One such scenario has been provided by the creation of collaborative teams.

We tackle the second question by querying the assumption that the knowledge generated in collaborative groups impacts classroom practices. We support this contention by showing that there are sound theoretical challenges to the persistent conceptual separation between scenarios of knowledge creation and scenarios of professional practice.

The scholarship on teachers' professional knowledge has addressed the communitarian aspects of professional learning (Cochran-Smith & Lytle, 1993; 1999; Clandinin & Connelly, 1995; Connelly & Clandinin, 1999; Fenstermacher, 1994). However, we want to interrogate one specific approach to teachers' learning that has been endorsed with great enthusiasm by a large number of school jurisdictions and education policy-makers in Canada (Chambers, 2008; MacKay, 2007; Newfoundland and Labrador, 2008; Ontario Ministry of Education, 2007; Rubadeau, 2007; Saskatchewan Ministry of Education, 2008; 2007), that is, the idea of professional learning communities. Using an Actor-Network Theory perspective, we want to question the way professional practices and professional knowledge are conceptualized in this model. By doing so, we aim to investigate the ways in which teachers make sense of their own practices and knowledge.

PROFESSIONAL LEARNING COMMUNITIES AND THE POLICIES OF PROFESSIONAL DEVELOPMENT IN ALBERTA

In this section, we argue that the scholarship on professional development and particularly the literature on professional learning communities (PLCs) would benefit from interrogating the development of professional knowledge in schools. We exemplify our argument with some policies on professional development in the province of Alberta.

The term "professional learning community" has become commonplace in current school reform discourses (Alberta Commission on Learning, 2003; Alberta Education, 2006; Hord, 1997; Stoll et al., 2006; Williams, Brien, Sprague, & Sullivan, 2008). Nevertheless, Stoll and Louise (2007) reveal the ambiguity in the following widely accepted definition:

> There is no universal definition of a professional learning community, but there is a consensus that you will know that one exists when you can see a group of teachers sharing and critically interrogating their practice in an ongoing, reflective, collaborative, inclusive, learning-oriented, growth-promoting way. (p. 2)

Stoll and Louise (2007) propose their own definition based on an analysis of the terms that comprise the concept. According to their view, *professional* suggests that the knowledge held by the community is specialized and technical; such knowledge is oriented towards a "meet client needs" approach (p. 2). Professional knowledge fosters collective identity, commitment and a certain degree of control over practice and professional standards. According to Stoll and Louise, the word *learning* has been included because it signifies a collective effort towards a "common understanding of concepts and practices" (p. 3). The notion of *community* suggests an ethic of care focused on student learning: "the presence of professional community that is centred on student learning makes a significant difference to measurable student achievement. This is what gives the concept 'legs' to stand among other proposals for reform" (p. 3).

As stated by Stoll and Louise (2007), professional learning community is first and foremost a proposal for school reform that advocates for a conception of learning that brings about collective knowledge. Other formulations of the idea of professional learning communities follow the same line and propose the generation of collective knowledge as the means to achieve school reform. For example, Dufour (2004), and DuFour, DuFour, and Eaker (2008) proposed a model of professional learning communities that has gained widespread acceptance among schools in Canada and other countries. They define a professional learning community as educators working together in forms of collaboration and collective inquiry. Central to this approach is the assumption that "professional learning communities operate under the assumption that the key to improved learning for students is continuous, job-embedded learning for educators" (p. 14).

In DuFour et. al's (2008) model, school improvement is defined in terms of students' achievement; they indicate a positive correlation between teachers' learning and students' learning, and emphasize that teachers' learning occurs in the context of collaborative groups.

As noted in the introduction, the idea of professional learning communities has been enthusiastically embraced by several jurisdictions in Canada. In Alberta, the concept has been mentioned in several policy documents and nowadays forms part of the educational landscape in the province. We cite several examples below to show how the notion of professional learning communities has been fostered in the context of school reform in government policy documents. In doing so, we emphasize our quest in this paper to show that embracing the conceptual distinction between scenarios of learning and scenarios of practice leads to focusing on *how* to structure the scenarios conducive to professional knowledge instead of questioning *what* constitutes professional knowledge and practices in education.

At the provincial level, the Alberta government published several documents positioning teacher professional development as one key mechanism of school improvement and reform. To address capacity for teacher professional learning, the School Improvement Branch of Alberta Education published the policy document, *Improving Schools: Investing in our Future* (McEwen, 2006), providing a foundation for improving student learning and performance in schools. Linking staff development and student learning, teacher professional development was characterized as building teacher capacity for improving schools. Notions of professional development and professional learning communities were prevalent within this document as professional learning was characterized as "on-going, intentional and systemic" (p. 81).

With similar goals, the Alberta Initiative for School Improvement (AISI) aimed to improve student learning and performance through targeted funding that supported initiatives within the school jurisdiction's identified priorities. AISI funding was provided in three-year cycles to school authorities for specific local initiatives focused on improving student learning. Within the context of AISI, it was argued that teacher professional development builds capacity and influences teacher practice focused on student learning. This focus on student learning was positioned as leading to teacher inquiry and reflection, aimed at building teachers' capacity in knowledge and skills in the subject taught, pedagogical practices, and emerging technologies. Reflecting on the AISI experience, Parsons (2011) noted

> during early AISI cycles, professional learning communities (PLCs) were in vogue. Although PLCs have waned, their attributes and goals live on in Alberta schools. Professional learning has grown as teachers and administrators exchange and act upon what they learn to address specific challenges. These actions enhance professional effectiveness and improve student learning. (p. 23)

Regarding the specific actions to address the educational challenges of each school, Alberta Education (2003) released a policy document requiring teachers to develop annual professional growth plans taking into consideration the educational plans of the school and the local school division. Since planning for student success is one of the characteristics of a professional learning community, the provincial requirement for professional growth plans was easily incorporated into the functioning of professional learning communities (Alberta Commission on Learning, 2003).

In October 2003, the Alberta Commission on Learning released *Every Child Learns, Every Child Succeeds* to the Minister of Education, detailing the findings of public consultations about education. In the section entitled *Excellent Teachers and School Leaders,* explicit recommendations were laid out to expand on professional development:

> the vision for Alberta's schools involves every school operating as a professional learning community. This means teachers are actively engaged and involved in working together to continuously improve the outcomes for all students in the school.... For a professional learning community, teachers need experience and support in how to work collaboratively, share insights and ideas, and work as a team to achieve the best results in their schools. (p. 115)

In the report, the assertion was made that school-level control that focuses on student learning is needed in professional development for teachers, illustrating a direct relationship between "the content of staff development, the quality of staff development, and student achievement" (Reitzug, 2002, p. 241). In this way, teacher professional learning was characterized by the policy documents as locally driven, positioning teacher learning in communities as instrumental in producing knowledge to change practices that are explicitly linked to student achievement.

In the policy documents from Alberta Education, it is clear that professional learning for teachers is conceptualized as reflection and collaboration in collective settings. However, there is no understanding presented of how teachers' learning and practice should be linked. While scholars such as Cochran-Smith and Lytle (1999) have offered research to assert teacher knowledge as connected to practice, scarce attention have been paid to the link between teachers' learning and practice in the policy context, as evidenced by the policy framework in Alberta. How then should we understand the relationship between knowledge and practice in teachers' professional learning?

ACTOR-NETWORK THEORY, TEACHER PROFESSIONAL LEARNING, AND EDUCATIONAL REFORM

Fenwick (2010) has argued that an Actor-Network Theory analysis of school reform can offer concrete insights on how change processes happen within specific contexts of practice. In her view, artefacts and people interact in

ways that enact heterogeneous assemblages that are fluid, changing as people and artefacts exert influence on each other. A reform initiative can be seen as a process of struggle and negotiation among different actors that interact in the spaces of classrooms, schools, and districts. An Actor-Network Theory reading of school reform would view school change as the effect of assemblages interacting with each other. For example, Fenwick (2010) examined a case of large-scale reform initiative through the Alberta Initiative for School Improvement (AISI). In her account, AISI established itself as a "far reaching and durable network" (p. 108), comprised of teachers, administrators, and university professors linked through classroom materials, equipment, and websites. The AISI framework allowed schools to formulate and administer their own improvement initiatives as long as they pertained to the goal of student achievement. Fenwick showed how schools, universities, professional associations and government bodies generated dynamics that allowed them to interact with each other enacting the policy both at local and provincial levels. Speaking about these assemblages, Nespor (2002) said

> The point is that we need to understand "school change" as at least partially about the ways school practices are made mobile, and what and how they connect as they move. What are the structures of connections or linkages? What materials are they made of? How do things change as they move? How do connections change with this movement? (pp. 367 – 368)

Nespor's queries about these assemblages provide intriguing and salient points of conjuncture in the referenced case study. How are learning and practices assembled in the context of school reform? What are the linkages and connections between teacher professional learning and teacher practices? What materials are these connections made of? How do knowledge and practices change as they are moved between spaces? How do the connections between teacher learning and teaching practices change with this movement?

An Actor-Network Theory analysis of school reform initiatives focuses on the assemblage of interactions between actors as they are immersed in concrete situations bounded by cultural artefacts, other people, and social conventions. The practices that emerge within these assemblages enact the policy *in situ* creating a context for the reform initiative. However, according to Fenwick's (2010) study, the reform is not external to the networked assemblages of government bodies, school districts, universities and professional associations. The reform is enacted, mobilized and spread out within these assemblages. In Fenwick's view, Actor-Network Theory readings tend to shift from viewing "certain participants as 'reformers' and others as 'contexts' to understanding that all are part of materially heterogeneous networks that have unfolded geographically and historically and overlap and relate with one another" (Fenwick, 2010, p. 103). In Actor-Network Theory, knowledge is enacted and therefore cannot be separated from the practices in which it emerges.

In the next section, we will draw upon a case study of teacher professional learning in a school in Alberta, and examine how professional learning is conceptualized in policies and teachers' understandings of their own professional development. We will discuss the case study using an Actor-Network Theory perspective, we will draw some conclusions and then we will advance our own 'modest proposal.'

PROFESSIONAL LEARNING AT VALLEYVIEW SCHOOL

Valleyview School (the name has been changed to preserve anonymity) is a public Kindergarten to Grade 12 school in mid-eastern rural Alberta. Valleyview School staff consists of 18 teachers plus a principal and vice-principal and has an enrolment of 289 students. While the data presented in this paper is part of a larger study, the interview data was collected in 2009 over an eight-week period with eight elementary teacher participants. One male teacher and seven female teachers participated in the study; one was part-time and seven were full-time teachers.

The semi-structured interviews involved open-ended questions meant to provide opportunities for the teachers to describe the various aspects of their professional learning, the policies in the school, school district, and province that related to their professional learning, and the aspects of their professional learning which were meaningful and helpful to their overall teaching. The interviews lasted between 30 to 60 minutes. Additionally, given that most of the professional learning in the school occurs in "communities" or group settings, a focus group session was held with all of the research participants following the scheduled interview sessions, providing an opportunity for the teachers to talk about their professional learning and reflect on their colleagues' perspectives. The interviews began with some initial questions for the teachers to reflect on their professional development. While each teacher referred to his/her own experiences, there were some commonalities between how they spoke about professional learning. The interviews were transcribed and the data were analyzed for emerging themes in the teachers' understanding of their own professional learning. We have chosen to keep quotations lengthy so as to allow the reader a contextual engagement with the teachers' points of salience about what professional learning meant for them. Also, we wanted to preserve the teachers' terminology in order to offer a more lively account of their experiences. With respect to terminology, the teachers in this study referred to the events of professional learning in the school as professional development (PD).

In Valleyview school, PD activities were divided into three levels: school-division level PD, school level PD and individual teacher PD. The school-division level PD was planned by the school division PD Committee, consisting of teachers and division office staff. They operated on a three-year PD plan based on the

school division priority area, which in this case was assessment. The school division was currently on year two of this three-year cycle. The school level PD was largely delivered through embedded PD time with two-fold priorities; most of the PD time was devoted to assessment related activities at school level, while other sessions might involve in-service PD to timely relevant topics, for example, public health. Individual teacher PD was characterized as needs-based and was embedded in the teacher's growth plan. Most of the elementary teachers chose to work in groups during this time, focusing on addressing the school priorities.

In reflecting on the organizational aspects of teacher professional development, the teachers often referred to how they thought a group-oriented structure was conducive to their learning; in fact, group work was often the focus of PD in both the school and school district level. Furthermore, the teachers indicated that they often chose to work in a group format for their individualized PD time, although this was not a required structural arrangement. One teacher was clear on this arrangement as she began discussing the whole school PD time. She highlighted how the group-oriented activities in her individual PD time were the most effective PD she had experienced.

> So the other PD days include sometimes the whole staff working on school goals, or we might have a guest speaker come in to talk to us about a topic.... So we have a variety of things to look at, but I'm finding the group work the most beneficial directly to my class for right now because it's what you wanted to work. It's what you feel that you need to have in your program. And the others are very helpful and they kind of give us the backbone and the background knowledge we need to accomplish these projects in our groups, so I think it's a good mix right now.

One group of interviewed teachers were working on a project that addressed the math priority area of the school division and the assessment priority area of the school. During the individual PD time, they chose to work as a group to find ways to write curriculum outcomes in "child-friendly language." This was identified as best practice in their school-level PD, and the teachers felt it was something tangible they could achieve in their individual PD time. In talking about this project, several teachers expressed their own and others' expectations that their learning during individual PD time was most beneficial because they chose to work collectively. Working with others in this capacity outside of teaching time resulted in a "constructive, organized day where we got something done and accomplished."

Another teacher echoed these sentiments when speaking about how the teachers were using ideas learned as a group in a specific workshop to change their teaching practices in the classroom: "Most of us are trying to work on our new math curriculum and work on the outcomes... we had a phenomenal guest speaker, Wendy Davidson, and we're trying to incorporate some of her ideas into our classrooms."

In talking about the same project, another teacher elaborated that working together in groups was a means for her to talk about and share strategies that could be used in classroom teaching. The idea that what they do in PD should be connected to their practice in the classroom was another key theme that emerged.

> And now this year with our structured PD, the assessment is moving into things that are much more helpful, like where can you go to find rubrics that might help you plan a better rubric for your class. Where could you go to get "I Can" statements, which is really effective for my posters, right?

In talking about what effective PD meant to one teacher, she indicated that she found PD to be most relevant when it applied directly to her classroom teaching.

> I guess it's because, "Oh I can use that in my classroom. That's a great idea. I'm going to write that down and I can start using that right away." Some of them, again I'm just thinking of convention and the PD opportunities there. Some of them are the happy-go-lucky feel good about yourself sessions, which are good because you need that too. And some are the meat and potatoes, this is what you can do to teach this strategy, this is what you can do to teach this outcome. And when you have things like that it makes you go, "Ah-ha, I hadn't thought of that." It just makes it easier.

She later confirmed her belief in the importance of connecting her PD to practice. When asked what makes PD effective and meaningful, she focused on the connection to her own practice in the classroom.

> I guess different things. Whether or not it makes your teaching job easier by, "This is a great technique in order to teach this outcome." Or it makes your life easier as in, "This is a good planning strategy on how to plan to make sure that you're encompassing all of these outcomes."

Similarly, when asked to talk about a time in which PD was not effective or meaningful, one teacher expressed her frustration that the learning was not linked to her own practice.

> We got [sic] some theory and sort of PowerPoint presentations on why we do PD. And, you know, we just kind of sat there for a while. And that was really frustrating for me. I wanted to see us get going on it, you know. Like everything that we believe, let's do something about it. Let's get going on it.... We can't just sit and say, "PD is good, we need PD. We want to be professional. We need to learn. We need to do this so the kids are better." Okay, I agree with that. So what's our plan to make that happen?

In talking about the school level PD time, another teacher indicated that effective PD was structured so that teachers could get something useful to use in the classroom, denoting a significance to applying what was learned in PD time outside of the classroom to practice in the classroom: "but then it's just having that time to make use and practice." Later, this teacher elaborated,

> well, I think you have to try and make an effort to learn something that, hopefully that's something that you can concretely apply to your classroom, but if not at least maybe it's something that's given you kind of a nudge to think of something in a different way. Like the assessment thing, you know I didn't really get the idea of it, but then after you think that, "Well maybe there are things that I could be assessing differently or better?"

One theme that emerged from the teachers' discussions on professional development was their interest in connecting the professional development activities with their classroom practice. There was a particular emphasis on how the work on collaborative groups contributed to dealing with problems of practice. In particular, the teachers showed interest in the area of assessment, thereby reflecting the provincial move towards teachers' accountability in terms of student performance and achievement. In fact, one teacher talked about the professional development initiative in terms of the goals of reform, "it just seems like we're being held more accountable now, that 'Yeah we want to see some results and we want to see it in the classroom'."

Regarding the production of professional knowledge, the teachers' responses suggested that the production of professional knowledge in schools is a complex and multifaceted process that involves the interaction of different scenarios in which the teachers' professional practice unfolds. As we indicated previously in this article, the provincial policy documents (Alberta Education, 2003; 2006; McEwen, 2006) suggest specific directions regarding the structure and functioning of professional development initiatives in schools, such as the implementation of professional learning communities (Alberta Education, 2003).

There is a marked focus on connecting teacher professional learning and school reform, both in the policy documents and in the teachers' reflections. One consequence of reading professional learning communities within the framework of school reform is that such an interpretation seems to lead to the conclusion that teachers are the subjects of reform because the professional learning community model focused on transforming the teaching practices in order to attain the overarching goal of student achievement (Wood, 2007). Teaching practices are conceptualized as problematic and collaborative learning initiatives are presented as the solution. Furthermore, as we will show in the next section, the policy discourse positions teacher learning in communities as instrumental in producing knowledge to change practices. Indeed, according to common formulations of professional learning communities, student achievement is portrayed as influenced by effective instructional methods; therefore, it is implied, improving instruction through collaborative initiatives becomes the means to the goal of reform, namely student achievement. Yet, such conceptualizations leave us with questions about the "what" of teacher learning and knowledge. That is, what is teacher learning and what is teacher knowledge in the context of schools? We want to call attention to the treatment of the concept of professional knowledge within the literature on professional

learning communities. We argue that the scholarship on professional development and particularly the literature on professional learning communities would benefit from interrogating the development of professional knowledge in schools. We want to question the connections and also the disconnections between professional learning and professional practice in order to argue that the notion of *enactment* provides an integrative framework to study professional knowledge in schools.

THE SCENARIOS OF CLASSROOM PRACTICE AND THE SCENARIOS OF TEACHER LEARNING

One theme that emerged from the teachers' testimonies was an apparent conceptual separation between the scenarios of professional development and the spaces of classroom practices. This was evidenced in the teachers' talk about the effect that some professional development initiatives have had in their classroom practices and particularly on their discussion about how their work in collaborative groups was reflected in their classroom practices. This seemed to suggest that the scenarios of professional learning, in which the teachers' professional knowledge was created, were perceived as disjointed from the scenarios in which their professional knowledge was being translated into practice. The events of professional learning and the events of professional practice are apparently conceived as separated in the teachers' description of the development of their professional knowledge.

The particular way teachers talked about professional development suggests that the opportunities for professional development materialized outside the classroom space. Teachers saw their professional knowledge as transformed within the space of collaborative groups, and they reported that they brought this knowledge to the classroom in order to attain certain instructional goals. In this view, the classroom seems to be perceived as a scenario for professional practice that is influenced by the knowledge originated in the context of collaborative groups. One teacher was explicit in this regard when she indicated that PD was meaningful to her "because I came back and I could use it the next day. It wasn't something that I had to figure out, 'Where am I going to put this?'"

Some teachers also suggested that there are opportunities for developing professional knowledge outside the space of collaborative groups. They carried on professional development initiatives on their own and applied their knowledge to their classroom needs. One teacher, in talking about individual PD time, envisioned a connection to classroom practice. This teacher dedicated the individual PD time to technology, looking for materials and programs that could be used to enhance teaching skills in the classroom.

> ...I can apply it to a lesson that I can use for the kids that I think can be beneficial, they're going to learn something here today or this might help

> with reading comprehension or maybe this will pique their interest a little bit just to change things up sometimes.

Similar to the collaborative group situation, the teachers who worked on individual projects described the context of professional practice and the context of professional learning as separated in time and space. The action of teaching in the classroom was not described in terms of a learning opportunity for the teachers but in terms of an opportunity to put in practice the knowledge generated through their individual projects of professional development.

A PROPOSAL: PROFESSIONAL KNOWLEDGE AS ENACTMENT

According to Fenwick and Edwards (2010), knowing is a situated, embodied, and distributed process "brought forth and made visible through circulations and connections among things" (p. 24). Knowing is not static or episodic; it is not a psychological object picked up by the individual who represents the world in her inner mind. Knowing is a situated process influenced by material and discursive contexts; it is also embodied because what we know depends on the characteristics of our bodies and the way our bodies relate with artefacts. Knowing is a distributed process because objects and other people exert influence and mediate the knowing process. Fenwick and Edwards indicated that, "classroom learning activities, for example, can be traced to appreciate the knowing practices that emerge through heterogeneous combinations of discursive and material things with various relations and joint actions" (p. 25).

According to Latour (2005), persons, objects, knowledge, and locations are included as relational effects. For example, Fenwick and Edwards (2010) have showed how the teacher is not a distinct actor who "pre-exists." Rather, her "teacheriness," or the teacher's particular being, is produced in the "materially heterogeneous relations of activities in which she is involved and engaged" (Fenwick & Edwards, 2010, p. 17), including her interactions with the other actors in the classroom (i.e. teaching materials; configurations of desks and walls; bells to indicate subject and activity change; students, parents, administrators, university instructors; and curriculum documents to name a few). Fenwick and Edwards (2010) summarized this idea, saying, "nothing is given in the order of things, but all performs itself into practice" (p. 11), meaning actors only become actors in the context of practice, and there is no essential attribute for something or someone to become an actor.

The study of learning as an activity situated in institutional contexts is not new; Lave and Wenger (1991) introduced the concept of *legitimate peripheral participation* to explain how learning takes place in the context of communities of practice. In their view, learning is not just a located mental process inside the individual's head; instead, learning is situated in the contexts in which individuals participate collaboratively. This evidently implies a change of focus

because their question is not what kind of *cognitive processes* are involved in learning, but what kind of *social practices* can be characterized as learning.

The idea of community of practice has been explored in the field of professional development and policy enactment (Wenger, McDermott, & Snyder, 2002). For example, Coburn and Stein (2006) used this concept to study how a community of practitioners put a particular instructional policy in practice. These authors indicated that the fact that practitioners had their own learning dynamics in their communities had an impact in the way the policy was enacted in the classroom. Communities are *emergent* rather than *designed* and the understanding of the policy is mediated by the institutionalized practices in particular communities. Coburn and Stein suggested that policy makers must "design policy for participation rather that for use" (p. 43) because communities play a more active role than just passive receivers of policy documents.

Lave and Wenger's work substantiates the claim that what is known is known in the context of a practice. This principle is taken one step further by Latour (2005) who argued that the interaction between human beings and artefacts generate the conditions for action. In a similar fashion, Weick (2003) argued that when people act, they structure their own environment, and the environment so structured constrains people's actions. Also, Maturana and Varela (1992) used the concept of *enactment* to indicate that human beings among other biological entities continuously generate the conditions for their own action by *enacting* an environment. As biological organisms, human beings adapt to the environment by operating in the environment and adapting it to their needs. Yet, the conditions for this adaptation are at the same time constrained by some features in the environment. So according to Maturana and Varela, an organism's capacity to know the world depends on the organism's capacity to act in the world. The interaction between an organism and its environment is the mechanism by which both the environment and the organism change.

Bringing these ideas to the case in point, it can be said that teachers come to learn about their profession by enacting an environment in which they can make sense of their professional knowledge. This means that the classroom as a context of professional practice provides meaningful opportunities for learning in action. Teachers' professional knowledge is enacted through their actions in the classroom.

We believe that a key element in the transformation of professional practices is the teachers' awareness that their professional knowledge is enacted through their actions and practices. This does not reject collaborative practices out of hand; in fact, we suggest that teachers learn about their profession by acting in multiple contexts such as formal / informal interactions with students and colleagues (Boud & Middleton, 2003; Schugurensky, 2000), interactions with objects (such as curriculum documents, reading materials aimed at teacher

improvement, or professional growth plans) (Fenwick & Edwards, 2010), or by personal reflection and discovery. The idea that teachers enact an environment in order to generate knowledge about their own practices provides a novel way to reconnect teacher learning and classroom practices.

Our analysis aims to make sense of the idea that collaborative groups build teacher capacity. We add to this picture an analysis of professional development initiatives that shows that there is a continuum between the classroom context and the context of collaborative groups. Consequently, we see teacher learning as a process that spans in time and space in the scenarios of teacher discussion and also in the scenarios of classroom practice. Teachers learn about their profession when they enact scenarios of practice in their classrooms, but also when they discuss their experiences with peer teachers in collaborative settings. We do not see a sound reason to assume that teacher learning starts or ends at some point within the continuum of classroom practices and collaborative groups of teachers.

We argue that teachers do not import knowledge to the classroom. Furthermore, we see the scenarios of dialogue, collaboration, and classroom practice as an assemblage (Latour, 2005) in which learning takes place as teachers and knowledge circulate within the assemblage. For example, analyses that draw upon Actor-Network Theory suggest that knowledge is generated as the teacher interacts with her students, with curriculum documents, with computers, with teaching materials, with her classroom as a teaching and learning environment, and with other people including colleagues, parents, and administrators. Fenwick and Edwards (2010) noted that Actor-Network Theory "helps us to unpick practices, processes and precepts to trace how things come to be" (p. 12). That is, the daily forms of knowledge that are circulated and enacted are important to teacher learning. As new policies on school reform based on teacher collaboration are introduced, it is imperative to pay attention to the connections among the teacher, the students, and the objects in the classroom. It is in these connections where knowledge is produced and can be traced. Current models of professional learning in communities would benefit from exploring what teachers' knowledge is and how it is connected to classroom practices.

REFERENCES

Alberta Commission on Learning. (2003). *Every child learns, every child succeeds.* Edmonton, AB: Author.

Alberta Education. (2003). *Accountability in education: Teacher growth, supervision and evaluation.* Edmonton, AB: Author.

Alberta Education. (2006). *Professional learning communities: An exploration.* Edmonton, AB: Author.

Boud, D., & Middleton, H. (2003). Learning from others at work: Communities of practice and informal learning. *The Journal of Workplace Learning, 15*(5), 194-202.

Chambers, D. (2008). *District review report: School District No. 39 (Vancouver).* Victoria, BC: Ministry of Education.

Clandinin, D. J., & Connelly, F. M. (1995). *Teachers' professional knowledge landscapes*. New York, NY: Teachers College Press

Coburn, C., & Stein, M. (2006). Communities of practice theory and the role of teachers' professional community in policy implementation. In M. Honig (Ed.), *New directions in education policy implementation: Confronting complexity* (pp. 65-82). Albany, NY: SUNY Press.

Cochran-Smith, M., & Lytle, S. L. (1993). *Inside/outside: Teacher research and knowledge*. New York, NY: Teachers College Press

Cochran-Smith, M., & Lytle, S. L. (1999). Relationships of Knowledge and Practice: Teacher Learning in Communities. *Review of Research in Education,* 24(1) 249-305.

Connelly, F. M., & Clandinin, D. J. (1999). *Shaping a professional identity: Stories of educational practice*. New York, NY: Teachers College Press

DuFour, R. (2004). What is a "Professional Learning Community"? Three big ideas guide this school reform effort: Commitment to student learning, a culture of collaboration, and a focus on results. *Educational Leadership 61*(8), 6-11.

DuFour, R., DuFour, R. B., & Eaker, R. E. (2008). *Revisiting professional learning communities at work: New insights for improving schools*. Bloomington, IN: Solution Tree.

Fenwick, T. J. (2010). (Un)doing standards in education with actor-network theory. *Journal of Education Policy, 25*(2), 117-133.

Fenwick, T. J., & Edwards, R. (2010). *Actor-network theory in education*. New York, NY: Routledge.

Government of Newfoundland and Labrador. (2008). *Building learning communities: A handbook for school councils*. St. John's, NL: Author.

Hord, S. (1997). *Professional learning communities: Communities of continuous inquiry and improvement.* Austin, TX: Southwest Educational Development Laboratory.

Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory*. Oxford, UK: Oxford University Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.

MacKay, A.W. (2007). *Connecting Care and Challenge: Tapping Our Human Potential.* Fredericton, NB: Department of Education. Retrieved from http://www.gnb.ca/0000/publications/mackay/Summary%20Document%20MacKay%20Report.pdf

Maturana, H. & Varela, F. (1992). *The tree of knowledge: The biological roots of human understanding* (Revised Ed.). Boston MA: Shamabala.

McEwen, N. (2006). *Improving schools: Investing in our future*. Edmonton, AB: Alberta Education.

Nespor, J. (2002). Networks and contexts of reform. *Journal of Educational Change, 3*(3-4), 365-282.

Ontario Ministry of Education. (2007). *Professional learning communities: A model for Ontario schools* (Secretariat: Special Edition #3). Toronto, ON: Author. Retrieved from: http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/PLC.pdf

Parsons, J. (2011, June). Eleven years of teacher action research: How AISI affects education. *ATA Magazine,* 4(91). Retrieved from http://www.teachers.ab.ca/Publications/ATA%20Magazine/Volume-91/Number-4/Pages/Eleven-years-of-teacher-action.aspx

Reitzug, U. C. (2002). Professional development. In A. Molnar (Ed.) *School reform proposals: The research evidence.* Greenwich, CT: Information Age Publishing.

Rubadeau, R. (2007). *District review report: School District No. 91 (Nechako Lakes).* Victoria, BC: Ministry of Education.

Saskatchewan Ministry of Education. (2007). *Saskatchewan Learning assessment for learning program: Supporting data-guided decision-making to improve student learning.* Regina, SK: Author.

Saskatchewan Ministry of Education. (2008). *A time for significant leadership: A strategy for implementing First Nations and Métis education goals.* Regina, SK: Author. Retrieved from http://www.education.gov.sk.ca/ATFSL

Schugurensky D (2000) The forms of informal learning: towards a conceptualization of the field. *NALL Working Paper, 19*. Retrieved from https://tspace.library.utoronto.ca/bitstream/1807/2733/2/19formsofinformal.pdf

Stoll, L., & Louise, K. S. (2007). *Professional learning communities: Divergence, depth and dilemmas*. Maidenhead, UK: McGraw-Hill/Open University Press.

Stoll, L., Bolam, R., McMahon, A., Wallace, M., & Thomas, S. (2006). Professional Learning Communities: A review of the literature. *Journal of Educational Change, 7*(4) 221-258.

Viczko, M. (2009). *A comparative case study of teacher professional learning in Alberta and England* (Master's Thesis). Retrieved from: http://hdl.handle.net/10048/482

Weick, K. E. (2003). Enacting an environment: The infrastructure of organizing. In R. Westwood and S. Clegg (eds.), *Debating organization* (pp. 184-194). Oxford, UK: Blackwell.

Wenger, E., McDermott, R., & Snyder, W. M. (2002). *Cultivating communities of practice: A guide to managing knowledge*. Boston, MA: Harvard Business School.

Williams, R., Brien, K., Sprague, C., & Sullivan, G. (2008). Professional learning communities: Developing a school-level readiness instrument. *Canadian Journal of Educational Administration and Policy, 74*, 1-17.

Wood, D. (2007). Teachers' learning communities: Catalyst for change or a new infrastructure for the status quo? *Teachers College Record, 109*(3), 699-739.

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TEACHER PROFESSIONAL LEARNING IN PURSUIT OF THE COMMON GOOD: A DISCUSSION OF THE ROLE OF DEMONSTRATION SCHOOLS IN TEACHER EDUCATION

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ABSTRACT. The Federal Government in Australia has recently established Centres for Excellence in Teacher Education. These Centres represent a power shift towards schools in teacher education and away from centralised bureaucracies and university faculties of education. Given this shift, it is interesting to examine other historical and current school-based models of teacher education, specifically demonstration schools in the United Kingdom, United States, and Australia and professional development schools in the United States. This paper discusses both models with a detailed case study of the operation of one demonstration school in Sydney, Australia. The discussion and case study reinforces the lessons of the historical models that initiatives in this area need long-term support so that they can develop the momentum necessary to achieve the long-term cultural change required.

LA FORMATION PROFESSIONNELLE DES ENSEIGNANTS COMME RECHERCHE DU BIEN COMMUN : DISCUSSION DU RÔLE DES ÉCOLES DE STAGES DANS LA FORMATION DES ENSEIGNANTS

RÉSUMÉ. Le gouvernement fédéral de l'Australie a récemment mis sur pied des Centres d'excellence en formation des enseignants. Ces centres représentent un transfert de pouvoirs dans le domaine de la formation des enseignants, des bureaucraties centralisées et facultés universitaires vers les écoles. En regard de ce changement, il est intéressant de faire l'examen d'autres modèles de formation des enseignants en milieu scolaire. Historiques ou actuels, les modèles étudiés sont les écoles de stages d'Angleterre, des États-Unis et de l'Australie ainsi que les écoles de développement professionnel américaines. Cet article présente les deux modèles ainsi qu'une étude de cas détaillée sur les opérations d'une école de stages située à Sydney en Australie. La présentation des deux modèles et l'étude de cas supportent les leçons tirées des modèles historiques. En effet, ceux-ci soutiennent que les initiatives dans ce domaine requièrent un support à long terme pour développer le dynamisme nécessaire à la concrétisation des changements culturels requis à long terme.

The Federal Government in Australia has recently established policy control of teacher professional learning through targeting funding tied to the National Partnership Agreement on Improvement of Teacher Quality (Council of Australian Governments, 2009). The warrant underpinning the pursuit of Teacher Quality emanates from the paradigm of evidence-based research with their foundational premise that it is the teacher that makes the biggest difference to student outcomes (Rowe, 2003). The new policy also acknowledges that educational reform at the whole-school level is important. The Federal Government has signalled this through the establishment of Centres for Excellence in schools that have demonstrated evidence of quality teaching and learning in recent years. These "hub" schools are given extra funding for two years and charged with the responsibility of driving professional learning in a network involving three to five other schools.

Each of the Centres for Excellence has a Highly Accomplished Teacher (HAT) who leads the professional learning initiatives for both pre-service and in-service teachers in the network. Included in their role description is the task of liaising with partner universities who are involved in pre-service teacher education. Historically, the universities have been responsible for liaising with schools for professional experience placements whilst centralised Departments of Education have been responsible for the professional learning of in-service teachers. This shift of power in pre-service teacher education and professional learning to schools signals an important shift in policy for the Federal Government in Australia. This echoes other historical models of school-based teacher education and professional learning including the demonstration school model.

Demonstration schools have existed in various guises since the late 18th century (Edwards, 1991). The most common term in Europe, Asia, the US and Latin America used for schools where teacher training occurs is normal school. The first 'ecole normale' was established in France in 1794 by a decision from the National Convention "to create in Paris an *école normale* where citizens of the Republic already instructed in the useful sciences should be taught to teach" (Edwards, 1991, p. 239). In contrast, demonstration schools are a relatively unknown and unrecorded British historical phenomena as "the term 'normal school' never attained the same degree of popularity in Britain as it did in France and the United States" (Edwards, 1991, p. 243). It seems that by sole virtue of its British history, demonstration schools still exist today in Sydney, Australia. In more recent decades, professional development schools have been one of the more prominent expressions of school-university partnerships in the USA. All of these partnerships mentioned here have had a focus on pre-service and in-service teacher education.

This article discusses the role of demonstration schools and professional development schools in teacher education and professional learning before presenting a case study of one demonstration school that has been operating

in Sydney, Australia for 36 years. The purpose of this discussion and case study is to distill the lessons learnt from these historical models and offer them as a counterpoint to current developments in Australia as represented by the Centres for Excellence. The conclusions offered relate to the pedagogy and governance of school-based initiatives in teacher education and professional learning.

THE HISTORICAL ROLE OF DEMONSTRATION SCHOOLS

This discussion of demonstration schools commences with the literature published during the heyday of the demonstration school experiment in England during the period 1890-1926. It then moves on to examine another brief appearance of demonstration schools in the American education research literature in the period 1925-1950. Finally, the discussion examines the operation of another school-based model of teacher education in the professional development schools in the US.

The demonstration appellation can be misleading as the intention of the originators of the Fielden demonstration school in England in the early 1900s was not to create a school where the "demonstration of approximately perfect methods are exhibited for the instruction of students by approximately perfect teachers" (excerpt from HMI Report of Inspection 17 November 1908 cited in A. Robertson, 1992, p.375). Professor Findlay of Victoria University at Manchester created the most extensive written record of the demonstration school experiment in England during the period 1890-1926. Professor Findlay was interested in student teachers' learning through practice; "when he talked of 'laboratory,' Findlay was thinking of the context of learning and discovery in an open-minded and collaborative way, rather than of experimental method in a scientific sense" (A. Robertson, 1992, p. 365). This sense of a collective enterprise for the common good is reflected in the diaspora of demonstration schools that are reported in the literature.

Historians of education have applied the term "experiment" to the English period, as it seems Findlay's Fielden demonstration school operated outside of the operational parameters of both the Department of Education and the university. Both institutions were unsure of where the demonstration school aligned with their respective visions for teacher education. The Department of Education was interested in meeting regulations and minimum requirements for trainee teachers whilst universities were keen to promote the fledgling field of education research. Inevitably, there was a tension between the two aims, a tension that persists to the present day. Findlay established the demonstration school partly as a response to what he saw as the failings of both models of teacher education:

> He recognised that although the universities trained teachers, they were in reality the agents of central government. This had unsatisfactory side effects in that government wanted close adherence to narrow regulations, an output

> it could measure and most ominous of all from the University perspective, showed no interest in educational research. (A. Robertson, 1992, p. 370)

Findlay was a strong critic of both the school-based apprenticeship model as well as the university-based model with its emphasis on the theoretical foundations of education. To paraphrase Britzman's title of her seminal text on teacher identity (Britzman, 2003), Findlay argued that practice just makes practice unless there is a serious effort on the part of the practitioner to interrogate this practice. At the same time, Findlay rallied against the theory-before-practice model popular in universities. This is not to suggest Findlay was opposed to theory (A. Robertson, 1992).

Findlay regarded the demonstration school as a site where the student-teacher could study educational theory through the observation and critical reflection of practice, both their own and other teachers'. In reality, demonstration was not the most accurate title for the type of discursive professional learning activities that Findlay and his colleagues conducted at Fielden. The emphasis was on the reasoned discussion of practice rather than a mere one-off demonstration by the demonstrator or student-teacher. As Findlay described it, "evaluation of teaching should derive from 'free debate' between student, lecturer, demonstrator and class teacher" (A. Robertson, 1992, p. 363).

Findlay's notion and practice of a demonstration school could be read as being an example of a community of practice established around the practice of teaching. This community of practice included the student teacher, classroom teacher and university teacher educator. The relaxation of the status divisions that separated these three practitioners was a major achievement of Findlay's model. This provided the foundation for productive learning discussions on pedagogy. These discussions were founded on Findlay's belief that the demonstration school was the most appropriate site to bring the art (practice) of teaching together with the science (theory) of teaching. This account of Findlay's contribution is supported by Robinson (2004): "A demonstration school provided space and time for reflection, discussion and debate about pedagogy and also opened up numerous possibilities for curriculum innovation, research into child development and experimentation" (p. 86). Robinson also provides an explanation for the demise of the demonstration school experiment in England in 1926: "contested control, inadequate funding and conflicting interests made the practical actualization of the ideal virtually impossible" (p. 86). As the experiment waned in England, it waxed in the US.

Demonstration schools in the US

There are three articles from the period 1925-1950 that specifically focus on the role of demonstration schools in the US, mainly in relation to their use as centres for in-service education for teachers. This may be due to the presence of normal schools and teacher colleges that were set up for that purpose. The

demonstration schools referred to in the papers reviewed are from the diverse geographical locations of Seattle, New Jersey, and Baton Rouge.

The representation of demonstration schools in the articles from the US do not allude to any role they had with pre-service teachers. This indicates that there were no relationships established with universities. In common with the English model, however, there is a debate on the worth of demonstration as a strategy for professional learning. In this sense, the two papers from the 1920s referring to the Trenton and Seattle demonstration schools offer enthusiastic support whilst the 1950s paper is a little more critical of this professional-learning model.

Both the Trenton and Seattle demonstration schools were described as sites where in-service training occurred with teaching methods that were approved by the respective departments of education. There was a definite move away from the in-school trial of experimental methods signalled in both papers, here exemplified in West's (1925) writing on Trenton:

> It was made clear from the start that this school was being organized not as an experimental school in which new ideas would be tried out but as a demonstration school in which could be found the methods and technique advocated in the courses of study and by the school official. (p. 623)

The demonstration schools in the US were established as instruments of the state, "attempting to exemplify through classroom work methods and procedures that receive the approval of the administration" (Smith, 1928, p. 268). West set out five advantages of the demonstration school model for teacher professional learning:

> 1. It provides an organized situation in which are being worked out the methods and policies of the school system.
> 2. It concentrates in one building the most effective teaching being done in the school system.
> 3. It gives to the visiting teachers an opportunity to see good technique and organization throughout an entire school.
> 4. It provides the basis for a discussion of classroom practices between teachers, principals, and supervisors.
> 5. It sets up in the school system a definite standard toward which all of the teachers may aim. (West, 1925, p. 626)

Smith (1928) reported that teachers enjoyed demonstration lessons under real conditions, preferring them over teacher meetings for the purposes of professional learning. In a survey of 100 hundred visitors to the Summit Demonstration School, Smith found that 61% of respondents believed that it was "much easier to evaluate educational principles and technique of classroom procedures when they are witnessed in a working situation than when they are merely discussed or read" (Smith, 1928, p. 271). So it is seems from these accounts that the primary method for professional learning was for local and visiting teachers to observe a demonstration lesson given by another teacher.

These demonstration lessons then set the standard for the district to aspire to, another clear indication of the instrumentality of the demonstration school in this model.

It is in the discursive practices of the teachers in the US demonstration schools that we see a similarity to the UK model. Smith (1928) described the importance of the post-lesson conferences where the visitors and the demonstration teacher could engage in critical dialogue; "opportunity for criticisms and suggestions must be given visitors through the conference periods following the demonstration" (Smith, 1928, p. 272). This echoes Findlay's argument on the importance of establishing a dialogue that surpasses the one-off inspection of a lesson: "All criticism lessons and lessons before inspectors, prepared on the understanding that the period so taken is a complete and finished affair, are to be condemned" (Findlay, 1913, as cited in A. Robertson, 1992, p. 363).

After one-year of operation of the Trenton demonstration school, West (1925) confidently predicted that "the demonstration school will prove to be the foundation of the training in service which can be carried on in our school system" (pp. 624 - 625). From a review of the historical record, it is not possible to provide a warrant for this claim. However, it is also quite conceivable that a model that was so embedded in the school system might not appear in the education research literature emanating from the academy. Demonstration schools do not appear in the record until 1950, when J. B. Robertson offered a critique of the operation of demonstration schools in Baton Rouge, Louisiana. His critique centred around what he regarded as the use of the demonstration school as a panacea for all under-performing teachers (J. B. Robertson, 1950). Robertson claimed that the demonstration lesson was overly focused on teaching techniques rather than on the broader purposes of teaching. To overcome this, he suggested that equal time be granted to the orientation and group planning processes, as "it would give the person who is to do the demonstration teaching an opportunity to share the thinking of the persons who are to observe" (J. B. Robertson, 1950, p. 236).

This emphasis on collective discussion about teaching practices is a clear theme in the genealogy of demonstration schools. Whilst there seems to be a consensus on the pedagogy of professional learning employed in demonstration schools, their political role in teacher education is up for debate. Professor Findlay at Fielden established a model of teacher education that philosophically and logistically was positioned outside both the state and university, whereas the US demonstration schools were established to play a key role as professional development schools within the state system of education. More recently a teacher educator in the UK cited the demonstration school model to support contemporary shifts towards more school-based teacher education in the UK. Robinson asserts that "it might be more helpful to rethink the recent shift towards school-based training as part of a much longer historical and professional

tradition of the teacher as trainer" (2006, p. 27). In another text, Robinson argued that initial teacher training schools in the UK introduced in 2000 and 2001 might be more able to realise the demonstration school ideal given the certainty of centralised funding as well as the technological affordances available in the current time (Robinson, 2004).

Robinson's work in this area is helpful as it draws attention to the political investments of the stakeholders that have been involved in the debate over the operation of demonstration schools. Political investments from the Universities have been a key driver in the formation of another school-based initiative in teacher education, that of professional development schools in the US.

Professional development school

The Holmes Group, a consortium of large US universities offering teacher education courses, established professional development schools (PDS) in the USA in the mid 1980s. PDS share many goals in common with the original demonstration schools in that they focus on professional learning for both pre-service and in-service teachers. This professional learning is a democratic dialogue of inquiry with equal input from school and university-based teacher educators. There have been many articles published in this journal that point to the successful features of the PDS. These include the collaboration and community established among teachers, the shift to uncertainty attendant with the culture of inquiry, and the benefits of mentoring pre-service teachers.

Collaboration between teachers in a professional learning community is claimed to be one of the benefits of PDS. Snow-Gerono (2005), in her research on a PDS collaborative "between a north-eastern university and four elementary schools" (p. 243) identified a clear shift to community among the teachers in her study in contrast to the professional isolation that she regarded as problematic. In a similar vein during the previous decade, Bullough, Kauchak, Crow, Hobbs and Stokes (1997) found that a professional learning co-operative program resulted in improved professional learning for teachers. They hypothesised the reasons for the effectiveness of the Co-op program as being "the length (over two years) and intensity of the program, shared communal cohort experience, continuity among Co-op leaders, academic rigor, the applied nature of the course work, and opportunities to do systematic school-based research" (Bullough et al., 1997, p. 162). It must be acknowledged here that the authors also noted the "consistent and persistent hard work involved" (Bullough et al., 1997, p. 165) for all parties to create a shared vision that allow these outcomes to happen.

The promotion of a culture of inquiry in PDS means that a shared vision can also involve a productive dissensus, Snow-Gerano (2005) has argued. In this conceptualization, teachers are empowered to question their own practices, curriculum mandates, and school policies. Dissensus requires a scholarly humility and voice that has not always been associated with teachers working

in structured hierarchies. It would seem that such a shift to uncertainty on the part of teachers, as posited by Snow-Geronomo, reflects the type of professional learning culture enabled by PDS, which Sandholtz (2002) identified in her study as rated most valuable by teachers. The induction of pre-service teachers into a like culture of inquiry is also regarded as an important outcome of PDS.

Mentoring a pre-service teacher is regarded as being a useful act of professional learning. Reflective practice is promoted when teachers need to explain their practice to others (Bullough et al., 1997; Sandholtz, 2002). When this reflective practice takes place in a professional culture of inquiry in PDS, then the benefits are magnified for both teachers and pre-service teachers (Mule, 2006; Snow-Gerono, 2005). Both Mule and Snow-Gerono point to the importance of establishing a future generation of teachers accustomed to working in an open culture of inquiry. However, Mule (2006) regards this transition as being problematic: "participating in an inquiry while at the same time dealing with the challenges of teaching as a novice teacher can be stressful and overwhelming to interns" (Mule, 2006, p. 214). Bullough et al. (1997) also regard the establishment of PDS in challenging school communities that have the most disadvantaged students as posing troubling ethical and pedagogical questions. The ethical question centres on students being taught by the most inexperienced beginning teachers, and the pedagogical issue on the limited opportunity for interns to develop their skills when they are challenged on many other fronts, such as classroom management, planning, and the completion of university assignments (Bullough et al., 1997).

In summary, the PDS project in the US has provided a rigorous body of research that supports the establishment of robust school-university partnerships. These partnerships create and sustain collaborative communities of practice that support teacher professional learning for interns as well as veteran teachers. In common with the demonstration school movement, the PDS involves a realignment of existing resources and stakeholders. The question of resources becomes an important factor when government budgets for education are contracting rather than expanding. A model supported by a robust research base such as the PDS project is therefore important for teacher educator reformers in other countries who wish to create or sustain school-university partnerships. One such partnership is the focus of the next section of this paper.

CASE STUDY: NORTH SYDNEY DEMONSTRATION SCHOOL

Australian teacher education for its first 100 years was characterised, at the primary level in particular, by close relations between teachers' colleges and schools. These relationships were boosted by the establishment of "training schools." In Sydney, the Sydney Teachers College was formed in 1906 and moved onto the campus of the University of Sydney in 1920.

The move of the Sydney Teachers College to the University seemed to indicate a political shift in Sydney in the control of teacher education from schools to the university. However, the Faculty of Education and the Teachers College remained separate entities until the 1990s. This separation is still reflected in the structure of the Bachelor of Education courses today, which are comprised of the three strands of Education Studies, Curriculum, and Professional Experience.

The demarcation between professional education and the intellectual study of education was similarly maintained throughout Australia where teacher training was carried out in purpose-built teachers' colleges. These teacher colleges maintained good relations with selected local schools for the purposes of demonstration lessons. These schools were given the designation of demonstration schools by their state jurisdiction. In this aspect, they resembled the instrumentalist model of demonstration schools evident in the United States in the mid 1900s, where the state sought to exert some control over the conduct of teacher education. However, one of these demonstration schools in North Sydney was established in accord with the English tradition to the extent of the adoption of the model of governance. This is evident in the wider scope of its operations, which has gone beyond the presentation of demonstration lessons to visiting teachers and pre-service teachers.

North Sydney Demonstration School (NSDS) was established in accordance with an agreement between the Director General of Education and the Vice Chancellor of the University of Sydney. The Agreement commenced operation in 1975 and its most recent revision was in 1992. The original agreement between NSDS and the University of Sydney defined eight areas of co-operating interest: student practice teaching; microteaching; systematic observation; research and development on teaching, learning and curriculum; co-operative staffing and shared resources; in-service education activities; communication and dissemination; and exploration of school-university cooperation (University of Sydney & New South Wales [NSW] Department of Education, 1975).

Another clear reminder of English influence was the establishment of an Advisory Committee to oversee and guide the operation of the NSDS. This Advisory Committee, remarkably similar in composition to the one convened over 100 years ago at Fielden, is responsible for overseeing the joint program in teaching and research between the School and University. It meets a minimum of four times per year to discuss and approve details of proposals and monitor the ongoing effectiveness of the partnership. In its ideal incarnation, it is a forum for the exchange of ideas amongthe four key stakeholders in the school: the NSW Department of Education, the University, the school, and its parent representatives.

The Advisory Committee filed annual reports, and an article was published on the NSDS (Jensen & Bee, 1981) in the School and Community News. The Jensen and Bee article describes a school that is more experimental than

instrumental and more like Fielden in England than the US demonstration schools. The article featured school-based curriculum development, an open school policy for parents to visit anytime, pedagogical research, and freedom for teachers to choose the composition and philosophical approach of their class. The aims and objectives of teachers' particular philosophical approaches had to be explained in a letter to the parents and justified to the Advisory Committee. This freedom for teachers and the access given to parents to classrooms is emblematic of the experimental aspect of the demonstration school.

Jensen and Bee (1981) described a school in which all community members, aside from the students, had genuine influence over important decisions in the school. The key intellectual exchange in the demonstration school today is between the teachers and teacher-educators. This professional learning exchange between teachers and teacher-educators is a settlement that is far from the utopia inscribed in the partnership agreement but is nevertheless regarded as an achievement in a political climate in which the work of teachers and teacher educators on the whole has become increasingly bound by the dictates of state policy rather than democratic professionalism (Connell, 2009).

As recompense for additional duties and expertise, teaching staff at the school were (and are) paid an additional "demonstration" allowance by the University. This "demonstration loading" is an interesting aspect of the partnership especially in the light of the current Federal Government's funding of school-based Centres for Excellence in professional learning, in which significant new funding is tied to professional learning and student outcomes. Part of this funding is a type of demonstration loading paid to a "Highly Accomplished Teacher" in the school who will be the conduit for a professional learning exchange with a local teacher education faculty and the other schools involved. It appears that the professional learning collective is favoured over individual acknowledgement in which everyone (rather than just one teacher) is paid an allowance.

One of the key principles and points of tension in the governance of the University of Sydney-NSDS partnership is teacher selection. The University has a voice on merit selection panels that decide on the particular quality of teacher that will sustain and develop the partnership. The right of the university for representation on selection panels was debated strongly in 1985 with the University having to contest its right to participate on selection panels. One voice in a panel of four does not seem like a large political concession for the NSW Department of Education and Training to make. However, it is important given the tight controls that the NSW Department of Education and Training and the teacher's union has exerted on the selection and promotion of teachers in the state of NSW for 150 years. This has meant that many of the vacant positions for classroom teachers have been filled by a merit selection process rather than through internal transfer or through selection by the staffing

system. As well, the presence of the university-based teacher educator on the interview panels has resulted in professional learning being a key criterion for selection of teachers.

At NSDS, the existence of the Advisory Committee, the demonstration award, and the presence of faculty from the University of Sydney on staff selection panels have created an overarching ethos of partnership that distributes the responsibility for the partnership beyond the Principal/Executive and ensures a legitimacy for access to the University of Sydney for all staff. The presence and specificity of the agreement provides a shared framework that reduces the needs of either teachers or lecturers to defend the importance and integrity of their respective professional knowledge and practices.

LESSONS FROM THE DEMONSTRATION SCHOOL MODEL

Contemporary reforms in school-based teacher education and professional learning should recognize the historical models that have come before it. The demonstration schools and PDS are models of school-based teacher education that have an important contribution to make to the development of contemporary initiatives in school-university partnerships in terms of pedagogy and governance. Both models emphasise the collective good over the individual and are part of the practice architectures that contribute to partnerships that work towards a praxis of teacher education. In contrast, the current imposition of standards and policies from the Australian Federal Government in relation to professional learning pays scant attention to the collective conditions in which these ambitious targets might be met. This distancing of the bureaucracy from the responsibility of implementation, which is the case with these targets for professional learning, was identified by Habermas (1989) as part of what he described as "the so-called objective constraints that are monetarizing and bureaucratizing more and more domains of life and increasingly transforming relationships into commodities and objects of administration" (Habermas, 1989, p. 44). The models of the PDS and demonstration schools discussed in this article provide historical evidence that productive working relationships are more important to the longevity of professional learning partnerships than the imposition of targets.

Unfortunately, as Habermas (1989) has argued, bureaucratic control is accompanied by monetarizing control as well. The new Centres for Excellence in Australia are working under our system of tied grants that are linked to short-term performance outcomes. In common with the Australian system of standardized testing, the outcomes cast a long shadow over the processes. In the light of this tighter control of the professional learning agenda, it is interesting to note recorded instances of school-university partnerships that have thrived without external funding. The Australian Project for Enhancing Effective Learning (Erickson, Minnes Brandes, Mitchell, & Mitchell, 2005),

the Coalition of Knowledge Building Schools (Groundwater-Smith & Mockler, 2009), and the Canadian Learning Strategies Group (Erickson et al., 2005) are examples of partnerships that have been sustained over time without the help of formal government funding. Indeed, key participants in all projects have acknowledged that this gives them the freedom to create a shared vision that represents the needs of all stakeholders (Erickson et al., 2005; Groundwater-Smith & Mockler, 2009). This concept of freedom from overt government control for both teachers and teacher educators was close to the heart of Findlay's Fielden endeavours almost a century ago in Manchester (A. Robertson, 1992).

These reforms in school-based teacher education offer important lessons for the Centres for Excellence currently operating in Australia. This lesson rests on Elmore's (1996, p. 499) argument that one of three policy conceits of educational reformers is "that the newest set of reform policies automatically takes precedence over all previous policies under which the system has operated" (p. 499). This "ahistoricism" is accompanied by the penchant of contemporary neo-liberal governments to focus more on the setting of performative measures rather than taking responsibility for the proper execution of process, including the recognition of historical models. In the complex area of teacher professional learning, this means that their well-funded and possibly well-intentioned performance targets might founder because of the lack of conditions conducive to genuine professional learning in schools:

> It is not just whether organizations (like a school, an education system, a medical practice or a professional body) create *learning* architectures that is at stake in the development of *praxis* and practice; it is that their architectures enable and constrain practices *themselves*. (Kemmis & Grootenboer, 2008, p. 57, emphasis in the original)

Performance benchmarks have been set in the Centres for Excellence, with meagre guidelines on how to create the conditions to achieve these. One guideline is: "Establish/build on existing performance and development systems, cultures and support mechanisms to promote continuous improvement" (Council of Australian Governments, 2009, p. 10). Government policy statements are by their very nature concerned with ends rather than means, so one should not be surprised by the lack of detail included in such benchmarks. However, it is of concern when these benchmarks are directly linked to short-term, tied funding arrangements. This could obviously lead to quite superficial processes of professional learning wherein the focus is on performative targets rather than on the development of sustainable professional learning cultures in schools. In contrast, there are lessons to be learnt from the sound research base underpinning PDS and demonstration schools, which could contribute to effective professional learning practice in the newly established Centres for Excellence in Australia. The most important lesson is that professional learning partnerships need long-term support from government funding without the

imposition of short-term targets. Long-term support will help to establish the kind of trusting relationships between teachers and teacher-educators that can lead to quality professional learning for all involved.

Demonstration schools and PDS's focus on the pedagogies of professional learning, which signals an upward shift in the status of the profession. It constitutes an elevation of the status of teacher professional learning beyond the mechanical and technical terms that have been and are used to describe this activity. Teacher professional learning is still often described as in-servicing or teacher development. The use of these terms denies the professional status of teachers undertaking professional learning in that it positions them as passive subjects of the servicing or development. In contrast, the teachers at both historical and current demonstration schools as well as PDS are active members of a community of practice *on teacher-practice*.

A shift in power relations is also evident for the university-based teacher educators who are active in the North Sydney Demonstration School partnership. Teacher Educators in the partnership context exert greater agency in a school to effect educational outcomes than they do as teachers of pre-service teachers at university because they can directly influence policy and practice. In some ways, the partnership offers a broader and more efficacious expression of what it is that teacher educators can and might do as they contribute to the professional learning of both pre-service and in-service teachers. A future direction might be for the university to offer a demonstration allowance to tenured academics. This would place the bonus on the salary rather than on infrastructure or projects and would formalise the partnership's move to a shared knowledge economy. In the current Federal government model of national partnerships, the university-based teacher educator receives very little recognition or recompense for their services. A cynical observer might even claim that the Australian government is trying to marginalise the role of teacher educators and universities in teacher education. This view is consistent with policy initiatives that have resulted in Australia adopting a version of the US Teach for America program wherein graduate students teach in hard-to-staff schools after a six-week preparatory program (see www.teachforaustralia.org).

The final area in which demonstration schools might contribute to the practice of school-university partnerships is governance. The Advisory Committee that was established at Fielden in the period 1890-1926 and emulated by North Sydney from 1975 to the present day offers a tested model of governance that encourages a reciprocal intellectual exchange essential to long-term sustainability. The partnership has had its tidal flows wherein one of the main stakeholders has exercised more operational control. However, the broad-based membership of the advisory committee and its transparent processes have served to provide necessary checks on any excesses. This equitable arrangement may be difficult to achieve given the short-term performance outcomes proscribed

in the National Partnership agreement (Council of Australian Governments, 2009). The Federal Government should devote attention to the processes and protocols of governance that will lead to sustainable improvement in student performance outcomes rather than temporary bounces in test results.

CONCLUSION

Current policy in teacher professional learning should go beyond the mere setting of performance targets that are tied to government funding. This paper has addressed the issue of the incommensurability of such practices in the context of teacher professional learning in Australia. The ahistoricism inherent in the disregard for existent models such as the demonstration school means that well-intentioned and well-funded performance targets might fail because of a lack of attention to existing professional learning cultures in schools; this ultimately constrains the implementation of these reforms.

The demonstration school and the sound research base of the PDS with its store of pedagogies of professional learning and model of governance enact a collective responsibility for the common good of teacher professional learning and student outcomes, which goes beyond the individualism inherent in neo-liberal educational policy:

> Professional practitioners like professional educators cannot and should not be made victims of the pursuit of improved 'quality' or 'best practice' as it is defined solely in terms of immediate, current resources and demands. (Kemmis & Grootenboer, 2008, p. 60)

It is unfortunate that the current welcome increase in Federal Government funding for teacher professional learning in Australia is being tied to the short-term targets of a government that needs to seek re-election every three years. In effect, this creates a body politic wherein the focus is on campaigning rather than policy reform. This political bind may work against the establishment of collaborative, sustainable professional learning cultures that lead to long-term reform rather than short-term targets.

This article has presented a discussion and a case study of examples of robust historical professional learning models. These models demonstrate the pedagogical relationships required to sustain professional learning partnerships between teachers and teacher educators. The task becomes to advocate that current funding from the Federal Government in Australia be re-directed to professional learning partnerships based on these successful historical models. This funding would need to be long-term, allowing for autonomy in setting local goals that work towards achieving long-term cultural change.

REFERENCES

Britzman, D. (2003). *Practice makes practice: A critical study of learning to teach*. Albany, NY: SUNY Press.

Bullough, R. V., Kauchak, D., Crow, N. A., Hobbs, S., & Stokes, D. (1997). Professional development schools: Cataylsts for teacher and school change. *Teaching and Teacher Education, 13*(2), 153-169. doi: 10.1016/S0742-051X(96)00017-0

Connell, R. (2009). Good teachers on dangerous ground: Towards a new view of teacher quality and professionalism. *Critical Studies in Education, 50*(3), 213-229.

Council of Australian Governments. (2009). *National partnership agreement on improving teacher quality* Retrieved from http://smarterschools.gov.au/nationalpartnerships/Pages/ImprovingTeacherQuality.aspx

Edwards, R. (1991). Theory, history, and practice of education: Fin de siecle and a new beginning. *McGill Journal of Education, 26*(3), 237-266.

Elmore, R. F. (1996). Commentary: school reform, teaching and learning. *Journal of Educational Policy, 11*(4), 499-504.

Erickson, G., Minnes Brandes, G., Mitchell, I., & Mitchell, J. (2005). Collaborative teacher learning: Findings from two professional development projects. *Teaching and Teacher Education, 21*(7), 787-798. doi: 10.1016/j.tate.2005.05.018

Groundwater-Smith, S., & Mockler, N. (2009). *Teacher Professional Learning in an Age of Compliance. Mind the Gap*. London: Springer.

Habermas, J. (1989). Neoconservative cultural criticism in the United States and West Germany. In J. Habermas (Ed.), *The new conservatism. Cultural criticism and the historians' debate* (pp. 22-47). Cambridge, UK: Polity Press.

Jensen, C., & Bee, B. (1981). North Sydney demonstration school. *School and Community News, 5*(2), 15-25.

Kemmis, S., & Grootenboer, P. (2008). Situating praxis in practice: Practice architectures and the cultural, social and material conditions for practice. In S. Kemmis & T. J. Smith (Eds.), *Enabling praxis: Challenges for education* (pp. 37-62). Rotterdam, NL: Sense.

Mule, L. (2006). Preservice teachers' inquiry in a professional development school context: Implications for the practicum. *Teaching and Teacher Education, 22*(2), 205-218. doi: 10.1016/j.tate.2005.09.011

Robertson, A. (1992). Schools and universities in the training of teachers: The demonstration school experiment 1890 to 1926. *British Journal of Educational Studies, 40*(4), 361-378.

Robertson, J. B. (1950). Demonstration teaching. *NASSP Bulletin, 34*, 231-236.

Robinson, W. (2004). *Power to teach: Learning through practice*. London:, UK Routledge Farmer.

Robinson, W. (2006). Teacher training in England and Wales: Past, present and future perspectives. *Educational Research and Perspectives, 33*(2), 19-36.

Rowe, K. J. (2003). The importance of teacher quality as a key determinant of students' experiences and outcomes of schooling. Melbourne, AU: ACER.

Sandholtz, J. H. (2002). Inservice training or professional development: Contrasting opportunities in a school/university partnership. *Teaching and Teacher Education, 18*(7), 815-830. doi: 10.1016/S0742-051X(02)00045-8

Smith, W. V. (1928). The function and the value of a demonstration school. *The Elementary School Journal, 29*(4), 267-272.

Snow-Gerono, J. L. (2005). Professional development in a culture of inquiry: PDS teachers identify the benefits of professional learning communities. *Teaching and Teacher Education, 21*(3), 241-256. doi: 10.1016/j.tate.2004.06.008

University of Sydney & New South Wales Department of Education. (1975). *Partnership agreement for North Sydney demonstration school*. Sydney, AU: NSW Department of Education.

West, R. L. (1925). Teacher-training through a demonstration school. *The Elementary School Journal, 25*(8), 619-626.

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INTERNATIONAL PRACTICA EXPERIENCES AS EVENTS OF INFLUENCE IN A TEACHER CANDIDATES' DEVELOPMENT

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ABSTRACT. Experience may influence beliefs and beliefs may influence practices. Following these premises, we investigated teacher candidates' post experience reflections nine months after an international practicum where they taught for three weeks in rural Kenya. Teacher candidates were placed in non-governmental organization (NGO) sponsored schools on the Maasi Mara southwest of Nairobi. They taught in both elementary (Standard) and secondary (Form) classrooms. Eleven of these candidates responded to a questionnaire with open-ended prompts requiring reflective responses about the perceived impact of their experiences both personally and professionally. Responses were analyzed using qualitative methods to identify common themes and recurring ideas. Examining participants' responses allowed us to consider how teacher candidates perceived their personal beliefs to impact their personal and professional practices. The significance of the international practica on personal and professional beliefs and practices was evident in responses. Concerns and advantages about the impact of the international experience are explored and directions for further research are identified.

L'EXPÉRIENCE D'UN STAGE INTERNATIONAL COMME ÉLÉMENT INFLUENT SUR LE DÉVELOPPEMENT DE FUTURS ENSEIGNANTS

RÉSUMÉ. Des expériences peuvent exercer une influence sur les croyances et ces croyances peuvent à leur tour influer les pratiques. Partant de ces hypothèses, nous avons analysé les réflexions de futurs enseignants neuf mois après une expérience pratique internationale d'enseignement de trois semaines dans une région rurale du Kenya. Pour les fins de ce stage, les futurs maîtres enseignaient dans des écoles subventionnées primaires (Standard) et secondaires (Form) d'une organisation non gouvernementale (ONG) de la région Maasi Mara, située au sud-ouest de Nairobi. Onze de ces candidats ont répondu à un questionnaire composé de questions ouvertes les invitant à réfléchir sur leurs perceptions de cette expérience sur les plans personnels et professionnels. Les réponses ont été analysées qualitativement afin d'identifier les thèmes communs et les idées récurrentes. Cet examen des réponses fournies par les participants nous a permis d'analyser comment les futurs enseignants perçoivent l'impact de leurs croyances personnelles sur leurs pratiques personnelles et professionnelles. La portée d'une expérience internationale sur les croyances

et les pratiques personnelles et professionnelles est clairement ressortie dans les réponses. Les préoccupations et les avantages relatifs à l'impact d'une expérience internationale sont examinés et des indications pour des recherches futures sont formulées.

In 2006, a small University located in Northern Ontario, Canada formed a partnership with a globally-active, non-governmental, non-denominational organization. The focus of this organization is on empowering each community where it undertakes a partnership. These partnerships include school building projects, health care services, developing alternative and sustainable income projects, and clean water projects and sanitation systems. In 2006, the partnership between the NGO and the University's Faculty of Education initiated an opportunity for teachers from newly built community schools in rural Kenya and teacher candidates from Ontario to exchange professional ideas about instruction and learning. Since then, teacher candidates from the University's two campuses have had the opportunity to engage in a practicum for three weeks in Kenya. As an organizational partner, the NGO benefits by having well trained Canadian teacher candidates available in Kenya to partner with the experienced teachers in that country. Canadian teacher candidates benefit by having Kenyan teachers and NGO workers teach them about the culture of Kenya and help them negotiate the differences in the educational system within the rural areas. The Kenyan teachers benefit from exposure to interactive instructional strategies, new resources, cooperative learning approaches, and opportunities to practice teaching in English. Teacher candidates participated in this practicum through selection by a faculty committee that looked for suitability for international placements, resilience to culture shock, and ability to adapt to different environments as assessed in their applications to participate and initial orientation meetings. Fundraising and students' own financial resources funded the practica. This meant that some students in the program were unable to participate because of financial restrictions. All of the students in the program took courses in education foundations, which addressed issues of cultural responsiveness, and many took a course in international teaching in advance of the experience (Villegas & Lucas, 2002). On their return, some participated in seminars in the international teaching class designed as a follow-up to their experience. Others made presentations to faculty and the University board of governors.

During the years that the NGO has worked to build schools in remote parts of Kenya, the organization has developed a reputation for good management and caring stewardship. The NGO vehicles are recognized throughout the country and given unhindered passage within the towns and villages. Village and rural residents are openly appreciative of the benefits of associations with the NGO and welcome the involvement of Canadian teacher candidates in their schools.

In this environment, we placed teacher candidates in sponsored schools for one practicum session in their teacher preparation year. During this placement, it was evident that teacher candidates found the experience beneficial and often referred to this as "life changing." Researchers, two of whom were participating in this practicum experience as supervisors, became interested in examining what teacher candidates meant by this expression. Answering the question of how their views of the experience would evolve over the short-term, after completion of their B.Ed. degree, became very important. What links existed between their "life changing experiences," their beliefs, and their practices in the classroom? What role did this experience in Kenya play in the new teachers' views on curriculum? How did the international experience in a developing world rural context impact both their personal and professional lives over time? This paper addresses these questions with an eye to the longer-term impact of international teacher practica.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The existing literature on the potential impact of international practice teaching experiences must be examined with several issues in mind. Reflection is an important aspect of the preparation of teacher candidates during their professional education (Schon, 1987; Van Manen, 1990). Similarly, reflection is an important activity for teacher candidates on international practica (Lee, 2005; Pence & MacGillivray, 2008). Lee does an excellent job of characterizing the number of different levels of reflection. These levels include non-reflection / description, mere recall, descriptive reflection / recall level, an attempt at simple explanation, dialogic reflection / rationalization level, involving exploration of alternative explanations from different perspectives, and critical reflection / reflectivity level, involving a critical analysis that situates reasoning within a broader historical, social, cultural or political context, with a view to changing or improving in the future.

The distinction between Lee's (2005) lower levels of reflection and the upper level is that the latter includes reflection that is used as a basis for action, particularly so in the classroom. Therein lies the notion of "reflective practice" (Schon, 1987; Van Manen, 1990). This was an important theme of the students' preparation year and is an expectation over the longer term for teachers. Reflective practice ensured that each teaching experience was considered with a professional, educative focus. The international practicum experience needed to receive the same introspection through formal reflection by teacher candidates because the possibility that this experience might impact the personal and professional lives of these candidates was substantial. The practicum provided that reflective opportunity through this research as it would not be common for pre-service teachers to reflect on standard practica to this degree nor in this timeframe. Research on reflective practice has also shown that teacher candidates develop greater awareness of themselves, their curriculum design,

and the teaching strategies they use (Mckay & Montgomery, 1995; Stachowski, 2001). This further supported our decision to initiate this reflective research several months after the international experience.

International teaching experiences have also been found to increase tolerance and respect for others and to contribute to personal development (Hull, 1974; Mwebi & Brigham, 2009). Conceptual change theory suggests that changes in perspectives are directly related to changes in experiences (Wilson, 2001). Such experiences create both personal and professional paradigm shifts for those who engage in them. Wilson found that international experiences had impacts in both cognitive and affective areas. This is the essence of conceptual change theory. The notion of culturally critical reflective practice is also significant in this context because the teaching practicum in a developing country is very different from pre-service practica in Canadian contexts. Teacher candidates need to be aware of the cultural component of what they do (Brookfield, 1995; Brookfield & Preskill, 2005), particularly in contexts different from their "home" university or "home" teaching environment.

International teaching experiences strive to provide opportunities for deeper understanding of and reflection on the world, and create global-mindedness among the teacher candidates. Grove (1980) described this as trying to create a feeling of identity with the total world community and a desire for diversity in personal relationships. Many international teaching program experiences assume as a goal that teacher candidates' understanding will be increased through exposure to other cultures (Korsgaard, 1971) and that teacher candidates will be better prepared to work in multicultural classrooms after an international teaching experience (R. Baker & Giachhino, 2000). The experience is offered to allow the teacher candidate to learn more deeply about culture through international practica immersion, which includes significant, direct personal interaction within the culture (Brislin & Cushner, 1996). Researchers have identified this outcome as a result of international teacher candidates' experiences abroad. Goals such as expanding world horizons, increased world-mindedness, and better classroom teaching upon returning home are common outcomes of such programs (B. Baker, 2000; Cole & Mulder, 1983; Korsgaard, 1971; Krogh, 1990; Wheeler, 1985; Williams & Kelleher, 1987).

International teaching in Africa brings with it particular challenges (Mwebi & Brigham, 2009). Within the University where this program was undertaken, there is institutional and individual memory of past practicum experiences in Africa. Past experiences in Kenya have provided the University with basic knowledge that is used to prepare participants practically (e.g., what to pack) and culturally (e.g., how to prepare for differences in family structures, resource availability, hygiene, and travel conditions). Very few participants have taken a course that includes any aspect linked to Kenya in their undergraduate studies, whether it be literature or politics (Thiong'o, 1977; Worger, Clark, &

Alpers, 2010). The Kenyan education system in which they are immersed is one of great variety (Eshiwani, 1993). The quality of education is dependent on location, local development, and affiliation with a well-established NGO (Somerset, 2007).

The teaching cohort in most countries is made up of a majority of candidates from the dominant culture. They bring with them a series of school practices embedded in their own cultural beliefs and their own experiences as students (Stuart & Thurlow, 2000). However, these teachers must be prepared to address minority cultures within their classrooms (Cushner, 1998). The international practicum is an opportunity to increase exposure to diversity that will better prepare teacher candidates for multicultural classrooms.

Theories of transformative learning (Bell, 2000; Cranton, 1998; Taylor, 2009; Walsh & Brigham, 2007) further enrich our theoretical framework and provide another means of examining our data. Through this theory we examined the changes in beliefs and values (e.g., Africentricity) as expressed by participants in this study. This approach allowed us to examine the participants' perception of the cultural differences and the significance of recognizing these differences to how the participants processed their experiences.

Previous research has emphasized the need to make a commitment to exposing teacher candidates to opportunities that educate them about the diversity in the world (Mwebi & Brigham, 2009). Studies of the value of international practicum experiences have asserted that teacher candidates learn about diversity, planning, and professionalism (Bryan & Sprague, 1997; Mundy & Manion, 2008). The teacher candidates develop understanding about the value of extra teaching experience, flexibility, content knowledge, preparing and selecting teaching resources, and methods (B. Baker, 2000). Classroom teaching strategies, curriculum development, human relations, global issues, self-discovery, and aesthetic knowledge are also influenced by international practicum experiences (Mahan & Stachowski, 1995). These studies have focused on the experiences of students during the practicum and the analysis of these experiences immediately upon their return. Our study has examined the perceived impact of the experiences nine months after the practicum.

Additionally, our theoretical framework is informed by Merrifield, Jarachow, and Pickert's (1997) synopsis of the likely outcomes of cross-cultural teaching experiences. Their study found that teachers with cross-cultural experiences are better prepared to work with diverse populations, understand the power and potential of world connections, teach global connectedness, make students aware of other perspectives, and appreciate and use cross-cultural instructional approaches. This framework directed some of our approaches to analysis of the participants' responses in our study and guided us to examine concepts related to diversity, connections, perspectives, and cross-cultural approaches as perceived by participants.

Opportunities to experience the culture shock of total immersion in a new professional environment force teacher candidates to reflect on the assumptions they hold about teaching, to teach more reflectively, and to discover new insights about themselves (Tice, 1992). Cushner and Mahon (2002) reported teacher candidates' awareness that they have faced opportunities to develop appropriate international understanding. Teacher candidates' reflections typically focused on their awareness of the impact of their beliefs about self and others as seen through their increased cultural awareness, improved self-efficacy, strengthened sense of global-mindedness, and improvements in their understanding and ability to work with students of diverse backgrounds (Bradfield-Krieder, 1999; Pohan, 1996; Sleeter, 1995).

Growth is related to reflections on the experiences and related to gaining insights about the participants' strengths, limitations, values, and ability to adapt both personally and professionally (Mahan & Stachowski, 2001). The reflections of internationally experienced teacher candidates showed that they were less likely to see experiences as a tourist program and to consider the professional effects of the experience (Stachowski, 2001). International experience can help to prepare teachers to be culturally sensitive and responsive in their teaching by designing their instruction to meet students' needs, cultural characteristics, abilities, and interests (Mahan & Stachowski, 2001). An international teaching experience creates opportunities for new insights to develop, better teaching to accrue, and happy memories to be recalled (Mahan & Stachowski, 2001). These researchers also found that 73% of the changes that internationally experienced teacher candidates reported were personal in nature while 27% were professional. This indicates that the transformative nature of the experiences may be most prominent thereby affecting participants' core values and beliefs. Since the changes are so central to core beliefs and values, they may impact their professional practices. This finding also seems to emerge from other studies. Varying approaches to classroom discipline were the most common professional change. Mahon and Stachowski observed their students to be more self-assured, have greater poise, and be less "collegiate" in character, concluding that personal and professional changes and adaptations became inevitable processes as an outcome of the international experiences. However, various studies have shown that changes, while transformative, may be very differently realized, and some transformative outcomes may be more or less evident as the theoretical frameworks of the studies vary.

Some research has considered the longer-term impact of international teaching experiences on teachers' professional behaviour (Davidson and McCain, 2008; Willard-Holt, 2001; Wilson, 1993). This research has spoken of the long-term effect of students becoming more multicultural in their teaching (e.g., pursuing ESL certification) and empathetic in their classroom practice. Bachner and Zeutschel (2009) examined the outcomes of four decades of exchanges between the United States and Germany. They concluded that the results of such sojourns

are very complex, but that the impact of these activities was more substantial the greater the length of the stay (Bachner & Zeutschel, 2009; Davidson & McCain, 2008; Willard-Holt, 2001). Carlson spoke of stronger cultural interest and less of a domestic orientation, maturation in international students' personal and social lives, and of greater cooperation in their subsequent group activities (Carlson, Burn, Useem, & Yachimowicz, 1990).

Research has identified a wide range of potential impacts of these international teaching opportunities. However, much of the research does not address impacts that are evident when the cultural context of the international teaching experience dramatically contrasts with the teacher candidates' previous life experiences. In the practicum context, teacher candidates experienced new language, monetary systems, security issues, classroom resources, living conditions, family relationships, flora and fauna, health services, and professional interactions and standards. Much of the literature addresses individual placements in European cultures. Our study addresses practicum experiences in a group context in a developing country, which created a learning community among participants who lived, planned, and taught together. It is to this gap in the research that we wish to address our efforts through our own theoretical framework. By amalgamating the theories of reflective practice, conceptual change, and transformative learning, we developed an analytical framework for examining our participants' open-ended responses to two prompts. The resulting framework allowed us to examine responses by identifying participants' curriculum view, worldview, and sense of personal empowerment. Within this broad framework, we were able to identify several sub-themes relative to participants' perceptions of their own changed perspectives. The rich narrative (Sacks, 2010) of our candidates' responses provided data that informed the development of many sub-themes within broader categories of frameworks devised by previous researchers.

The framework used to analyze our candidates' responses represents the primary way in which this work extends the current scholarship. Teacher candidates from Ontario who taught in rural Kenya were challenged by coming face to face with the dichotomies of shifts in their views of these significant areas of their personal and professional identities. We will demonstrate how we used the participants' curriculum beliefs, worldviews, and sense of personal empowerment to frame their reflections.

METHODOLOGY

Qualitative methods (Creswell, 2002; Creswell, 2009; Merriam, 2001) were used to examine teacher candidates' responses to two open ended questions. Responses were collected through surveys. The two questions were, "What difference has this trip made to your personal life?" and "What difference has this trip made to your professional life?"

None of the researchers had any professional connection to any participants following the practicum. For this reason, an electronic questionnaire approach was chosen. The survey was structured to allow for unlimited space to respond. By posing these questions electronically as open-ended and broad we were allowing for a full scope of responses and response lengths. The wording of both questions was designed to reflect the teacher candidates' continuous reference to the term "life changing" while the experience was in progress. As we had daily contact with the candidates during the international practicum, there were many opportunities for reflective conversations about individuals' perceptions of their experiences. That the candidates expressed differences in their views towards life and work prior to and after the international practicum experience was absolutely clear. This has also been documented elsewhere, notably in Johnstone's work (Johnstone & Corce, 2010).

The researchers' role as participants in the practicum experience as supervisors created an interesting dynamic in relation to the research. As researchers, we found that we each considered the practicum supervision experience to be life changing for us. This caused us to be interested in the impact on candidates who were younger, less well-travelled, and involved in professional practice in a new international context. One of the researchers had previous experience supervising another international practicum, but the context was in urban England.

The participants' reflections on their international practicum were analyzed using the techniques of general inductive approaches to qualitative research (Creswell, 2002; Creswell, 2009; Merriam, 2001; Thomas 2006). This approach requires researchers to question core meanings evident in the text, extract major themes or categories, and describe the most important themes. Using this approach, each participant's response was analyzed for themes. Once recurring themes were identified, responses were reanalyzed within the resultant framework. Using independent parallel coding (Thomas, 2006), typical narratives were selected to exemplify key ideas (Williams & Irurita, 1998) for both the analysis and discussion that follow.

Seventeen teacher candidates participated in this teaching practicum in rural Kenya, and they constituted the sample group. The candidates were between 22 and 28 years old, both male and female, and all in the final year of their B.Ed. program. This experience was outside their cultural background, as determined by the selection data provided to trip organizers. While many participants had travelled outside of Canada, none had travelled to a developing country. All participants were born in Canada, and only one was a first generation Canadian from parents who immigrated from the Middle-East.

Eleven teacher candidates responded to the written questionnaire nine months after the practicum. This time period was chosen for two purposes. The first reason was the opportunity to create distance between the pre-service prepara-

tion program with its international element and the participants' integration into the workforce as teachers or through other employment (i.e., the gap between January and September when many would have started new employment). The second purpose was to create a time distance from the experience to give participants time to reflect on their experiences. Those who did not respond, either did not answer the initial call for participation, or did not have forwarding email addresses.

By examining the reflections of the candidates we were able to focus on their perceptions of the sustained impact of their experiences. There was no set timeline for returning the questionnaires which were sent, but all responses that were received were returned with three weeks of solicitation. Some of the respondents are currently teaching in other countries, some are teaching in Canada, and some are working on alternative careers while applying to full-time teaching positions. Their reflections were analyzed for common themes and recurring ideas as identified by the researchers. Responses ranged between two and four pages in length.

Responses were sorted by frameworks developed by earlier researchers (Bryan & Sprague, 1997; Mundy & Manion, 2008) to determine trends and to code reflections. The Bryan & Sprague framework focused on examining seven impacts of international teaching experience. These impacts include initial hiring, retention in teaching, awareness of individual differences in students, attitudes toward a second language, curriculum choices, teaching flexibility, and teaching strategies that celebrate children's uniqueness. The alternate framework developed by Mundy and Manion was used for a second tier of analysis. This framework identified six components that characterize typical reflections about international experiences related to global education. These experiences are categorized as viewing the world as an interdependent system, commitment to basic human rights, valuing cultural diversity and intercultural understanding, belief in the power of individuals, commitment to child centred pedagogy, and commitment to planetary sustainability.

While neither of the previously-used frameworks was a complete match to our questions and participants' responses, we were able to use some elements from each framework. Conceptual change literature provided some direction about how to relate students' changes in practice to stated changes in beliefs, as both were evident in their responses. Conceptual change is based on constructivist theories. The premise of conceptual change relies on opportunities to examine personal beliefs as well as the change in those beliefs as a result of experience and time. Accommodation of new ideas is a critical component of conceptual change. Such accommodation was achieved in this study by requiring removed (in time) reflective responses that promoted deliberate cognitive processing (Dole & Sinatra, 1998; Gregoire, 2003). Deliberate processing about the impact of the experience was achieved by questioning participants many months after the

experience and structuring their responses to evoke both personal and professional beliefs and practices or intended practices (Mezirow & Taylor (2009). Specific responses were itemized and then coded to align with previous research (Bryan & Sprague, 1997; Dole & Sinatra, 1998; Gregoire, 2003; Mundy & Manion, 2008; Thomas, 2006). A framework specific to our study responses evolved as we examined and coded patterns as expected in qualitative research (Creswell, 2002; Merriam, 2001; Thomas, 2006). The approach to reporting that follows was drawn from the work of Williams and Irurita (1998), consisting of labeling the inductively derived categories, describing each category, and quoting from the raw data text to elaborate the meaning of the category and to show the type of text coded into the category. This sequence for coding data is used for each sample quote provided in the analysis section.

The opportunity to examine the two questions of our study allowed us to consider how teacher candidates perceived their personal beliefs to impact their personal and professional practices. The researchers sorted responses into more finely defined categories that reflect previous research, conceptual change theory, global education theory, and teacher candidates' expressed beliefs, including personal and professional practices.

ANALYSIS

Teacher candidates' personal and professional beliefs and attitudes were expressed in their responses. Additionally, responses addressed many practices or intended practices in both respondents' personal and professional spheres. Re-sorting the elements of the Bryan and Sprague (1997) and Mundy and Manion (2008) frameworks allowed the researchers to reexamine the responses of teacher candidates and align common elements to express findings under three broader headings: Curriculum Beliefs, World View, and Personal Empowerment. These categories encapsulate the premise that teacher candidates' personal beliefs after the international practicum experience would align with their professional and personal practices both present and intended (Table 1). Quotes from participants' personal narratives are used in the following sections to exemplify recurring themes found throughout their responses. These quotes are typical of the narrative responses and therefore indicative of a broad perception among the participants.

It was evident from the structure of teacher candidates' responses to their Kenyan experiences that their existing view of the curriculum and their worldview created the sense of personal empowerment to influence change. This is consistent with conceptual change theory because accommodation through reflection clarified beliefs and the relationship between expressed beliefs and practices or intended practices. These findings are also consistent with the previous work of Hull (1974), Wilson (2001), and Mwebi and Brigham (2009).

TABLE 1. *Analysis framework to relate beliefs and attitudes to present and intended practice and previous research.*

Curriculum View	World View	Personal Empowerment
Commitment to child-centered pedagogy	Commitment to planetary sustainability	Belief in the power of individuals.
Awareness of individual differences in children	Viewing the world as an interdependent system	
Curriculum choices	Commitment to basic human rights	
Teaching strategies that celebrate children's uniqueness	Valuing cultural diversity and intercultural understanding	

Teacher candidates' *curriculum views* reflected their awareness of changes in beliefs and attitudes indicative of conceptual change (Gregoire, 2003). Curriculum views incorporate teacher candidates' perceptions of their commitment to child-centered pedagogy, awareness of individual differences in children, curriculum choices, and teaching strategies that celebrate children's differences. Candidates were aware of the need for specific types of curriculum choices to teach in a new environment. They showed awareness of the importance of modeling as a teaching strategy to optimize learning in a resource-poor classroom. The lack of resources in Kenya caused the candidates to stretch their understanding of potential teaching strategies. They became increasingly aware of the need to model in an energized and enthusiastic way to engage learners, especially in response to language differences.

> I was able to see constructivism in action and learned that proper modeling is paramount. For instance, one day I created a multiplication game with dice. I went over the game instructions taking for granted that the students would know that to roll a die you must shake it in your hand and then toss. When the game was to start I handed the dice to one of the students and she just stared at me...lesson number one.

In this narrative, the pre-service teacher shows that she had become increasingly aware of the need to centre curriculum on the child, be aware of differences in children on an individual basis, and use teaching strategies that celebrate the uniqueness of each child. She discovered that the child's culture and her own teaching-strategy effectiveness are closely linked.

These teacher candidates were well trained in the use of technology (through a laptop program component) in the classroom environment and showed adaptability in classroom situations where technology was not available. Teacher candidates were aware of the need to adapt and create resources to meet the various needs of students and to adapt the resources to bridge language differences. They showed awareness of the language differences as a barrier to instruction, emphasizing the need to accommodate learners, and the need to

develop new strategies to address the gap. They were aware of the need to address different learning styles and particularly to include lesson components that addressed visual, kinesthetic, auditory, and verbal learning styles. They were aware of the richness and value of collective planning as a resource to expand teaching strategies to address different aspects of the curriculum. They valued a student centred, experiential learning environment and created instructional strategies to promote this approach.

> Lessons that were engaging and that allowed students to be active participants propelled their interest in learning. One particular day we were learning about animals so I planned a read-aloud re-tell. I can't even begin to describe how absolutely enthralled the students were when they had the opportunity to use puppets for their retell. It was quite possibly one of the most rewarding days that I had.

This narrative demonstrates the pre-service teacher's curriculum views as evolving toward more child centred pedagogy but also demonstrates growing value for the need to teach with cultural diversity and intercultural understanding through her curriculum choices. The pre-service teacher is also aware of how her actions had power as she worked with others; in this case she demonstrated awareness of the power to influence the eagerness and engagement of her young students.

Responses indicated that the teacher candidates were aware of their own shift in thinking from focusing on their teaching as they worked with students to focusing on the students' learning. Teacher candidates were aware of the need to enrich their teaching by learning more about the Kenyan culture and their students' tribal history and the values and aspirations of the local community. Finally, teacher candidates consistently expressed awareness of the value of building strong relationships with their students by learning about their families and their plans for future education.

Teacher candidates' worldviews reflected their awareness of changes in beliefs and attitudes that indicated conceptual change. Worldviews include a commitment to planetary sustainability, viewing the world as an independent system, commitment to basic human rights, and valuing cultural diversity and intercultural understanding. Teacher candidates unanimously showed awareness of increased sensitivity to resource conservation, particularly related to water use. This awareness extended to the careful use of other resources that might normally be available in a classroom. A recurring theme was awareness that they had once taken many things for granted and were inclined to be more aware of their advantages and less likely to assume their availability.

> Whether I've left a light on or spilled some water, I always think of those smiling young faces at Enelorai who were so happy yet lived on so little. Personally I know that my trip to Kenya was only the beginning of a lifelong journey...I now aim to bring awareness of these issues to those who have not seen it for themselves. I bring my photographs, my bracelets, my stories,

> and a big smile with me wherever I go and it is amazing how many people will stop and listen.

This brief but richly emotive narrative demonstrates the teacher candidates' awareness of many aspects of their evolving worldview, including a commitment to planetary sustainability and their view of the world as an interdependent system. Their belief in their personal power to influence the views of others is evident in their optimism about the power of their stories.

Many respondents spoke about a new awareness of the disparity of opportunities available across nations. They expressed appreciation for their own strong education and awareness of the disparity between the educational opportunities available in Canada and the unappreciative attitude towards educational opportunities evident in their current students in both Canada and England. Many contrasted this with the overt appreciation expressed by Kenyan students and their parents who viewed the opportunity for education as a privilege. Teacher candidates expressed strong awareness of the basic unfairness of the medical care opportunities available in Kenya in contrast to those available in many parts of the world.

> Many have so little…the clothes on their backs, the shoes on their feet (sometimes), some dirty drinking water, a pen and some paper, their families and each other, yet they are much happier than the majority of the population in other countries who have excessively more. They will walk six miles or more, cross a river, walk with their livestock, and fetch muddy water just to get to school. It has made me wonder…

Through this story and the contrast of cultural norms and socio-economic disparities it reveals, this teacher candidate makes their commitment to basic human rights evident in a narrative that also shows their respect for the cultural diversity that they experienced in this context.

Responses indicated a strong awareness of the value of relationships with their students. The teacher candidates were aware that their students were offering relationships in ways that are distinctly different from previous ways they had built teacher-student relationships. Connections were initiated by strong smiles that welcomed interaction, followed by student initiated greetings and questions. The overt curiosity of the students was consistently the starting point for an open and caring connection with their teachers. Teacher candidates were aware of the high level of happiness of their students and the contrast between the level of happiness and the extreme poverty. They expressed that their students saw happiness as a function of strong relationships and not as a function of material wealth.

> Whenever I'm asked where I got my smile from, I say Kenya… because although I was able to smile, I never really used it until my visit. Such a small thing as a smile makes a tremendous difference in life. It represents happiness and love that others grow warm to.… A smile is a tool that opens

> hearts and minds, a teacher's first task. This is what the local Kenyan people did for me; although they had never met me before they welcomed me with open arms and accepted me because I was there.

This teacher candidate expresses their new found belief in the power of the individual to influence others, while expressing awe and admiration for the spirit and resilience of a new culture, diversity within the culture, and the cultural values that support and enliven the culture.

Candidates learned that family values are central to the structure of rural Kenyan society, and they realized the extent to which the strength of the family affected the quality of the students' interactions with others.

> The experience made me fall in love again; with them, with life, with my family and friends, and those close to me. It brought on a new appreciation for many things I didn't think of before ... rain, sun, clean water, and food.

This narrative demonstrates the profound impact on the pre-service teacher's beliefs, which manifested in a new sense of appreciation for their own life circumstances. By valuing the cultural diversity he experienced, the pre-service teacher has altered his worldview to see the world as an interdependent system where understanding of another culture has made him more appreciative of his own culture.

Teacher candidates were aware of alterations in beliefs and attitudes that indicated conceptual shifts related to personal empowerment of themselves as teachers and as ambassadors for change. Most candidates viewed the Kenyan experience as fostering intentions to become involved with many more international teaching and volunteer efforts.

An adjustment in their perspective of themselves as change agents was evident. The teacher candidates now see themselves as a nucleus that has the power and motivation to make changes that can ripple across to others.

> My life is richer because of my experience in Kenya. I feel in my heart the voices of the people there who asked us for nothing and gave us so much happiness. My life is happier because when I was in Kenya I experienced true authentic happiness. I saw firsthand what it was like to have so little and still wake up every morning enthusiastic about life.... The children enabled me to experience what it was like to love people you have never met before.

This quote exemplifies the profound impact on an individual's sense that their experience was somehow enlightening in a way that has the potential to influence future action. The personal empowerment of the teacher candidates is expressed by them as their ability to really understand the nature of happiness. Both their worldview and sense of personal empowerment were evidently influenced by the emotional responses and reflections to some experiences.

The teacher candidates consistently expressed the power to influence change in any circumstances and the intention to pursue volunteer work with an

international scope. They consistently expressed their desire to extend their new understanding of poverty related issues to those in their immediate social spheres, including family and friends.

> ...people hear of the devastating world that many people are living specifically in central Africa but by seeing it through your own eyes you can convey that message with more meaning, emotion, and compassion that I believe is well received by those around you. Going to Kenya and working with [the NGO] has become something that I will never forget and hopefully I will continue to work with them. As teachers we have the power to influence others and to continue to work in direct ways with the organization. I cannot wait until the day that I can arrange my very own trip with a group of students and once again embark on a Kenyan adventure and share it with young minds and instill the passion in them that was instilled in me.

This teacher candidate recognizes the personal empowerment he developed through this experience as a form of passion. He expresses the strong intent to use that passion to influence others. His recognition that he can "have the power to influence others" is indicative of the oft-repeated phrase that this experience would change each person's personal and professional outlook in profound ways.

However, the responses from teacher candidates were not as consistently positive in outlook as the previous excerpts indicate. Many indicated frustration with the inability of their family and friends to understand the depth and breadth of the issues facing the people of Kenya, and some indicated awareness that their own understanding was directly related to experience. Many felt that experiencing the culture, with its historical, social, and economic differences, firsthand was essential to understanding the challenges faced by the people in the culture. A sense of re-entry shock and re-acculturation challenge was common in pre-service teachers' narratives. The dichotomy evident in the participants' observations about their own normal daily lives and what they experienced in Kenya formed the basis for much inner searching for meaning; this theme will be explored further in the discussion section of this paper.

Personal values were profoundly affected by the practicum experience. Teacher candidates gave strong indication of the impact of working toward redefining how they conceptualize their own happiness as a state less connected to material wealth than previously.

> It really made me think about the way a lot of us live our lives...we take so much for granted and bombard ourselves with unnecessary novelties. It often seems that despite everything that we acquire and own it is never enough and we are never truly happy.

They indicated a personal understanding of the concept of sustainability as it relates to their own lives. Their commitment to making a difference for others was evident in their expressed intentions for action. Their commitment to social justice as a topic for their own classroom practice was evident in all

responses. Their intention to live more consciously as they continue their own development was in strong evidence. Changes in the teacher candidates' beliefs were causing them to consider changes in their personal and professional actions.

The development of teacher candidates' sense of global mindedness was evident in every response. Responses indicated an awareness that represents deeper understanding and identity with the world community (Grove, 1980). The opportunity for teacher candidates to teach in rural Kenyan schools and to have structured ways to reflect on their experiences have increased awareness of the impact of their experiences on their views of curriculum, the world, and their sense of personal empowerment within their expanded view of their areas of influence. The emotive power of many of the teacher candidates' reflections resonate with the concept that such experiences "tug(s) at the heart" (Wilson, 2001). Specifically, our study shows that these tugs at the heart were evidenced through changes in curriculum views, worldviews, and personal senses of empowerment.

DISCUSSION

Previous research has shown that there is value in international experiences. Conceptual change theory has traced the historic evolution of an individual's perceptions before and after experiences as a product of reflection on dissonant experiences and accommodation in response to new information. Previous researchers (Bryan & Sprague, 1997; Dole & Sinatra, 1998; Gregoire, 2003; Mundy & Manion, 2008) provided frameworks and criteria for analyzing students' international experiences. Using each of these filters, the researchers examined and sorted teacher candidates' reflective responses to opened ended prompts and determined which of the responses indicated evidence of growth in their views of curriculum, the world, and their personal efficacy as a change agent.

Teacher candidates had prior knowledge of teaching theory and practice in Canadian classroom contexts. In the resource-poor context of Kenyan classrooms, they had intensified opportunities to connect theory with instructional practice. The lack of resources caused teacher candidates to consider alternative ways of teaching. The necessity to create resources and the opportunity to discuss their plans for approaching every lesson in a rich collaborative environment supported by knowledgeable faculty advisors allowed teacher candidates to reconceptualize their approach in order to focus on how students would learn rather than retaining a focus solely on how they would teach. This allowed them to gain new insights into the theoretical use of active learning, student-centred approaches, modeling, and the role of visual, kinesthetic, and tactile resources. They saw the need for differentiation of classroom resources as a necessity for learning.

Adjustments in teacher candidates' worldviews were evident through their reflections in both personal and professional examples. Candidates consistently expressed awareness that their post-trip beliefs were vastly altered by their experiences. They consistently spoke of an altered view of what constitutes happiness. Post-experience reflections indicate a view of happiness as being reflective of strong, invested relationships rather than reflective of material wealth. Candidates viewed resource acquisition and use differently as a result of their experiences. They no longer assumed that materials would be readily available and were more prepared to develop and adapt materials to ensure effective learning for their students. Adjusted worldviews reflected increased attention to social justice and sustainability concepts in both personal and professional applications.

After this experience, teacher candidates saw themselves as new ambassadors for social change with the beliefs, attitudes and skills to affect change through personal action. Their confidence was based on practicum successes and beliefs about their own competence to be ambassadors for sustainable social change. They expressed strongly that new knowledge about global issues will be the basis for new actions for themselves, both personally and professionally. Because teacher candidates saw things differently, they expressed their intentions to do things differently.

This study is limited in that it analyzed written narrative data collected from a small cohort. The data are emotively strong and many comments cited here were typical across participants. The location of the experience, the size of the participant group, and the very close living conditions during the experience (in mobile camps, tents, with shared facilities and common eating areas and meals) created a very intimate environment. As teacher candidates worked in teaching dyads in each classroom, they also became aware of each other's professional practices during the three weeks they spent teaching in the rural Kenyan schools. This intimacy may have influenced the common wording that became part of the reflective practice discussions during the experience and the written narratives that were provided in response to the research prompts.

While this University sends two groups of teacher candidates to Kenya's rural schools to teach each year, and has done so for the past eight years, the experiences and their immediate and longer term impacts are only recently being investigated. The structure of this study is directly related to the fact that researchers also participated in the experience and were involved in participants' discussions on-site about their observations and insights. The repetition of the term "life-changing" in these conversations during the three-week practicum led researchers to interrogate the longevity and the interpretation of this concept as participants moved on after the Kenyan practicum.

This study shows that, at some remove from the experience, participants still recognize the range of impacts the experience had on their professional

identity, career goals, and intentions about how they will teach. It is evident from their narratives that they have made shifts in their curriculum views toward more child-centred practices. They have made shifts in their worldviews toward more inclusive, compassionate, interdependent, and respectful understanding of another culture. These outcomes cannot be undervalued. However, their longevity as personal and professional perspectives requires further investigation. It will be interesting to revisit this same cohort later in their careers to determine the possible trajectories they attribute to their three weeks in rural Kenya.

CONCLUSION

Teacher candidates identified clear links that related expressions of beliefs and attitudes to current or intended practices. These links were evident in both personal and professional arenas. Although previous research models provided some categories for coding teacher candidate responses, in this study it was helpful to consider responses within the broader categories of curriculum views, worldviews and perceptions of personal empowerment. The coding and data sorting process that was used allowed researchers to examine links between views indicative of beliefs and attitudes and the related practices and intended practices. Teacher candidates consistently demonstrated personal appreciation and recognition of the strength of the impact the experience of teaching in rural Kenya has. Increased awareness of the efficacy of child-centred practices for instruction is anticipated to influence the professional practice of these teacher candidates. For candidates, their expressed commitment to pursue global initiatives and social justice issues in their classroom is directly linked to the power of their experiences in Kenya. Many of their positive views of this experience are expressed in effusive language.

The sense of disconnectedness from family and friends who had not experienced what the teacher candidates had experienced was evident in several reflections. This powerful sense of some teacher candidates being very disturbed about their inability to make family and friends share their new understanding is an area that requires further investigation.

> After about a week or so [after] returning to Canada I was very reserved, quiet and did not want to engage with too many people, only because I felt like I had experienced such a rich world and life that I felt as though everyone here was living blindly and they are content with what they knew and didn't know. I felt as though they did not want to hear or know about another world, a better world in my opinion, so I stayed quiet and to myself. I was having an extremely hard time with bridging the gap and managing my own emotions and beliefs. I tried to stay quiet, but I found when I would open my mouth, especially around my parents and my best friend, they would get angry or upset with my views and attitude. I became very frustrated with others' inability to see things in a different light. I understand and respect the opinions of others, but the unwillingness and stubbornness to listen

> to something different and possibly view things in a different light made/ makes me extremely angry. I found this amongst many of my Canadian and American friends and family.

Opportunities to share experiences as a group in more formal and structured contexts immediately following an international practicum in a developing country context may be necessary to support teacher candidates' processing of their experiences and to bridge their sharing of experiences with family and friends. This additional opportunity for processing experiences could support teacher candidates in understanding the communication challenges they may face with reentry into their own culture. Such debriefing could take many forms, including presentations to others who had not experienced their international practicum, focus group research formats, sharing sessions that relate to retelling their experiences, and instruction about reentry psychology. It may also be beneficial to have experienced faculty advisors who are familiar with the host country and its culture to supervise such an international practica. This would prepare participants for the profound emotional impact of their experiences more fully.

This study has provided initial data and a conceptual framework for examining teacher candidates' reflections about international practica. Future research will examine the long-term impact of this experience on both professional and personal practice in relation to issues around sustainability and social justice and instructional practice as these teacher candidates begin their professional careers. It will be informative to examine the longevity of impacts as they relate to participants' ideas about poverty, race, worldview, diversity, personal beliefs, and commitments to social action several years after the experience they saw as transformative at the time. Additionally, international volunteer or employment histories will be tracked to determine the longitudinal data related to their interaction with international agencies. Many of the teacher candidates have continued their personal involvement with the NGO as volunteers. It will be indicative of the long-term impact of their practicum experiences if this involvement is sustained over the longer term.

Personal oral histories using additional questionnaires taken at the three and five year marks may illustrate further the impact of this practicum, or may indicate the receding impact of this experience as other demands of daily life impinge on time and focus. Qualitative data could be collected in relation to some of the logistical information about teacher hiring, job retention, international teaching experience, job satisfaction, and international involvement. This may expand our understanding of the long-term impact of this powerful placement experience.

The convergence of teacher candidates' curriculum views, their worldviews and the resultant impact on their sense of empowerment is reflected in this powerful quotation:

> Kenya gave me the confidence to apply for positions in developing countries and I believe that I will be successful when I am in a challenging situation.... [This experience] gave me the confidence to follow my path to make a meaningful difference in the world.

There is no doubt that teacher candidates, as reflected in the data collected for this study, felt that they were strongly influenced by the experience of teaching in a developing country during this three-week practicum. More longitudinal data is needed to determine the direction and sustainability of this impact both personally and professionally over time.

REFERENCES

Bachner, D., & Zeutschel, U. (2009). Long-term effects of international educational youth exchange. *Intercultural Education, 20*(4 supp 1), 45 - 58.

Baker, B. (2000). "Moving beyond our education community: Student teaching abroad". paper presented at the *2000 Annual Meeting of the Association for Childhood Education International*, Baltimore, MD.

Baker, R., & Giachhino, R. (2000). *Building an International Student Teaching Program: A California/Mexico experience*. Mexicali: CA: California State University, Centro de Ensenza Tecnica y Superior.

Bell, L. (2000). Impact of a cultural diversity teaching practicum on interpersonal competency of student teachers. *Journal of Agricultural Education, 14(2)*, 11-18.

Bradfield-Krieder, P. (1999). Mediated cultural immersion and antiracism: An opportunity for monocultural preservice teachers to begin the dialogue. *Multicultural Perspectives, 1*(2), 29-32.

Brislin, R., & Cushner, K. (1996). *Intercultural interactions: A practical guide*. Newbury Park, CA: Sage.

Brookfield, S. (1995). *Becoming a critically reflective teacher*. San Francisco, CA: Jossey-Bass.

Brookfield, S., & Preskill, S. (2005). *Discussion as a way of teaching: Tools and techniques for democratic classrooms*. San Francisco, CA: Jossey-Bass.

Bryan, S., & Sprague, M. (1997). The effect of overseas internships on early teaching experiences. *The Clearing House, 70*(4), 199-201.

Carlson, J., Burn, B,, Useem, J. & Yachimowicz, D. (1990). *Study abroad: The experience of american undergraduates*. Westport, CT Greenwood Press.

Cole, D., & Mulder, R. (1983). *Developing an international education program in pre-service teacher training*. Paper presented at the World Assembly of the International Council on Education for Teaching, Washington, DC.

Cranton, P. (1998). *No one way: Teaching and learning in higher education*. Toronto, ON: Wall & Emerson.

Creswell, J. W. (2002). *Education research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Merrill Prentice Hall.

Creswell, J.W. (2009). *Research design: Qualitative, quantitative and mixed methods approaches*. Thousand Oaks, CA. : SAGE

Cushner, K. (1998). *International perspectives on intercultural education*. New York, NY: Routledge.

Cushner, K., & Mahon, J. (2002). Overseas student teaching: Affecting personal, professional and global competencies in an age of globalization. *Journal of Studies in International Education, 6*, 44-58.

Davidson, J., & McCain, T. (2008). Multicultural sensitivity Through international student teaching. In T. Huber-Warring (Ed.), *Growing a soul for social change: Buliding the knowledge base for social justice* (pp. 163-176). Charlotte, NC: Information Age Publishing.

Dole, J. A., & Sinatra, G. M. (1998). Reconceptualizing change in the cognitive construction of knowledge. *Educational Psychologist, 33*, 109-128.

Eshiwani, G. (1993). *Education in Kenya since independence*. Nairobi, KE: East African Publishers Limited.

Gregoire, M. (2003). Is it a challenge or a threat? A dual-process model of teachers cognition and appraisal during conceptual change. *Educational Psychology Review, 15*, 147-179.

Grove, C. L. (1980, May-June). Using international experiences to build global perspectives: Student exchanges. *Global perspectives newsletter*.

Hull, W. F. (1974). *The American undergraduate off-campus and overseas: A study of the educational validity of such programs*. Toledo, Ohio: Center for Study of Higher Education, Toledo University.

Johnstone, C., & Corce, H. (2010). "I have been given the power to teach. The children understand me very well." The social and academic impact of deaf teacher training in Kenya. *International Review of Education, 56*(1), 149-165.

Korsgaard, R. (1971). Student teaching abroad. *Supervisors's Quarterly, 6*(2), 32-34.

Krogh, S. (1990). *The integrated early childhood curriculum*. New York, NY: McGraw-Hill.

Lee, H.-J. (2005). Understanding and assessing preservice teachers' reflective thinking. *Teaching and Teacher Education, 21*, 699-715.

Mahan, J., & Stachowski, L. (1995). Learning from international field experiences. In G. A. Slick (Ed.), *Emerging trends in teacher preparation: The future of field experiences* (pp. 52-59). Thousand Oaks, CA: Corwin Press.

Mahan, J., & Stachowski, L. (2001). Self-reported reshaping effects of foreign student teaching upon young teachers. *Education, 112*(3), 329-346.

Mckay, J., & Montgomery, J. (1995). *Changes in perceptions: A comparative study of the experiential learning of international student teachers*. Paper presented at the 1995 Annual Meeting of the American Educational Research Association, San Francisco, CA.

Merriam, S. B. (2001). *Qualitative research and case study applications in education: Revised and expanded from case study research in education* (2nd ed.). San Francisco, CA: Jossey-Bass.

Merrifield, M., Jarachow, E., & Pickert, S. (1997). *Preparing teachers to teach global perspectives.* Thousand Oaks, CA: Corwin Press.

Mezirow, J., & Taylor, E. W. (2009). *Transformative Learning in Practice: Insights from Community, Workplace, and Higher Education.* San Fransico, CA: John Wiley & Sons.

Mundy, K., & Manion, C. (2008). Global education in Canadian elementary schools: An exploratory study. *Canadian Journal of Education / Revue canadienne de l'éducation, 31*(4), 941-974.

Mwebi, B., & Brigham, S. (2009). Preparing North-American pre-service teachers for global perspectives: An international teaching practicum experience in Africa. *Alberta Journal of Education, 55*(3), 415-428.

Pence, H. M., & MacGillivray, I. K. (2008). The Impact of an international field experience on preservice teachers. *Teaching and teacher education, 24*(1), 14-25.

Pohan, C. (1996). Preservice teachers' beliefs about diversity: Uncovering factors leading to multicultural responsiveness. *Equity and Excellence in Education, 29*(3), 62-69.

Sacks, O. (2010). *The mind's eye*. New York, NY: Alfred A. Knopf.

Schon, D. (1987). *Educating the reflective practitioner*. San Francisco, CA: Jossey-Bass.

Sleeter, C. (1995). An analysis of the critiques of multicultural education. In J. Banks & C. A. Banks (Eds.), *Handbook of research on multicultural education* (pp. 81-94). San Francisco, CA: Jossey-Bass.

Somerset, A. (2007). *A preliminary note on Kenya primary school enrolment trends over four decades.* Brighton, UK: University of Sussex.

Stachowski, L. (2001). Enhancing international student teaching experiences. *Education, 112*, 347-351.

Stuart, C., & Thurlow, D. (2000). Making it their own: Preservice teachers' experiences, beliefs, and classroom practices. *Journal of Teacher Education, 51*(2), 113-121.

Thiong'o, N. w. (1977). *Petals of blood*. London, UK: Heinemann.

Thomas, D.R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation, 27*(2), 237-246.

Tice, T. (1992). Student teaching abroad. *Education Digest, 58*(2), 39-45.

Villegas, A. M., & Lucas, T. (2002). Preparing culturally responsive teachers: rethinking the curriculum. *Journal of Teacher Education, 53*(1), 20-32.

Walsh, S., & Brigham, S. (2007). *Internationally educated teachers and teacher education programs: Current practices.* Report prepared for the Atlantic Metropolis Centre, Halifax, NS. Retreived from Atlantic Metropolis website http://www.atlantic.metroplois.net/index-e.html

Wheeler, A. H. (1985). *Beyond the crossroads: Charting the future.* Cape Girardeau, MO: Southeast Missouri University Press.

Willard-Holt, C. (2001). The Impact of short-term international experience for preservice teachers. *Teaching and Teacher Education, 17*, 505-517.

Williams, A.M., & Irurita, I.F. (1998). Therapeutically conductive relationships between nurses and patients: An important component of quality nursing care. *Australian Journal of Advanced Nursing, 16*(2), 36-44.

Williams, L., & Kelleher, R. (1987). International student teaching: Linkage for change. *Innovative Higher Education, 11*(2), 84-93.

Wilson, A.H. (1993). Conversation partners: Helping students gain a global perspective through cross-cultural experiences. *Theory into Practice, 31*(1), 21-27.

Wilson, A.H. (2001). Growing towards teaching from a global perspective: An analysis of secondary social studies pre-service teachers. *The International Social Studies Forum, 1* (2), 127-144.

Worger, W. H., Clark, N. L., & Alpers, E. A. (2010). *Africa and the West: From colonialism to independence, 1875 to the Present*. Oxford, UK: Oxford University Press.

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LISTENING TO THE STUDENT VOICE: UNDERSTANDING THE SCHOOL-RELATED FACTORS THAT LIMIT STUDENT SUCCESS

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ABSTRACT. Literature on social inequalities in schooling reveals that the school curriculum, streaming, and teacher expectations are school-related factors that limit student success. This study asks: How do the school curriculum, streaming and teacher expectations limit students who have been designated "at risk" from finding success in school? Quantitative and qualitative data showed that the curriculum does not meet all students' needs, streaming diminishes learning, and low teacher expectations limit student success. Student self-blame and meritocracy are other factors found to limit student success.

ÉCOUTER LA VOIX DE L'ÉLÈVE : COMPRENDRE LES FACTEURS SCOLAIRES LIMITANT LE SUCCÈS DE L'ÉLÈVE

RÉSUMÉ. La littérature traitant des inégalités sociales à l'école révèle que les programmes scolaires, la répartition des élèves par niveaux et les attentes des enseignants constituent des facteurs scolaires limitant le succès des élèves. Cette étude pose donc comme question : de quelle manière les programmes, la répartition des élèves par niveaux et les attentes des enseignants empêchent-ils les élèves ayant été désignés comme « à risque » dans leur succès en milieu scolaire? Les données quantitatives et qualitatives montrent que les programmes ne rencontrent les besoins de tous les élèves, que la répartition des élèves par niveaux diminue les apprentissages et que des attentes basses de l'enseignant limitent le succès à l'école. Le sentiment de culpabilité de l'élève et la méritocratie sont d'autres facteurs relevés comme limitant le succès des élèves.

In Canada and many other countries, student disengagement has been recognized as a problem since the turn of the twentieth century. Here in Ontario, Canada, reviews of public education including the Hope Commission in 1950, the Hall-Dennis Report of 1968, the Secondary Education Review Project in 1982 (Green, 1982), the Radwanski Report of 1987, the Royal Commission of Learning in 1995, and the Double Cohort Study by Dr. Alan King (2004) have acknowledged the problem of student disengagement. Radwanski's report

(1987), for example, concluded that the education system had become irrelevant, students lacked appropriate skills and knowledge for today's economy, and that many students were uninterested in what they were being taught at school. King (2004) found that only fifty percent of high school students go to university or college while the remaining fifty percent of students enter the work force with or without an Ontario Secondary School Diploma. Schooling has been reported again and again to not be meeting the needs of all students. This is because:

1. The school curriculum is insufficiently comprehensive for many of today's learners. It is predominantly an academic curriculum for the minority of students who are university bound. Students who feel that the curriculum is not relevant to their lives are more inclined to disengage in school (Allensworth & Easton, 2007; Bridgeland, Dilulio, Morison, 2006; Hammond, Linton, Smink & Drew, 2007; King, 2004);

2. Streaming (or ability grouping) of students has been associated with many negative effects in schooling and is often to the detriment of students who are placed in the lower streams (Curtis, Livingston & Smaller, 1992; Gamoran, Nystrand, Berends, & LePore, 1993; Mac Iver & Mac Iver, 2009; Oakes, 2004);

3. Teacher expectations limit student success in school. Lowered expectations of students in the "lower" (applied) stream by teachers and administration often lead to lack of encouragement and diminish the likelihood of these students from finding success in school (Croninger & Lee, 2001; Dei, Mazzuca, McIsaac, & Zine, 1997; Good & Brophy, 2000; Lyche, 2010).

Stemming from the research on social inequalities in school, this study asks: how do the school curriculum, streaming, and teacher expectations limit students in the applied streams who have been designated "at-risk" from finding success in school? This study's objective is to gain an initial understanding of students' perceptions and attitudes about the factors that influence their success (credit achievement) at school.

OVERVIEW OF THE STUDY

This study grew out of my work as an educator who teaches students who are disengaged in school and who have not experienced success. I was specifically interested in hearing the voices of the students who have been labeled as "at-risk" by the school they attend. At-risk students are students who are struggling in school and are at risk of not graduating from high school. They match one or more of the following criteria: failed two or more classes in a semester, have behaviour problems, or have been classified by a teacher as students who have and/or are currently struggling to find success within school. These students were generally found in the applied stream in secondary school.

Both quantitative and qualitative research was carried out for this study. First, a survey was made available to all one hundred and seven of the at-risk candidates at one high school, in Ontario, Canada during the 2007-2008 school year. Sixty-one students completed the survey. Both open- and close-ended questions were asked in the survey to gain an understanding of how the curriculum, streaming, and teacher expectations affected their success in school. Second, semi-structured interviews were conducted with four at-risk students. The participants that were chosen reflected different backgrounds (e.g. race, gender, age, and socio-economic status) and different success rates in school. These four students were also asked questions about how the curriculum, streaming, and teacher expectations affected their success, or lack thereof, in school.

The theoretical framework that this study was situated in is critical theory, or what is also known as critical pedagogy. Critical theory seeks human emancipation, "to liberate human beings from the circumstances that enslave them" (Horkheimer, 1982, p. 244). Critical theorists ask *whose* knowledge it is that students learn and *why* it is organized and taught in a particular way. Critical pedagogy takes this a step further to consider how education can provide individuals with the "tools to better themselves and strengthen democracy, to create a more egalitarian and just society, and thus to employ education in a process of progressive social change" (Kellner, 2000, p. 3). Critical pedagogy is also an educational approach that attempts to help students question authority and to challenge the beliefs and practices that prevail, such as meritocracy. Meritocracy is founded on the belief (or rather myth) that success and progress in society is based on ability and talent rather than on class privilege or wealth. By calling attention to the inequalities that exist in the educational system, critical pedagogy theorists and educators hope to eliminate them.

This study is relevant within the current educational focus on school reform. Both provincially and internationally there is an aim to increase the success of all students in secondary school. While the voices of policy makers and educators are often heard in this process, the voices of students are often disregarded. Perhaps listening to the voices of those students who have not found success in school may shed new light on this topic.

LITERATURE REVIEW

In Canada and the US, the curriculum to a large extent has been and continues to be an academic, university preparation curriculum (Montgomery, Allensworth & Correa, 2010; Royal Commission on Learning, 1995). Schools have traditionally operated in what Durkheim (1977) called the conservation of the past. While there are many different realms of knowledge in this world, only a certain portion is selected for the school curriculum. Through learning the formal school corpus, students realize that their familial knowledge corresponds

or does not correspond to school knowledge. For many students, what the school considers legitimate knowledge bears little resemblance to the actual life of their parents, friends and their part-time jobs (Apple & Beyer, 1983). Furthermore, within these university preparation curricula, there traditionally has been little room for the student to construct, create, and actively inquire (Cohen, 1990; Dewey, 1959; Smith & O'Day, 1990). Schools have rarely acknowledged the educational research that supports the fact that people learn best when they can build on their experiences (Darling-Hammond, 2005). Schools also have not often acknowledged that student choice has been found to be a critical ingredient in student engagement. Findings from the Chicago Public Schools found that the relevance of classroom instruction to their perceived future was key to students staying in school (Allensworth & Easton, 2007). Relevant education leads to student engagement and motivation, which keeps students in school (Bridgeland et al., 2006). Making school more relevant and interesting keeps students engaged, it increases their attendance, and the likelihood of them staying engaged in school (Hammond et al., 2007).

Streaming is a second factor that leads to student disengagement in school. Streaming is a process that is based on the assumption that students learn better when they are grouped with other students with similar academic ability. Streaming is also based on the assumption that grouping students based on intellectual ability enables students to have positive attitudes about themselves and school. While streaming and the assumptions that it is based on may seem logical, research evidence does not support this practice. Instead, research has found that streaming largely perpetuates social inequalities, which affects how students perform in school (Curtis, Livingstone, & Smaller, 1992; Mac Iver & Mac Iver, 2009; Oakes, 2004).

Research literature addresses many negative outcomes of streaming. The first negative effect of streaming is the undesirable peer structures created in low-track classes. This leads to discouragement and alienation, and it creates disengaged learning environments for students in the lower streams (Curtis, Livingtone, & Smaller, 1992; Gamoran et al., 1995; Mac Iver & Mac Iver, 2009). The second negative effect is that streams tend to be permanent. Research shows that there is little movement from one track to another once initial assignments have been made and the movement that does occur tends to be downward (Oakes, 2004). The third negative effect of streaming is that students in the different streams receive different curricula. Researchers (Good and Brophy, 2000; Oakes, 2004) found that teachers in the lower streams focus on simple memory tasks, comprehension, and basic literacy skills. The fourth negative effect of streaming is that classroom environments tend to vary between streams. Applied classes are more likely to provide little choice and emphasize student conformity: students getting along with one another, working quietly, improving study habits, and conforming to classroom rules and expectations, all of which often lead to a negative school experience (Oakes,

2004; Ramsey, 1989). The final negative effect of streaming is teacher attitude and expectation. This will be discussed in greater detail below.

Teacher expectations, while recognized as an important aspect of education, are often overlooked as an integral component of why students do or do not find success in school (Good & Brophy, 2000). Teachers' expectations are "inferences that teachers make about the future behaviour or academic achievement of their students, based on what they know about these students now" (Good & Brophy, 2000, p. 116). In teachers' everyday interactions with students, they are guided by their beliefs about what students need and how students will respond to certain types of treatment.

Teacher expectations and behaviours can be positive and affect student achievement. Allensworth and Easton (2007) found that students' course performance was related to student relationships with teachers. Students are less likely to be disengaged with school where they experience high levels of trust for their teachers; feel teachers are helpful and motivating, and provide personal support to them. When students feel they are cared about, are treated fairly and with respect, they experience more success in, and are more satisfied with school (Croninger & Lee, 2001; Hammond et al., 2007; Radwanski, 1987). However, students who leave high school prior to graduation often cite a lack of social and academic support as one reason for doing so. They do not feel a sense of belonging in school; feel disconnected from teachers; and sometimes complain that their teachers do not care about them, are not interested in how well they do in school, and are unwilling to help with the problem (Croninger & Lee, 2001; Sinclar, Christenson, Lehr, & Anderson, 2003). Students who experience low teacher expectations may internalize negative perceptions of themselves and self-blame for their performance in school. Self-blame attributions include poor motivational orientations, lower levels of self-worth, and lower ratings of importance of academic success, scholastic competence and hopefulness (Johnson, 1993; Simon, 1991).

In summary, this study asks: how do the school curriculum, streaming and teacher expectations limit students in the applied streams who have been designated "at-risk" from finding success in school? The review of the literature indicates that school curricula limit student engagement as they are not relevant to many students' lives. Streaming is a detriment to many students as it has been found to create undesirable peer structures in low-track classes, permanence within streams, requires less intelligence, and fosters lower teacher attitude and expectation. Lastly, teacher expectations are found to limit student success in school. While positive expectations are noted to be effective in enhancing student success, caring relationships and high teacher expectations are less likely to occur in low-ability classes. In return, students often internalize negative perceptions of themselves and self-blame for their lack of success in school.

METHODOLOGY

This study took place during the 2007-2008 school year in a mid-size secondary school in Ontario, Canada. Westview High School (a pseudonym) has an enrollment of approximately eight hundred and fifty students and is located in an urban environment in southwestern Ontario. The school is located in an upper class neighbourhood, although Westview High School's geographic boundary includes all socio-economic backgrounds.

Both quantitative and qualitative research was conducted. Quantitative studies survey a sample of the population to grasp a broader perspective while qualitative research allows the researcher to have close contact with participants in order to give a voice to their feelings and perceptions. This was seen as important as both research methods help to provide a holistic picture of why students do not find success in school. The combination of methods also strengthens data dependability and transferability.

All participants in the study were classified as at-risk by Westview High School administration. Some of the at-risk students are in the credit recovery program. This program helps students earn the credits they have previously failed to achieve, while developing the learning skills needed for academic success.

Participants were informed of the study by Westview High School's administration, who were fully supportive of the study. Details of the study were outlined in the letter of information and participants were asked to read the informed consent letter. At this time, the students had the opportunity to have any questions answered. They were also asked to take the consent letter home to be signed by their parents/guardians and to return the signed consent letter. The survey took place two days later. Only those sixty-one students who had their consent letter signed participated in the survey. The students who participated in the semi-structured qualitative interviews were recruited with the same courtesies as those who participated in the survey; they attended the information session and were requested to return the consent letter. However, their recruitment was slightly different. They were asked individually by me if they would be willing to participate in the study after the consent forms were returned. Upon agreement, I arranged an interview time that was mutually convenient. These students were chosen from a variety of backgrounds, gender, grades, socio-economic status, and present success in school to ensure purposeful sampling.

The survey contained thirty-two open and close-ended questions in order to gain an understanding of how the curriculum, streaming, and teacher expectations affect their success in school. The program-wide questionnaire was administered to reflect general trends, support the qualitative research findings, and provide a wider understanding of student success issues. Survey data were analyzed using an Excel spreadsheet. The semi-structured interviews were conducted with four at-risk students. The interviews consisted of twenty-eight questions

with the intent of gaining an understanding of how the curriculum, streaming and teacher expectations affect their success in school. The participants that were chosen reflected different backgrounds (race, gender, age, and socio-economic status) and different success rates in school. One student was finding success in school, (i.e. passing all courses), two were continuing to struggle to obtain all their credits each semester, and one left school as the study commenced. The interviews took place at an appointed time that met with approval of the students. All the interviews were transcribed verbatim, coded according to a priori and emergent codes, and analyzed using MAXqda2 computer software.

DATA ANLYSIS / FINDINGS

Survey participants were asked to state their demographic information. Approximately one-third of the sixty-one survey participants were fourteen years of age, one-third were fifteen years of age, and the remaining third were sixteen years or older. Almost three-quarters (69%) were in grade nine. Almost two-thirds (61%) of the respondents were female. Seventy percent of the student participants in this study took all their courses in the applied stream; thirty percent took some academic courses in addition to the applied courses. All students in this study were struggling academically in school.

There were four participants in the semi-structured interviews, all of whom were taking applied level courses. The first interview participant was Lisa (pseudonyms are used for all participants). Lisa was a 16 year old female in grade 10. She was a strong, outspoken student who had a great sense of humour and laughed a lot. She was barely obtaining her credits in school.

The second interview participant was Steven. Steven was a 17 year old male in grade 11. He was a kind, friendly student who clearly knew what he must do to be successful, yet he was failing many of his classes in school.

The third interview participant was Joe. Joe was a 16 year old male in grade 11. Joe was very open and honest in describing his family life, which was filled with violence and illegal activity. Joe was a kind-hearted individual who wanted to do well in school, but found his personal life distracting. He was failing all his courses.

Interview participant four was Sarah. Sarah was a 16 year old female in grade 11. Sarah was a kind, positive student who sincerely wanted to do well in school. While she struggled to find success in school after the death of her mother, she was presently passing all her classes with her marks ranging from 60% to 80%.

School curriculum

Questions regarding the school curriculum were asked first. Participants were asked if they found the curriculum interesting, reflected their interests, and relevant to their present life and future career. 33% of the survey participants stated that they were interested in what they were learning in class. The activities that reflect their interests included media arts, basketball, reading and hands on activities. Due to the class not being particularly interesting, the majority of the survey participants (59%) stated that the effort they put into school consists of listening to the teacher. Less than half (40%) stated that they complete their assignments, and 31% stated that they participate in course discussions.

All four interviewees felt that their courses were interesting sometimes, but their interest was directly related to the information that they could use in their lives and future career. For example, Lisa stated that her classes were only a "little bit" interesting because, she felt that "some of the things are stupid, you're just never going to use them again." I don't plan on measuring angles in my life," she added. While she did understand how math was valuable for her cashier job and basic everyday duties, she found other tasks uninteresting and unrelated to her interests.

Participants were also asked if their classes were worthwhile to their future or present lives. Only half (48%) of the participants thought what they learned in school will be worthwhile to their future. However, 41% of the survey participants felt that school is one of the most important things in their life, while the same percentage of participants stated that most of the time they would like to be anywhere else than school. The reasons listed by the survey participants that make a class worthwhile included: the class or the teacher being fun and/or interesting, and class being relevant to their everyday lives/future. Two interview participants also stated that they felt teachers had a large impact on the interest level of the class. Sarah claimed that "if a teacher is sitting there droning out the same things and you try to ask for help and they still explain it in the same way they just did," class is not interesting.

The last question regarding the school curriculum was whether the information students learned in school was relevant to their everyday life. The majority (67%) of survey participants stated that they used it only sometimes or never at all. All four interview participants also stated that they rarely, if at all, used the information learned at school in their everyday lives. Lisa stated that she only used math in her cashier job, and Joe stated that he used woodworking and science for his hobbies. However, Joe, while occasionally using school information for his hobbies, lacked the understanding of how school knowledge would help him when confronting non-school related issues in his personal life, such as having to deal with "the crackheads in the neighbourhood [because] once they figure out you are not home they will

go break in your house". He did not feel school prepared him for what he confronted in his every-day life.

Streaming

Streaming is the practice in education of placing students into groups or classes based on their perceived abilities, talents, or previous achievement. In the survey, students were asked who choose their stream, their beliefs about changing streams, and their future options based on streaming. 80% of the survey participants stated that they chose their stream, although 28% of these participants stated that they decided with a parent, teacher or guidance counselor. All interview participants stated that guidance counselors and parents chose their stream, although half of them felt that they were part of the decision.

Participants were asked if they felt they had the ability to change streams. 87% of the survey participants and three interview participants stated they believed they could change streams in at least some of their courses, even though they knew that more work would be required. Yet, according to these interviewees, putting more effort into school is not desired. For example, Steven stated that if he was put into academic classes he would "fail automatically right there, cause, [he] just [does not] do work. So [he] just takes applied [courses].... It is easier, not a lot of work." Lisa reiterated this when she stated that she felt that students choose applied classes "because kids just do not care... they just get by, just under the bar, and that's it." Lisa felt that while students could do better, they did not have an interest in doing so.

While most of the students in the applied stream believed they could change streams, approximately two-thirds (65%) of survey participants and all interview participants stated that being in the applied stream gave them fewer future options some or all of the time. As Steven stated:

> Applied level students can't decide between university or college, they have to go to college. You can't decide what you want to be; you're basically told you have to do this stuff or that, that's all that's offered here.

Sarah agreed that applied classes have fewer options, but stated she was taking applied classes because:

> I was doing a lot of bad things at the time...I was drinking and doing drugs and I just didn't care about anything...I was really depressed because my mom had passed away and I just didn't know what to do with myself.

Sarah felt that her choice, even though it would give her fewer options, was self-imposed. She blamed herself for failing courses and not working hard enough to be placed in the academic stream.

Students were also asked if applied classes have more behavioural problems than academic classes. The majority of the survey participants (61%) stated that

there are more behaviour problems, at least some of the time. Three out of four interview participants agreed. Lisa addressed this issue when she stated:

> Some applied students like to misbehave and stuff so they take applied because it is easier. You learn what you need to know but it's learned easier and quicker... If you're put in an academic class, it's constantly learning and learning and learning. So [applied students] are just there trying to take the easy way out because they'd rather like to skip school or not be in class or try to do nothing. And when they think this is too easy, they start misbehaving.

Lisa felt that due to the lack of difficulty in school-work, behavioural problems erupt in the applied classes. Joe believed that there are more behaviour problems in applied versus academic classes because teachers expect applied students to misbehave:

> ...a lot of the kids in applied classes are more hyper. They are used to being told that they're bad. Like I know if I am told I am bad and shit I am purposely going to turn around and be bad. I do it just like if someone tells me I'm being bad I am going to purposely do it just to piss them off.

Joe believed that when teachers assume there will be more behavioural problems in applied classes, applied students will meet that expectation. Further findings about teacher expectations are addressed next.

Teacher expectations

Students were first asked if they felt that their teachers had high expectations of them. Almost all survey participants (92%) and three of the four interviewees felt that teachers either had high expectations all or some of the time, and that this made a difference. As Sarah stated:

> ...if there is somebody going "I know you can do this" you are going to be like "ya I can do this" but if there are teachers staring at you and you are like "I can't do this" and they never put the encouragement into you that you can, you are not going to.

She believed, like many others, that there were teachers who had high expectations of her. Furthermore, when students were asked in an open-ended question why they did not pass their classes, almost 85% of the participants referred to self-imposed reasons: not handing in all their work, having failed an exam or having been absent from the exam, not paying attention, and being absent from school. Interview participants stated they failed because they are either lazy, do not listen, or are misbehaving, so they do not feel that a teacher would believe in them given their own behaviour. Only 20% believed that failing a course had anything to do with a teacher or a teacher's expectation.

Nevertheless, while the majority of participants believe teachers have high expectations and their lack of success is self-inflicted, 83% of the survey participants believe that teachers have higher expectations of academic students

than applied students at least some of the time. Seventy percent and all interview participants also felt there was unequal treatment between applied and academic students. The reasons given were: academic students have more freedom, they receive more respect and higher expectations from teachers, teachers talk to applied students like they are "stupid" compared to the academic students, teachers ask applied students less challenging questions in class, or teachers ignore applied students completely when they are speaking. Interview participants also felt that teachers are more respectful to academic students, they are nicer to them and they treat academic students as though they are superior.

DISCUSSION

In analyzing the data pertaining to the school curriculum, streaming and teacher expectations, a number of themes arose. First, the curriculum was uninteresting to the majority (66%) of the students in this study. The few school related activities that they claimed reflected their interests included media arts, basketball, reading, and hands-on activities. Over half (52%) found the school curriculum irrelevant to their future lives, and 67% stated that they used school knowledge only some of the time or not at all in their present life. While 41% of the survey participants felt that school is one of the most important things in their life, the same percentage of participants stated that most of the time they would like to be anywhere else than school. Simply put, school is not interesting or relevant to their lives. These findings are not new. Numerous reviews of public education, including the Radwanski Report of 1987 and the Dr. Alan King Study of 2004, have acknowledged this problem that the school system is not meeting the needs or interests or is relevant in the lives of at least half of the student population in Ontario. This appears to be true in this study as well.

Second, as indicated in the literature and as illustrated in this study, low stream classes had more behavioural problems, a negative classroom atmosphere, and low motivation. For example, 61% of the surveyed students and three of the interviewees stated that there are more behaviour problems in applied courses as compared to academic classes. 87% of the survey participants and three interview participants stated they could change streams in at least some of their courses, but putting more effort into school is not desired "because kids just do not care... they just get by, just under the bar, and that's it" (Lisa). The literature on this topic reports similar findings. Due to the classroom climate, low academic stream students often have lowered self expectations where students are often frustrated and play a disruptive role and where teachers have preconceived ideas and expectations of students (Antonelli, 2004; Oakes, 2004; Rosenthal, 1991). The data from this research study supported this finding with Joe's statement that applied students are regularly told that they're bad, and with this expectation they often purposely try to be bad. He believed, as

the research suggests, that there are more behaviour problems in low stream classes because teachers expect these students to misbehave.

Third, teacher expectations played a role in the success of students in this study. While 92% and three interviewees believed that teachers had high expectations of them all or some of the time, 83% believed teachers had higher expectations of academic students by giving them more respect, more attention, and more challenging work. Teachers typically teach both applied and academic students, which is why this finding is particularly significant - the students see the teachers' expectations change depending on the students they teach. While there is research on the differential treatment of students and the impact this has on student academic success (Mac Iver & Mac Iver, 2009; Oakes, 2004), Babad (1993) found that teachers are generally unaware of the negative messages communicated to students. Teachers tend to believe that they are emotionally supportive of low-achieving students. Yet, teachers, although concerned about their students, are not optimistic about their futures. Many teachers are more concerned with monitoring student work and behaviour rather than creating a community with a broad range of activity (Good & Brophy, 2000). This often leads to a lack of a sense of belonging and often a lack of success in school (Croninger & Lee, 2001; Sinclar et al., 2003).

Fourth, it is important to note that while the majority of the study participants found the curriculum uninteresting and not relevant to their lives most of the time, many blamed themselves for their failure in school. They believed (85%) that they were to blame for not handing in all their work, not paying attention, and being absent from school, and generally not finding success in school. The majority also blamed themselves for picking their stream (80%), despite the belief they could change streams in at least some of their courses (87%), and despite believing the applied stream would give them fewer options for their future (65%). They even stated that they chose the applied stream, despite feeling that teachers believe in academic students more (83%) and treat academic students more fairly (70%). Yet, few (20%) blamed teachers, the curriculum, or any other school-related factors at all. Eighty percent of students surveyed and all interviewees blamed no one but themselves for their lack of success in school. With this belief, it would seem that these students reflect consistent trait-like attributions of self-blame. As indicated above, self-blame attributions include poor motivational orientations and lower ratings of academic success (Johnson, 1993; Simon 1991). In this study, students also displayed poor motivation and low academic success, despite believing that they could do better and that the choices they were currently making would offer fewer future options.

However, while self-blame seems to play a role in the students' lack of success, it may not be the only or true culprit here. The idea of meritocracy or the belief that success is based on talent and ability and not on social class or

wealth may be a more significant factor. Students, often unaware, internalize the school and school system. These students do not question whose knowledge they learn or why schooling is organized and taught in a particular way. The inequalities that exist in the school system are not addressed or even recognized. Instead, students believe that success is based on talent and ability and that they are to blame for their choices and their success or lack of success in school. Yet, the way the school system is organized, many choices may have already been made for them. For example, the school curriculum does not reflect many interests or future career of at-risk students, who typically have low socio-economic status. The school system is organized into streams, and with teachers' lowered expectations of low stream students, students behave and are streamed into courses that often seems like a natural choice - especially if they blame themselves when they do not illustrate the necessary work ethic, talent or ability. Within the low stream school environment, typically characterized by lowered expectations, negative classroom atmosphere, student behavioural problems, and low student motivation, many at-risk students do not find success in school. Yet, rather than seeing or understanding the barriers that are hindering their success in school, students blame themselves. Students are not given the tools, awareness or voice to question authority and challenge the beliefs and practices that prevail, as critical pedagogy aims to do. Instead, fueled by low self-concept, many students in this study seem to have bought into the idea of meritocracy and blame themselves for their lack of academic success.

CONCLUSION

In summary, the school curriculum is not relevant or interesting to at-risk students' lives. Streaming creates negative classroom environments with many behavioural problems and lower student motivation. Teacher expectations, while key to student success, were perceived to be much higher for high stream students than low stream students. Student self-blame and meritocracy are other factors found to limit student success in school. As indicated above, these findings are not new. Five decades of educational research has proven again and again the barriers to student success (Rumberger 1987; Sinclair et al., 2003). Yet little change has occurred in schools. The curriculum, streaming, and teachers expectations largely remain unchanged.

However, perhaps through the critical pedagogy approach, which was the conceptual lens for this study, schools can work to eliminate inequalities in the school system. In order to do this, schools and educators need to discard old assumptions about how students experience secondary school. There is a need to view the students' educational experience as evolving both within and outside of the school. Such a perspective suggests that schools start with what students know and use, and to celebrate this knowledge by building upon it with diverse educational experiences. A deep restructuring that draws up a

vision where all human potential flourishes within a positive social environment can occur. The kinds of changes that are needed will take place only when we begin to view the school as a complex system in which every decision has long-term implications. This, I realize, will take many years to unfold. Nevertheless, I believe that with time and dedicated purpose it is possible.

REFERENCES

Allensworth, E., & Easton, J. (2007). *What matters for staying on-track indicator and graduating in Chicago public high schools*. Chicago, IL: Consortium on Chicago School Research.

Antonelli, F. (2004). *From applied to applause: An OSSTF research project on improving student success in applied level courses*. Toronto, ON: University of Toronto.

Apple, M. W., & Beyer, L. E. (1983). Social evaluation of curriculum. *Educational Evaluation and Policy Analysis, 5*(4), 425-434.

Babad, E. (1990). Measuring and changing teachers' differential behaviour as perceived by students and teachers. *Journal of Educational Psychology, 28*(4), 683-90.

Bridgeland, J. M., Dilulio, J. J., & Morison, K. B. (2006, March). *The silent epidemic: Perspectives of high school dropouts*. Washington, DC: Civic Enterprises, LLC, in association with Peter D. Hart Research Associates for the Bill & Melinda Gates Foundation.

Cohen, D. (1990) A revolution in one classroom: The case of Mrs. Oublier. *Educational Evaluation & Policy Analysis, 12*(3), 327-345.

Croninger, R. & Lee, V. (2001). Social capital and dropping out of high school: Benefits to at-risk students of teachers' support and guidance. *Teachers College Record, 103*, 548-581.

Curtis, B., Livingstone D. W., & Smaller, H. (1992). *Stacking the deck: The streaming of working-class kids in Ontario schools*. Toronto, ON: Our Schools/Our Selves Education Foundation.

Darling-Hammond, L. (2005). Educating the new educator: Teacher education and the future of democracy. *New Educator, 1*(1), 1-18.

Dei, G. J. S., Mazzuca, J., McIsaac, E., & Zine, J. (1997). *Reconstructing "drop out:" A critical ethnography of the dynamics of black students' disengagement from school*. Toronto, ON: University of Toronto Press.

Dewey, J. (1959). *Dewey on education selections*. New York, NY: Teachers College Press.

Durkheim, E. (1977). On education and society. In J. Karabel and H.H. Halsey (Eds.), *Power and ideology in education* (pp. 92-104). New York, NY: Oxford University Press.

Gamoran, A., Nystrand, M., Berends, M., & LePore, P. (1995). *An organizational analysis of the effects of ability grouping. American Educational Research Journal, 32*(2), 687-715.

Good, T. L., & Brophy, J. E. (2000). *Looking in classrooms* (8th ed.). New York, NY: Longman.

Green, D. (1982). *Secondary education review project*. Toronto, ON: Ontario Ministry of Education.

Hall, E.M.; Dennis, L.A. (1968). *Living and learning: The report of the provincial committee on aims and objectives of education in the schools of Ontario*. Toronto, ON: Ontario Ministry of Education. Retrieved from http://www.connexions.org/CxLibrary/Docs/CX5636-HallDennis.htm

Hammond, C., Linton, D., Smink, J., & Drew, S. (2007). *Dropout risk factors and exemplary programs*. Clemson, SC: National Dropout Prevention Center, Communities in Schools, Inc.

Horkheimer, M. (1982). *Critical theory*. New York, NY: Seabury Press.

Johnson. E. (1993, March). *The relationship of self-blame and responsibility attributions and motivations, for schoolwork and conduct, to self-worth and self-perceptions*. Paper presented at the 60th Biennial Meeting of the Society for Research in Child Development, New Orleans, LA.

Kellner, D. (2000). Multiple literacies and critical pedagogies. In P. Pericles Trifonas (Ed.), *Revolutionary pedagogies – Cultural politics, instituting education, and the discourse of theory* (pp.1-15). New York, NY: Routledge.

King, A. (2004). *Double cohort study: Phase 3 report*. Toronto, ON: Ontario Ministry of Education.

Lyche, C. (2010). *Taking on the completion challenge: A literature review on policies to prevent dropout and early school leaving* (OECD Education Working Papers, No. 53). Retreived from http://dx.doi.org/10.1787/5km4m2t59cmr-en

Mac Iver, D. J., & Mac Iver, M. A. (2009). *Beyond the indicators: An integrated school-level approach to dropout prevention*. Arlington, VA: The George Washington University Center for Equity and Excellence in Education.

Montgomery, N., & Allensworth, E. & Correa, M. (2010). *Passing through science: The effects of raising graduation requirements in science on course-taking and academic achievement in Chicago*. Chicago, IL: Consortium on Chicago School Research at the University of Chicago Urban Institute.

Oakes, J. (2004). *Keeping track: How schools structure inequality* (2nd ed.). New Haven CT: Yale University Press.

Radwanski, G. (1987). *Ontario study of the relevance of education, and the issue of dropouts*. Toronto, ON: Ministry of Education.

Ramsey, P. G. (1989). *Teaching and learning in a diverse world* (3rd ed.). New York, NY: Teachers College Press.

Rosenthal, R. (1991). Teacher expectancy effects: A brief update 25 years after the Pygmalion experiment. *Journal of Research in Education, 1*(1), 3-12.

Royal Commission on Education. (1950). *Report of the Royal Commission on Education in Ontario* (J.A. Hope, chair). Toronto, ON: B. Johnston, Printer to the King.

Royal Commission on Learning. (1995). *For the love of learning*. Ottawa, ON: Queens Printer for Ontario.

Rumberger, R.W. (1987). High school dropouts: A review of issues and evidence. *Review of Educational Research, 57*, 101-121.

Simon, A. (1991). Reasons provided by black pupils in rural Mahlabathini area in Natal Province, South Africa, for poor academic performance in black secondary schools. *Journal of Negro Education, 60*(4), 581-92.

Sinclair, M. F., Christenson, S. L., Lehr, C. A., & Anderson, A. R. (2003). Facilitating student engagement: Lessons learned from check & connect longitudinal studies. *The California School Psychologist, 8*(1), 29–42.

Smith, M., & O'Day, J. A. (1990). Systemic school reform. In S. Fuhrman & B. Malen (Eds.), *The politics of curriculum and testing* (pp.233-367). London, UK: The Falmer Press.

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A CULTURAL PERSPECTIVE OF CONCEPTUAL CHANGE: RE-EXAMINING THE GOAL OF SCIENCE EDUCATION

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ABSTRACT. The goal of science education is usually meant to develop students' basic knowledge, skills, and scientific attitudes as stated in many countries' curriculum documents, with little consideration of what backgrounds students bring into the classroom. A cultural approach to education has challenged this universal goal of science education. This paper provides a cultural analysis of conceptual change and recommends an argument approach to teaching for conceptual advancement. It argues that the outcome of classroom discourse cannot be oriented to be a replacement of students' intuitive conceptions with scientific notions, rather coexistence between scientific understanding and culture/experience-based views is considered to be a more reasonable and realistic goal.

UNE PERSPECTIVE CULTURELLE DES CHANGEMENTS CONCEPTUELS: RÉEXAMINER LE BUT DE L'ENSEIGNEMENT DES SCIENCES

RÉSUMÉ. Le but de l'enseignement des sciences, tel que défini dans les programmes d'enseignement de plusieurs pays, est habituellement de développer les connaissances de base, compétences et attitudes scientifiques des élèves et ce, sans égard pour leur savoir préalable. Une approche culturelle à l'enseignement a bouleversé ce but universel de l'enseignement des sciences. Cet article analyse sur une base culturelle le changement conceptuel et recommande une approche argumentaire comme méthode éducative favorisant l'évolution conceptuelle. L'auteur y avance que les résultats des débats faits en classe ne peuvent être orientés pour reprogrammer les conceptions intuitives des élèves par des notions scientifiques. En fait, Zhou soutient qu'un but sensé et réaliste est une cohabitation de la compréhension scientifique et des points de vue personnels et culturels sur la science.

Born and raised in the countryside of China, my childhood was full of ghost stories. I heard of them from my parents, neighbors, relatives, and classmates. I still clearly remember one story my mother told me about 35 years ago. The story took place one late evening when a farmer passed by a graveyard on his way home. He suddenly got lost, and many ghosts appeared around him covering his eyes with hands, filling his mouth with dirt, and pulling him off the road by his clothes. He tried to escape, but ended up moving from one grave to another. He became so scared that he shouted loudly for help. People in the village came out beating drums and striking gongs to scare the ghosts away. Besides such oral stories, I learned about ghosts from books, radios, TV shows, and movies. There is one famous book entitled *Liao Zhai Zhi Yi*. It was originally completed over 300 years ago and recorded many ghost stories the author had collected. The book has been adapted to movies and children books.

I experienced ghost culture intensively during the Chinese New Year celebration, the Spring Festival. On the wall of our house hung a photo of my grandmother who passed away when I was in elementary school. On New Year's Eve, my parents placed food in front of the photo, burned paper money, and then kowtowed before the photo, murmuring in a hard-to-hear voice something like "collect your money," "take care," or "bless the family please!" On New Year's Day, my father always took my brothers and me to join a group that consisted of men from his brothers' and cousins' families. The group went to the family grave yard and performed the same ritual in front of the graves of our ancestors as what my parents did with the photo of my grandmother. During the Spring Festival, my parents, like other farmers, posted red couplets on their house doors with content varying widely from the blessing of good luck to praise of government policies. Why red? Red symbolizes happiness and prosperity in Chinese culture and farmers believe ghosts are afraid of the color red. Another common thing to do during the Spring Festival is to light firecrackers. Firecrackers are also thought to frighten away stray ghosts. In this kind of social and cultural environment, the concept of ghost was developed and rooted deeply in my mind. I would even turn back from time to time to check whether something was following me while I walked alone in the evening. I can still remember the Spring Festival when I lit firecrackers at every corner of our yard and, in the two vacant rooms of our house because I believed that stray ghosts tended to stay in quiet, dark, and remote areas.

When I entered into middle school, however, my biology teachers told me that ghosts did not exist and that everything ended after death. My Chinese language textbook included articles that stated the nonexistence of ghosts. I began to talk as an atheist, especially when I moved to the city for high school. I rarely heard and thought about ghosts in the city, and the concept of ghosts became blurry over time.

Even now, after many years of university education, including extensive academic training in science and professional experience in science education, this traditional knowledge about ghosts remains deeply embedded in me. In 1996, I visited my parents during a New Year's Day work break. One of my grandmothers had passed away that winter. I arrived at the village in an evening and wanted to visit this grandmother's family to offer my condolences for their loss. My mother and brother advised me to wait until the next morning considering the recent death and the understanding that ghosts were more active at night. I indeed waited till the next morning.

A reflection on my life journey with the concept of ghosts pushes me to question the effectiveness of education practices that aim to completely eliminate a person's views about something, particularly when these views are deeply rooted in his or her ethnic-racial culture. This inspired me to critically look at an important research topic in science education: conceptual change. A large volume of research over the last two decades of the 20th century has convincingly documented that students come into the classroom with their own ideas on many scientific topics (e.g. Driver, Guesne, & Tiberghien, 1985). However, the efforts to replace students' ideas with scientific notions have been reported to be very difficult in many cases (e.g. Clement, 1982). Cultural studies of science education since the late 1990s have examined student learning in cases where students' life-world culture clashes with the culture of Western science, and there has been an attempt to integrate indigenous knowledge into the Western-science dominated school curriculum (Aikenhead, 2006). These studies claim that the traditional science education works to effectively colonize students by assimilating them into the culture of Western science. This attempt at colonization largely fails since it makes many students feel alienated from science. Postcolonial thinking encourages one to ask such questions as how the topic of conceptual change can be viewed differently and what can be considered as the goal of science education. Some scholars (Aikenhead & Jedege, 1999; Jedege, 1995, 1997) have employed the notions of border crossing and collateral learning in order to describe the learning of Western science which is contradictory to indigenous knowledge. However, the literature still has gaps on such questions as to how the two contradictory knowledge systems are impacted by each other as a result of cross-cultural learning and what classroom practices would be appropriate to address this type of learning.

To tackle these important and timely questions, this paper starts with a critical review of conceptual change literature published in the past three decades, then goes on to discuss the pre-assumed goal of science education underlined in this literature. A postcolonial framework is used to deconstruct the past literature on conceptual change and propose a cultural approach to looking at this topic. Finally, this paper advocates for a new perspective about the goal of science education and recommends an argument approach to teaching for conceptual advancement with a belief that the instruction of scientific

models is incomplete without exposing students to the distinctions between the scientific and cultural ways of constructing knowledge claims.

"COLD" AND "WARM" MODELS OF CONCEPTUAL CHANGE

Students come to the school with their own understanding of the world (Driver, Guesne, & Tiberghien, 1985). Relevant literature has referred to students' ideas as "preconceptions" (Clement, 1982), "misconceptions" (Helm 1980), "naïve or intuitive ideas" (Osborne & Freyberg, 1985), "alternative frameworks" (Driver & Erickson, 1983), or "alternative conceptions" (Gilbert & Watts, 1983). Taking into consideration that students' conceptions are formed before receiving formal instruction in class, this paper will use the term "preconception." A plethora of studies have been conducted to identify preconceptions in numerous scientific content areas (e.g. Bar, Zinn, & Rubin, 1997; Bishop & Anderson, 1990; Clement, 1982; McCloskey, 1983). A common conclusion from these studies is that preconceptions are often at odds with scientific ideas and continue to persist following traditional instruction. The purpose of science teaching was therefore assumed to be a replacement of students' less acceptable conceptions by more sophisticated scientific concepts capable of accounting for phenomena where preconceptions were unable to do so. This replacement was called conceptual change.

"Cold" model

Scholars have proposed models and strategies to describe or facilitate teaching for conceptual change. One of the earliest and well-known conceptual change models came from Posner and his colleagues (Posner, Strike, Hewson, & Gertzog, 1982). Inspired by Kuhn's (1970) theory of scientific revolution, Posner and his colleagues stated that there were several cognitive conditions that must be fulfilled before any conceptual change can occur. These conditions could be briefly described in terms of students' dissatisfaction with the old conception and the intelligibility, plausibility, and fruitfulness of the new conception. This model attracted much attention from science educators. Most theoretical analyses and practical strategies for conceptual change constructed during the 1980s and 1990s were based on or closely related to this model (E. L. Smith, Blakeslee, & Anderson, 1993). For example, Nussbaum and Novick (1981) suggested a three step approach to promote conceptual change: (a) making children's alternative frameworks explicit to them, b) inducing dissatisfaction by presenting evidence that does not fit, (c) presenting the new framework and explaining how it can account for the anomaly. These proposed teaching strategies share a common process that involves creating cognitive conflict before providing a new framework (Hewson & Hewson, 1988).

Empirical studies which attempt to bridge the gap between a personally held concept and the scientific view, however, have generally revealed that preconcep-

tions are resistant to change (Clement, 1982). Studies have also documented that preconceptions are apparently changed in school settings but may quickly reassert themselves in the broader context of daily life (Redish & Steinberg, 1999). In addition, Georghiades (2000) reminds us that the conceptual changes reported in the literature are not necessarily permanent changes. Most of these claimed changes were actually measured right after the instruction. There was no clear distinction about whether these changes reflected students' profound change in thinking or a process of simply following what teachers instructed in some particular academic contexts, such as exams. The difficulty that practical efforts have encountered in facilitating conceptual change has forced some scholars to question the plausibility of Posner et al.'s model.

Pintrich, Marx, and Boyle (1993) criticized Posner et al.'s model as a "cold" model because it overlooks the non-rational characteristics of learning. This omission is clearly reflected in one statement that Posner and his colleagues made in their paper: "Our central commitment in this study is that learning is a rational activity" (Posner et al., 1982, p. 212). According to this model, when students meet new experiences in the classroom which do not match their existing mental structures, they will feel dissatisfied and be willing to accept new concepts to overcome this conflict. In other words, conceptual understanding is seen as the goal of student learning. However, the assumption that students approach their classroom learning with a rational goal of making sense of the information and coordinating it with their prior conceptions may not be accurate. Actually, students have many social goals in the school context besides academic understanding such as making friends, impressing peers, or pleasing instructors (Wentzel, 1991), which can turn them away from any in-depth intellectual engagement with the curriculum content. Students may passively face conceptual discrepancy by just memorizing the scientific concepts without understanding them (Larson, 1995; Loughran & Derry, 1997; Watson & Konicek, 1990). The normative goal theory has made this point very clear since it states that students with the goal of mastery learning are more engaged in deeper cognitive processing and tend to use more sophisticated cognitive strategies. In contrast, students with performance-orientated goals more often use surface processing and have less cognitive engagement (Ames, 1992; Dweck & Leggett, 1988; Nolen, 1988, 1996; Pintrich & De Groot, 1990).

Posner et al.'s model can also be criticized for its lack of a clear social dimension in learning. The model predicts that when students become dissatisfied with their original beliefs, they will try to find an alternative one that is intelligible, plausible, and fruitful. This description focuses on personal cognition and implies that all reasoning happens within an individual's mind. However, there are numerous theoretical articulations suggesting that an individual's learning in the classroom is not isolated, but greatly influenced by interactions with others. For Piaget (1970, 1973), social interaction is seen as a requirement for children to construct social knowledge and as a resource for cognitive

disequilibrium that leads to knowledge reconstruction. In Vygotsky's account, all higher mental functions originate from social relationships (Vygotsky, 1978). Besides these theoretical articulations, experimental studies have actually documented the merits of collaborative learning in the school setting. Barbosa, Jofili, and Watts (2004) claimed that collaborative learning increases students' self-esteem, interest in the subject, learning autonomy, and in-depth comprehension of learning tasks. Driver, Squires, Rushworth, and Wood-Robinson (1994) reported that in a group setting students can successfully bring their knowledge and experiences together to advance their thinking. Chang and Mao (1999) reported that while there is no difference in student achievement in knowledge and comprehension parts of a test that incorporated Bloom's taxonomy, the students who worked collaboratively performed better on the application part of the test.

"Warm" model

In contrast to the "cold" nature of Posner's model, the above-mentioned critiques led a "warming trend," to take place in conceptual change research (Sinatra, 2005). Considering the importance of motivational constructs in learning, Sinatra and Pintrich (2003) proposed the term "intentional conceptual change," which was defined as "the goal-directed and conscious initiation and regulation of cognitive, metacognitive, and motivational processes to bring about a change in knowledge" (p. 6). They argued that conceptual change interventions inspired by Posner and his colleagues focused mainly on what teachers could do to manipulate the context to support learners' knowledge restructuring. What is lacking in this model and its related instructional strategies is a description of the role of students' intentions in bringing about change. They criticized that the conceptual change pedagogy was oversimplified as a matter of placing students in circumstances that highlight points of conflict. Dole and Sinatra (1998) pointed out that cognitive conflict is unfortunately often insufficient to induce change. In their Cognitive Reconstruction of Knowledge Model (CRKM), Dole and Sinatra (1998) incorporated motivational constructs into the complexity of conceptual change learning. CRKM describes how learner and message characteristics interact, leading to a degree of engagement with the new concept. The learner characteristics entail existing knowledge and motivational factors. The strength and coherence of a learner's existing knowledge and his or her commitment to it are assumed to influence the likelihood of conceptual change. Motivational factors refer to a learner's interest, emotional involvement, self-efficacy, value, need for cognition, as well as the social context that supports or undermines his or her motivation. Message characteristics refer to the features of the instructional content or persuasive discourse designed to promote conceptual change, which can be described by using adjectives such as comprehensible, coherent, plausible, and rhetorically compelling. It is the interaction of the existing knowledge, instructional message, and individual motivational factors that is assumed to create a space for

knowledge reconstruction. Another "warm" model, Cognitive-Affective Model of Conceptual Change (CAMCC) was proposed by Gregoire (2003) based on a study of teachers' resistance to reform-oriented curricula that conflicted with their teaching beliefs. CAMCC shares much similarity with CRKM but posits a greater role for affective constructs such as anxiety and fear in conceptual change. Gregoire claimed that stress and threat appraisals "happen automatically before characteristics of the message are seriously considered" (p. 168). That is, the message characteristics may never be fully processed by a learner if the affective appraisals create a strong tendency to dismiss the message.

In summary, the "cold" model for conceptual change describes conceptual change as a logical process while the "warm" models acknowledge the importance of motivation and belief constructs in this process. In spite of this difference, both cold and warm models share a similar definition of conceptual change: replacement of students' ideas with scientific notions. Vosniadou (1999) moved away from this definition of conceptual change and defined it as a restructuring of a preconception. This amendment, however, still carries an implication that students' less acceptable conceptions are replaced by more sophisticated scientific concepts.

Although various models proposed different ways of teaching for conceptual change, their purpose for so doing remains the same as the cold model: conceptual replacement. Their underlying goal is that science teaching should be an assimilation of students' thinking into Western science-based school curriculum. In other words, these models take Western science as a universal form of knowledge that transcends cultural interpretation and is applicable to every corner of the world (Matthews, 1994). Students' life experiences and ethnoracial backgrounds were largely overlooked when defining the desired achievements of science education.

A CULTURAL PERSPECTIVE OF CONCEPTUAL CHANGE

Multicultural trends in science education

In today's context of globalization, scholars have realized the challenges that student diversity brings to school education. In 2001, two prestigious journals – *Science Education* and *the Journal of Research in Science Teaching* – published special issues to discuss multiculturalism and diversity in science education. According to Carter's (2004) analysis, two main tendencies emerged out of this discussion. The first tendency focused on culturally and linguistically diverse students. This position acknowledges the inherent universalism of Western science, but as it is judged to be the most "powerful" knowledge system, all students, despite their diverse backgrounds, are compelled to accommodate it (Cobern & Loving 2001; Lee, 2001). The remaining task for this group is consequently deemed to develop pedagogical strategies and curricula to

facilitate students' accommodation to Western science (e.g., Lee, 2003). The second trend explored a place for non-Western knowledge in school science (Stanley & Brickhouse, 2001). This position identifies the inherent Eurocentricism of current science curriculum and argues for inclusion of indigenous knowledge (Aikenhead, 2001; Snively & Corsiglia, 2001). The problem with this position is the justification for the inclusion of indigenous knowledge in terms of its Western scientific usefulness. It has been assumed that the degree of value depends on its translatability, that is, its removal from the original local, historical, and cultural context for relocation into the mainstream. In other words, most scholars in this group actually reiterate the universal idea of Western science, knowingly or unknowingly. This hidden Eurocentricism is quite obvious when Siegel (2002) tried to convince the readers of the compatibilities between multiculturalism in science education and the universal conception of science. He uses a set of criteria including structural, testable, predictive, and explanatory features to set up the superiority of Western science over local alternatives. He argues that the inclusion of indigenous knowledge in science education "must be justified not in epistemic but in *moral* terms" (emphasis in original, p. 809). Therefore, for both trends mentioned above, the knowledge-power relationships elucidated by postcolonial scholars (Battiste, 2000; Bishop & Glynn, 1999; L. T. Smith, 1999) were used to justify the hidden Eurocentricism, explicitly or implicitly, knowingly or unknowingly.

Carter (2004, 2006) re-read some of this literature from a postcolonial theoretical perspective and criticized the weak arguments of multiculturalism scholars in science education literature. Reiterating the importance of postcolonial science studies (Harding, 1998), Carter (2008a) argues for a more inclusive conceptualization of science. All cultures have systematic attempts to create their own understanding of the universe and their place within it. This more inclusive view sees local knowledge as scientific knowledge, which rises from local contexts and is in response to local needs. "Western science can thus be understood as a particular form of local knowledge tradition, shaped by and reproductive of, the culture and society in which it is articulated" (p. 175).

A hybrid space for science education

It is not new to call the everyday world a culture in contrast to the professional and educational spaces such as the workplace culture, school culture, and so on. According to Geertz (1973), culture is "an ordered system of meanings and symbols, in terms of which social interaction takes place" (p. 5). It consists of norms, values, beliefs, expectations, and conventional actions of a community. In the everyday culture, students' cognition is shaped mainly by their daily communications with their physical and social worlds. For example, the Sun rises in the east and sets down in the west. Such daily observation will make students think the Sun moves around the Earth. "Shut the door. Do not let the cold come in." Such language from parents may well contribute to students'

caloric view of heat. The norms and values of these daily communications are much different from those in school communication. They define the unique features of students' everyday cognition, being context-dependent, perception-dominated, interpretation-orientated, and analogy-laden (Zhou, Nocente, & Brouwer, 2008).

For those students with a cultural background different from the white, Western mainstream, their cognition is also shaped by the values, wisdoms, and norms of their ethnoracial culture, called "traditional culture" in this paper. The traditional culture greatly contributes to students' worldviews, which can be very different from science (Gauch, 2009). In my case, the Buddhism culture instilled a view of rebirth, which believes that all persons will be reborn in one of six realms (heaven, human beings, Asura, hungry ghost, animal and hell) after death, based on the Karma they accumulated during their current lives. This life view sustains the concept of ghost in my cognitive schema.

Student preconceptions are a product of their everyday culture plus traditional culture, both of which constitute their life-world culture. If we look at student preconceptions in a different way by changing ourselves from being an outside inspector with scientific ideas as judging criteria to being an insider of students' real-life world, we will find that student preconceptions, although in many cases at odds with science, make sense to students themselves. Students' preconceptions actually have a structure instead of being disconnected (Zhou, Nocente, & Brouwer, 2008). This is why student ideas have been called an alternative framework or science by some scholars (Driver & Erickson, 1983). It is important for us to consider this alternative science as one strong cultural factor when thinking of the goals and approaches of science education.

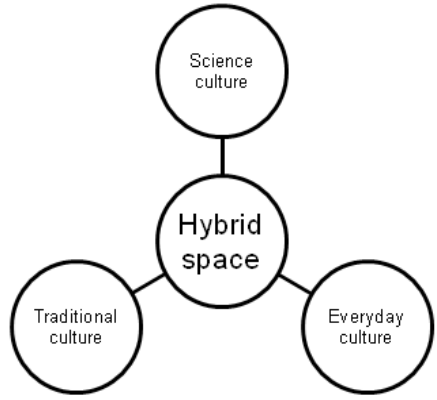

FIGURE 1. *A hybrid space for science education*

In today's context of globalization, science education actually takes place in a hybrid space of these three cultures: everyday culture, traditional culture,

and scientific culture (Figure 1). This space should not be seen as static and settled, but should rather be considered as unsettled and dynamic. In regards to literacy development, Sheehy and Leander (2004) claimed that speaking/writing shape the discourse space, and vice versa the space shapes discursive practices. Similarly, these three cultures will interact with each other and provide a unique and dynamic learning space for every science learner.

Many students will experience a clash between their everyday and traditional cultures with scientific culture, which defines the norms and conventions of scientists' thinking and behaving. Costa (1995) and Aikenhead (2001) developed a typology to describe different groups of students based on the congruence level between their non-school cultures and the school culture. These groups of students perform very differently in science learning. The metaphor of border crossing (Giroux, 1992) has been used to illustrate students' cultural transition to school science (Aikenhead, 1996; Aikenhead & Jegede, 1999). This metaphor announces that people must cross borders as they move from one culture to another. It reflects the uneasiness and struggles that students have to face when coming to the science classroom. It also signals that students may have different experiences when they cross the border due to their varying cultural backgrounds and personality factors. Referring to Costa (1995), Aikenhead and Jegede (1999) state that cultural transitions are smooth when the cultures of family and science are congruent, transitions are manageable when the cultures are somewhat different, transitions tend to be hazardous when the cultures are diverse, and transitions are virtually impossible when the cultures are highly discordant. The metaphor of border crossing does provide a tool to discuss the difficulty students have in learning science; however it seems to have little power explaining the phenomena mentioned in the following section.

Co-existence of contradictory conceptions

Postcolonial thinking denounces definitions of cultural superiority. Instead, it includes a concern and respect for the cultures, rights, and interests of all people (Carter, 2008b). Cultural dialogues are suggested as an efficient way to deal with diversity and conflict in many areas including domestic politics, diplomatic relations, and education. The purpose of the dialogue is not to downplay either side, but to generate mutual understanding and reach a win-win solution between multiple parties. In the hybrid space of science education, the result of classroom teaching is likely to be a coexistence of student conceptions and scientific conceptions rather than one replacing the other. Jegede (1995, 1997) noticed the coexistence of traditional culture-related indigenous knowledge and scientific knowledge when he studied science and mathematics education in Africa, and he developed a notion of collateral learning to describe such phenomena. He believed that collateral learning takes place when

some learners stored two or more discrepant concepts in long-term memory as cognitive schemata.

My commuting experience between Windsor (Canada) and Detroit (USA) can be used to illustrate this point. Windsor and Detroit are two border cities connected by the Ambassador Bridge over the Detroit River. Windsor is a much smaller city compared to Detroit. I live and work in Windsor, yet I go to Detroit quite frequently for shopping, visiting, and entertainment. I felt very nervous the first time I passed customs at the border. I wondered what questions the custom officers would ask me and worried that I might give inappropriate answers to their questions. However, I now feel much easier crossing the border, although I still carefully answer every question the custom officer asks. The border between the life-world culture and science culture to students is comparable with the Windsor-Detroit border to me. Students may initially feel uneasy in learning science. Although they apparently learn science at school, when they come back to their life-world after school, nobody can be sure they will not slide back to their original thinking. In other words, life-world concepts and science concepts may coexist, and students may find ways to "commute" between these two ways of thinking. Such commuting will become easier as experience accumulates. This coexistence of and commuting between two worlds are quite common in adult life. Many scientists in North America excel in scientific research and teaching, and meanwhile they are faithful Christians (Hutchinson, 2003). In China, many medical doctors integrate Chinese traditional medicine and Western biomedicine in their clinical practice. The ideal of an integrative healthcare system, which combines biomedicine with traditional medicine, has been examined by scholars (e.g. Hollenberg & Muzzin, 2010).

Beyond border-crossing

The coexistence mentioned above, however, is not a simple sum of the original A and B, but a combination of two. My life will be different if I simply stay in Windsor without traveling to Detroit. My perspective of living in Windsor will be different if there was no Detroit close by. Similarly, students' daily thinking will be impacted by school learning. In this sense, even though students did not experience a radical conceptual change, their preconceptions may have been modified by being exposed to scientific views. As far as my concept of ghost is concerned, my initial understanding of ghosts, as described at the beginning of this paper, was developed from what I heard, watched, communicated, and practiced during my childhood life as well as from the Buddhist culture that has been shaping Chinese lives for hundreds of years. School and university education has influenced the way I think and talk about ghosts in an academic context, and I also try to convince myself of the non-existence of ghosts in my life-world contexts using scientific knowledge. However, this does not mean that I have totally forgotten about ghosts. The ongoing negotiation between

scientific knowledge and personal knowledge about ghosts has not stopped me from turning back to check whether anything is following me while walking in the dark, but the back turning has become much less frequent compared with my childhood time.

Students' final understanding of the physical world is "in-between" the science culture and life-world culture. In other words, students' exit concepts are neither their orginal preconceptions, nor scientific concepts, rather their preconceptions will have influences on their understanding of science. In this regard, the border crossing analogy has offered little help. Even Aikenhead (2006), a well known scholar in the border crossing literature, has realized that,

> Cross-cultural science teaching can only make indigenous and Western science accessible to students, cognitively, emotionally, and culturally. How students individually integrate the two, if at all, is always their prerogative. Further research on this phenomenon is required. (p. 125)

The metaphor of border crossing implies a static dichotomy between the non-school culture and school culture. It has been found to be inadequate in explaining American Indigenous women's experience in making sense of Eurocentric science in the context of indigenous knowledge (Brandt, 2007, 2008a, 2008b). A different theoretical framework is necessary for an explanation. To this end, Brandt (2007) turns to Hughers' (2002) analytical framework for help, which can be described as *both/and* rather than *either/or* when examining a binary. As I discussed above, the *both/and* cannot be taken as a product of simple mathematical addition, rather a *third entity* or *third space* is necessary to guide our understanding of this topic. The popular thinking of "multiple I" in current cultural studies may offer some insights. As an immigrant from China, if somebody asks me: "Are you a Canadian?" I will answer "yes" since I live and work in Canada with a Canadian passport. However, if he or she asks me: "Are you a Chinese?" I will not answer "no" because I cook Chinese food every day and speak Mandarin with my family members and Chinese friends. This dual, or better still, "mixed" identity defines my overall patterns of values and varying behaviours in different contexts. Similarly, students' thinking will involve some complexity after being exposed to school education. It is this complexity and its formation that is worthy of further study.

THE NEED FOR RE-DEFINING THE GOAL OF SCIENCE EDUCATION

During the days when I was writing the last sections of this paper, I visited my teacher candidates who were placed at schools. After observing every class, I struggled with the same question, "Is it legitimate to *train* students to talk and think as a scientist?" We tell students the accurate definition of scientific concepts and ask them to follow certain steps to solve problems. Although we try different approaches to deliver the content to students and encourage students to learn from mistakes, our final goal is to make sure that students

do not make any "mistake." To elaborate this point, I want to share another personal story.

One day while I was at work in Beijing before moving to Canada, my workplace bought every employee a thermal mug. Because fake products were commonly marketed in those days, my colleague and I were interested to know whether our mugs worked properly. My colleague had a Bachelor's degree in science and I then had a Master's degree in science education. We filled the two mugs with hot water and decided to wait about two hours. We thought that a comparison of water temperatures at the end of two hours would provide a good answer to our question. A very scientific process! My brother who visited me from the countryside joined in soon after we filled the mugs with hot water and suggested that we did not have to wait for two hours. He said we could answer the question by simply touching the outside of the mugs: the mug that feels warm from outside does not work! My colleague and I laughed. We laughed at our "perfect" scientific thought and overlooking of such an easy solution suggested by a person without much school education.

Do we "distinguish or extinguish ideas" by teaching for conceptual change? Linn (2008) asked educators. Formal school education seemed to be successful in training my colleague and me to be good science workers. It however subjugated the ideas from us that could easily come out of everyday life experiences.

Science has been traditionally considered as a relatively objective discipline. The goal of science education is accordingly set up as developing students' basic knowledge, skills, and scientific attitude in many countries' curriculum documents with little consideration of what backgrounds or experiences students bring into the classroom. Not very long ago, eradicating "superstitions" was included in Chinese curriculum documents as one of the key goals of science education. However, the ghost story implies that it is almost impossible to completely take away culturally embedded concepts from students. The thermal mug story indicates the negative impacts of traditional science education.

A cultural perspective to science education moves away from a colonial definition of conceptual change as a replacement of student ideas with scientific notions; rather it values the contributions of both knowledges (*plural*) to students' intellectual growth. The cultural perspective takes the classroom as a stage for dialogue. Although scientific epistemology is still one of the significant purposes of science instruction given its great impacts on our lives and society, a discussion of scientific models is dry, biased, and less effective without looking at the differences between the scientific and other ways of knowing. The outcome of classroom discourse cannot be expected to be a replacement of students' views with scientific notions, at least not for all students for all learning tasks. In other words, the goal of science education should not be to force students to throw away their culture-embedded conceptions; rather the coexistence between scientific understanding and culture/experience-based

views should be considered as acceptable. Students should not be denounced when they cross the borders of their everyday culture, traditional culture and science culture in two-way directions. In other words, the goal of science education is to have students "master and critique scientific ways of knowing without, in the process, sacrificing their own personally and culturally constructed ways of knowing" (O'Loughlin, 1992, p. 791). Similarly, Hodson (1992) suggested "the task of science teaching is to help all children acquire scientific knowledge, interests, skills, attitudes and ways of thinking without doing violence to their particular cultural beliefs and experiences" (p. 16). In regards to aboriginal education in Canada, Battiste (2000) stated, "Creating a balance between two worldviews [Indigenous and Western] is the great challenge facing modern educators" (p. 202). This statement applies to the education of other ethnoracial groups as well, which is called neo-indigenous thinking by Aikenhead and Ogawa (2007).

ARGUMENT APPROACH TO CONCEPTUAL ADVANCEMENT

In this section, affirming a cultural perspective of conceptual change, I suggest an argumentation approach to teaching scientific concepts. "Argument" has recently appeared in science education literature for its potential function in the social construction of knowledge and in bringing about deeper learning *about* science (Driver, Newton, & Osborne, 2000; Osborne, 2001). Its justifications come from an understanding of the nature of scientists' work. As Kuhn (1993) and Thagard (1992) stated, in the history of science a new framework takes the place of the previous one through scientific argument. For example, the dialogues between the caloric and kinetic views of heat, the particle and wave views of light, and the debate between Bohr and Einstein on quantum mechanics are typical cases in which argument plays a major role. Scientists actually practice argument on a daily basis during the discourse of constructing scientific knowledge that is consistent and acceptable to the scientific community. They argue with themselves through frequent idea changes, and, more importantly, they argue with each other through publication, conferences, and informal occasions in order to build knowledge with minimum bias. It is also believed that science should be taught in a way that reflects the nature of science (American Association for the Advancement of Science, 1990; National Research Council, 1996). From this perspective, the central position of argument in scientific development assures it a space in classroom practice. However, because the underlying goal of science education is still taken as assimilating students into school science, this body of literature (e.g. Osborne, Erduran, & Simon, 2004; Simon, Erduran, & Osborne, 2006) focuses on developing students' skills to construct scientific arguments rather than an appreciation of cultural diversity through argumentation.

Postcolonial thinking actually sees argument as a natural fit for a teaching context where student ideas are in conflict with school science. An argument

deals with disagreements. Student preconceptions are in most cases different from scientific notions, and there often exist disagreements among students as well. These differences provide an opportunity for arguments to occur in the classroom. An argument is a recursive journey. It takes time for arguers to understand each other's point and justification. Arguers explain, testify, defend, and convince opponents to accept their ideas while at the same time, they remain open-minded and try to understand the stand of opponents. Different from past conceptual change pedagogy, the argument approach does not endorse a process of letting students choose between "good" and "bad" apples. It instead recommends a process that leads students to examine the pros and cons of both apples for given cultural contexts. Students become intentional learners who actively re-examine their knowledge in a classroom-based social context that is based on the new learning experiences and accepting of the conventions of different cultures (including the Western science culture). The process of conceptual change is, therefore, an argument process of problem solving, with argument and counter argument taking place at each step; but it is not an exercise in downplaying anybody's ideas that were generated from different experiences and cultures. Therefore, a more appropriate name for conceptual change could be "conceptual advancement."

Assume an argument involves an A and B side. From the perspective of side A, the argument has three possible outcomes: (1) Side A agrees with Side B and takes B's stand (accepting B); (2) Side A disagrees with Side B and does not change (rejecting B completely); (3) Both sides reach a mutual understanding and result in a blended solution (rejecting B partially). It is apparent that the past understanding about conceptual change has limited our view to only the first two cases. If students take the scientific view, we feel happy. If students do not, we believe that is because preconceptions are hard to change. We haven't yet thought about the third case enough. The cases where students apparently understood science but reaffirmed back to their original ideas in the daily life context have always been pessimistically reported and attributed to the failure of teaching (Redish & Steinberg, 1999). From a postcolonial perspective, this third case is actually not only possible, but also more likely to take place compared with the other two.

The use of argument in science education can well address the criticisms that Posner et al.'s (1982) model has received since it addresses the social and non-rational factors for learning. As the word argument itself implies, the argument approach of teaching is a social process. Teacher is a facilitator as well as an "arguer" who represents scientific notions. It empowers students to present their ideas and challenge the teacher's stand. Whatever ideas they bring up are significant to the classroom community. The aim of this approach is to help students appreciate, rather than force them to accept scientific views. This process has the potential to make students feel respected and consequently be motivated to get involved. Argument can also effectively incorporate metacogni-

tion, which is claimed to be important by Sinatra and Pintrich (2003). Paris and Winograd (1990) stated: "any cognition that one might have relevant to knowledge and thinking might be classified as metacognition" (p. 19). Based on a review of many studies, they concluded that students can enhance their academic learning and cognitive development "by becoming aware of their own thinking as they read, write, and solve problems in school" (p. 15). An argument is a process that can implement the teaching of meta-knowledge. Distinctions and features of students' life-world thinking and the scientific criteria for knowledge claims will be recognized, discussed, and underlined in the discourse. This kind of meta-knowledge is valuable for students to initiate, coordinate, and control their processes of learning science and to understand issues about science. In other words, students with this knowledge are more likely to become intentional learners (Sinatra & Pintrich, 2003).

In my own school science experience, if my teachers had allowed me to share and discuss with the class, my life-world learning about ghosts and the concept of rebirth, it might not have jeopardized my learning of science at all. Actually, such opportunities would make me feel more comfortable in the science classroom. And more importantly, it might result in even better understanding of both knowledges, their associated epistemologies, and limitations as well.

CONCLUDING REMARKS

Past studies of conceptual change, no matter whether they applied a "cold" model or a "warm" approach, shared the same problem when they portrayed conceptual change as a replacement of student preconceptions with scientific concepts. Cultural studies of science education over the last decades have drawn our attention to many issues such as integration of Indigenous knowledges, inclusion of different worldviews, and school education as cultural transmission. Such postcolonial thinking questions the legitimacy and effectiveness of the colonial process behind the term of conceptual change and advocates a coexistence between the life-world based ideas and Western science-based concepts. In other words, the cultural perspective to conceptual change suggests a rethinking of the goal of science education. The replacement of the life-world cognitive products with the intellectual products of the scientific community is not realistic and justifiable for all students and for all concepts; rather the classroom discourse between the life-world culture and school science culture should aim at students' enriched understanding of both sides. In the end, students will gain conceptual advancement in their understanding of the discussed topics and issues. It is a pressing task to revisit the curriculum policy documents and change their descriptions of the goal of science education from using assimilation language to more inclusive language.

Since science education takes place in a hybrid space of the everyday culture, traditional culture, and science culture, teaching and learning science in a

more authentic way that brings arguments into the classroom has epistemological, pedagogical and moral justifications. Epistemologically speaking, the use of arguments helps students to fully examine both their own ideas and the scientific notions, which will contribute to their in-depth understanding of both epistemologies. Pedagogically speaking, the use of arguments has the potential to motivate students to become engaged in the learning process and provide students opportunities to learn how to respect and be respected in a community. As far as moral considerations, the use of argument can promote cultural appreciation in a diverse student population.

Similar to the promotion of inquiry-based science teaching, school teachers may have concerns with the argument approach. Lack of time, potential risk of losing class control, and possible failure in curriculum content coverage are some of the foreseen issues that may bother teachers when they think of such approach. Also, this approach may pose challenges to those teachers who have inadequate knowledge about cultural perspectives and still believe in teachers' absolute authority inside the classroom. For those teachers who believe in the universalism of science, they might be concerned that this particular argument approach teaches pseudoscientific or supernatural ideas in their science classrooms, resulting in a negative impact on students' understanding of the nature of science. Additional concerns might stem from teachers' lack of preparation in using arguments as a pedagogical means to develop students' in-depth understanding of the epistemologies of Western science and non-Western knowledge. Therefore, for teachers to buy into the argument approach, it is necessary to help teachers change their views about science, philosophy of science teaching, and perception of the power relationship between the teacher and students. This opens up a research agenda for teachers' professional development around this approach of science teaching. As well, future research is necessary to study the actual impacts of argument approach on cultural appreciation among diverse students, the enhancement of student motivation in science classroom, and the advancement of student conceptual understanding.

REFERENCES

Aikenhead, G. S. (1996). Science education: Border crossing into the subculture of science. *Studies in Science Education, 27*(1), 1-52.

Aikenhead, G. S. (2001). Integrating western and aboriginal sciences: Cross-cultural science teaching. *Research in Science Education, 31*(3), 337-355.

Aikenhead, G. S. (2006). *Science education for everyday life: Evidence-based practice*. New York: Teachers College Press.

Aikenhead, G. S., & Jegede, O. J. (1999). Cross-cultural science education: A cognitive explanation of a cultural phenomenon. *Journal of Research in Science Teaching, 36*(3), 269-287.

Aikenhead, G.S., & Ogawa, M. (2007). Indigenous knowledge and science revisited. *Cultural Studies of Science Education, 2*, 539-591.

American Association for the Advancement of Science (AAAS). (1990). *Science for all Americans*. NY: Oxford University Press.

Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Education Psychology, 84*, 26-271.

Bar, V., Zinn, B., & Rubin, E. (1997). Children's ideas about action at a distance. *International Journal of Science Education, 19*(10), 1137-1157.

Barbosa, R., Jofili, Z., & Watts, M. (2004). Cooperating in constructing knowledge: Case studies from chemistry and citizenship. *International Journal of Science Education. 26*(8), 935-949.

Battiste, M. (Ed.). (2000). *Reclaiming indigenous voice and vision*. Vancouver, BC: University of British Columbia Press.

Bishop, B. A., & Anderson, C. W. (1990). Student conceptions of natural selection and its role in evolution. *Journal of Research in science Teaching, 27*(5), 415-427.

Bishop, R., & Glynn, T. (1999). *Culture counts: Changing power relations in education*. Palmerston North, NZ: Dunmore Press.

Brandt, C. B. (2007). Epistemology and temporal/spatial orders in science education: A response to Aikenhead & Ogawa's: Indigenous knowledge and science revisited. *Cultural Studies of Science Education, 2*, 599-605.

Brandt, C. B. (2008a). Discursive geographies in science: Space, identity, and scientific discourse among indigenous women in higher education. *Cultural Studies of Science Education, 3*, 703-730.

Brandt, C. B. (2008b). Scientific discourse in the academy: A case study of an American Indian undergraduate. *Science Education, 92*(5), 825-847.

Carter, L. (2004). Thinking differently about cultural diversity: Using postcolonial theory to (re) read science education. *Science Education, 88*(6), 819-836.

Carter, L. (2006). Postcolonial interventions within science education: Using postcolonial ideas to reconsider cultural diversity scholarship. *Educational Philosophy and Theory, 38*(5), 677-691.

Carter, L. (2008a). Sociocultural influences on science education: Innovation for contemporary times. *Science Education, 92*(1), 165-181.

Carter, L. (2008b). Globalization and science education: The implications of science in the new economy. *Journal of Research in Science Teaching, 45*(5), 617-633.

Chang, C-Y., & Mao, S-L. (1999). The effects on students' cognitive achievement when using the cooperative learning method in earth science classrooms. *School Science and Mathematics, 99*(7), 374-379.

Clement, J. (1982). Students' preconceptions in introductory mechanics. *American Journal of Physics, 50*(1), 66-71.

Cobern, W. W., & Loving, C. C. (2001). Defining "science" in a multicultural world: Implications for science education. *Science Education, 85*(1), 50 – 67.

Costa, V. B. (1995). When science is "another world": Relationships between worlds of family, friends, school, and science. *Science Education, 79*, 313–333.

Dole, J. A., & Sinatra, G. M. (1998). Reconceptualizing change in the cognitive construction of knowledge. *Educational Psychologist, 33*(2/3), 109-128.

Driver, R., & Erickson, G. (1983). Theories in action: Some theoretical and empirical issues in the study of students' conceptual frameworks in science. *Studies in Science Education, 10*(1), 37-60.

Driver, R., Guesne, E., & Tiberghien, A. (Eds.) (1985). *Children's ideas in science*. Open University Press.

Driver, R., Newton, P., & Osborne, J. (2000). Establishing the norms of scientific argumentation in classrooms. *Science Education, 84*, 287-312.

Driver, R., Squires, A., Rushworth, P., & Wood-Robinson, V. (1994). *Making sense of secondary science*. London, UK: Routledge.

Dweck, C. S., & Leggett, E. L. (1988). A social cognitive approach to motivation and personality. *Psychological Review, 95*(2), 256-273.

Gauch, H. G. (2009). Science, worldviews, and education. *Science and Education*, *18*(6/7), 667-695.

Geertz, C. (1973). *The interpretation of culture.* New York, NY: Basic Books.

Georghiades, P. (2000). Beyond conceptual change learning in science education: Focusing on transfer, durability and metacognition. *Educational Research*, *42*(2), 119-139.

Gilbert, J. K., & Watts, D. M. (1983). Concepts, misconceptions and alternative conceptions: Changing perspectives in science education. *Studies in Science Education*, *10*(1), 61-98.

Giroux, H. (1992). *Border crossings: Culture workers and the politics of education*. New York, NY: Routledge.

Gregoire, M. (2003). Is it a challenge or a threat? A dual-process model of teachers' cognition and appraisal process during conceptual change. *Educational Psychology Review*, *15*(2), 147–179.

Harding, S. (1998). Multiculturalism, postcolonialism, feminism: Do they require new research epistemologies? *Australian Educational Researcher, 25*(1), 37 – 51.

Helm, H. (1980). Misconceptions in physics amongst South African students. *Physics Education*, *15*, 92-105.

Hewson, P. W., & Hewson, M. G. A'B (1988). An appropriate conception of teaching science: A view from studies of science learning. *Science Education*, *72*(5), 597-614.

Hodson, D. (1992). Towards a framework for multicultural education. *Curriculum*, *13*, 15–18.

Hollenberg, D., & Muzzin, L. (2010). Epistemological challenges to integrative health care: An anti-colonial perspective on the combination of biomedicine with complementary/alternative medicine. *Health Sociology Review, 19*(1), 34-56.

Hughes, C. (2002). Beyond the post-structuralist-modern impasse: The woman returner as 'exile' and 'nomad.' *Gender and Education, 14*(4), 411-424.

Hutchinson, I. (2003). Science: Christian and natural. *Perspectives on Science and Christian Faith, 55*(2), 72-79.

Kuhn, D. (1993). Science as argument. *Science Education*, *77*, 319-337.

Kuhn, T. (1970). *The structure of scientific revolutions.* Chicago, Il: Chicago University Press.

Jegede, O. (1995). Collateral learning and the eco-cultural paradigm in science and mathematics education in Africa. *Studies in Science Education*, *25*, 97–137.

Jegede, O. (1997). School science and the development of scientific culture: A review of contemporary science education in Africa. *International Journal of Science Education*, *19*, 1–20.

Larson, J. O. (1995, April). *Fatima's rules and other elements of an unintended chemistry curriculum*. Paper presented at the American Educational Research Association annual meeting, San Francisco, CA.

Lee, O. (2001). Culture and language in science education: What do we know and what do we need to know? *Journal of Research in Science Teaching, 38*(5), 499 – 501.

Lee, O. (2003). Equity for linguistically and culturally diverse students in science education: A research agenda. *Teachers College Record, 105*(3), 465 – 489.

Linn, M. C. (2008). Teaching for conceptual change: Distinguish or extinguish ideas. In S. Vosniadou (Ed.), *International handbook of research on conceptual change* (pp. 694-722). New York, NY: Routledge.

Loughran, J., & Derry, N. (1997). Researching teaching for understanding: The students' perspective. *International Journal of Science Education, 19*, 925-938.

Matthews, M. (1994). *Science teaching: The role of history and philosophy of science*. New York, NY: Routledge.

McCloskey, M. (1983). Intuitive physics. *Scientific American, 248*, 114-122.

National Research Council (NRC). (1996). *National science education standards*. Washington, DC: National Academy Press.

Nolen, S. (1988). Reasons for studying: Motivational orientations and study strategies. *Cognition and Instruction, 5,* 269-287.

Nolen, S. B. (1996). Why study? How reasons for learning influence strategy selection. *Educational Psychology Review, 8*(4), 335-355.

Nussbaum, J., & Novick, S. (1981). Brainstorming in the classroom to invent a model: A case study. *School Science Review, 62*(221), 771-778.

O'Loughlin, M. (1992). Rethinking science education: Beyond Piagetian constructivism toward a sociocultural model of teaching and learning. *Journal of Research in Science Teaching, 29*(8), 791-820.

Osborne, J. (2001). Promoting argument in the science classroom: A rhetorical perspective. *Canadian Journal of Science, Mathematics and Technology Education. 1*(3), 271-290.

Osborne, J., Erduran, S., & Simon, S. (2004). Enhancing the quality of argumentation in school science. *Journal of Research in Science Teaching, 41*(10), 994-1020.

Osborn, R., & Freyberg, P. (1985). *Learning in science: The implications of children's science*. Auckland, NZ: Heinemann.

Paris, S. G., & Winograd, P. (1990). How metacognition can promote academic learning and instruction. In B. F. Jones & L. Idol (Eds.), *Dimensions of thinking and cognitive instruction* (pp. 11-52). Hillsdale, NJ: Lawrence Erlbaum Associates.

Piaget, J. (1970). *Genetic epistemology.* New York: Columbia University Press.

Piaget, J. (1973). *To understand is to invent*. New York: Viking Press.

Pintrich, P. R., & De Groot, E. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82,* 33-40.

Pintrich, P. R., Marx, R. W., & Boyle, R. A. (1993). Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change. *Review of Educational Research*, *63*(2): 167-99.

Posner, G. J., Strike, K. A., Hewson, P. W., & Gertzog, W. A. (1982). Accommodation of a scientific conception: Toward a theory of conceptual change. *Science Education, 66*(2), 211-227.

Redish, E. F., & Steinberg, R. N. (1999). Teaching physics: Figuring out what works. *Physics Today, 52,* 24-30.

Sheehy, M., & Leander, K. M. (2004). Introduction. In K. M. Leander & M. Sheehy (Eds.), *Spatializing literacy research and practice* (pp. 1-14). New York, NY: Peter Lang.

Siegel, H. (2002). Multiculturalism, universalism, and science education: In search of common ground. *Science Education, 86*, 803-820.

Simon, S., Erduran, S., & Osborne, J. (2006). Learning to teach argumentation: Research and development in the science classroom. *International Journal of Science Education, 28* (2-3), 235-260.

Sinatra, G. M. (2005). The "warming trend" in conceptual change research: The legacy of Paul R. Pintrich. *Educational Psychologist, 40*(2), 107-115.

Sinatra, G. M., & Pintrich, P. R. (2003). The role of intentions in conceptual change learning. In G. M. Sinatra & P. R. Pintrich (Eds.), *Intentional conceptual change* (pp. 1-18). Mahwah, NJ: Lawrence Erlbaum.

Smith, E. L., Blakeslee, T. D., & Anderson, C. W. (1993). Teaching strategies associated with conceptual change learning in science. *Journal of Research in Science Teaching, 30*(2), 111-126.

Smith, L. T. (1999). *Decolonizing methodologies: Research and indigenous peoples.* London, UK: Zed Books.

Snively, G., & Corsiglia, J. (2001). Discovering indigenous science: Implications for science education. *Science Education, 85*(1), 6-34.

Stanley, W. B., & Brickhouse, N. W. (2001). Teaching sciences: The multicultural question revisited. *Science Education, 85*(1), 35-49.

Thagard, P. (1992). *Conceptual revolutions*. Princeton, NJ: Princeton University Press.

Vosniadou, S. (1999). Conceptual change research: State of the art and future directions. In W. Schnotz, S. Vosniadou, & M. Carretero (Eds.). *New perspectives on conceptual change* (pp. 3-13). New York, NY: Pergamon Press.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Watson, B., & Konicek, R. (1990). Teaching for conceptual change: Confronting children's experience. *Phi Delta Kappan*, *71*(9), 680-685.

Wentzel, K. R. (1991). Social and academic goals at school: Motivation and achievement in context. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement* (Vol. 7, pp.185-212). Greenwich, CT: JAI Press.

Zhou, G., Nocente, N., & Brouwer, W. (2008). Understanding student cognition from an analysis of their preconceptions in physics. *Alberta Journal of Educational Research, 54*(1), 14-29.

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BOOK REVIEW / CRITIQUE DE LIVRE

HASSAN MAHAMDALLIE (ED.). *Defending Multiculturalism: A Guide for the Movement.* London, U.K: Bookmarks Publications. (2011). 231pp. (£8.99) (ISBN 978-1-90519-284-7).

Defending Multiculturalism: A Guide for the Movement is a reaction to British Prime Minister David Cameron's early 2011 speech on the failure of multiculturalism (Cameron, 2011). This speech proved to be incendiary and led to a number of reactions, including petitions, responses published in British daily, *The Guardian*, a rally and, of course, this collection. Using essays, poems, photographs and artwork from activists, scholars, politicians, and poets, *Defending Multiculturalism* is a determined and impassioned critique of Cameron's speech itself. The subtext of this compilation exposes oft-reinforced trends of Islamophobia and class discrimination currently present in the West. This book illustrates how Cameron's critique of Britain's current multicultural policy is the manifestation of larger social and political climates that have emerged since 9/11. While the immediate goal is to respond to Cameron's statements, this collection provides a larger critique of the misuses of, as well as the misunderstandings surrounding, multiculturalism. In this short review, I will discuss how this text illustrates and examines the concept of multiculturalism itself.

In his introduction, Hassan Mahamdallie states that the book's purpose is to promote multiculturalism as a public policy that shapes multiple cultural realities, as expressed by the diversity of genres included. He outlines the aftermath of Cameron's speech and explains why so many communities and individuals saw it as a clear cause for concern. While this chapter sets up the political context for the reader, it does not clearly define multiculturalism itself. Clearly, Britain's multicultural policy has similar tenets to other forms of multiculturalism; however, the specific brand of multiculturalism is not made clear. The meanings attached to the term "multiculturalism" are slippery: the word itself is heavily context dependent, manifesting in different ways based on its social, political and historical milieus. Scholars Nasar Meer and Tariq Modood (2011) clarified, "in both theoretical and policy discourses, multiculturalism means different things in different places" (p. 179). Conceptually, it

can signify anything from mere tolerance to fostering cultural exchange. As such, the multiculturalism(s) that emerge can differ substantially from one context to another. In *Defending Multiculturalism*, Modood ("Multiculturalism and integration") offered another hypothesis for why this concept remains blurry, "This is partly because 'multiculturalism' is too often defined by its critics, whose sole purpose is to create a straw man to knock down. But its [sic] also because there is more than one form of multiculturalism and they relate to integration in different ways" (p. 64). The lack of conceptual clarity surrounding multiculturalism in general calls for perpetual clarification of how the term is being taken up at specific times and in specific spaces. While I would be leery of the inclusion of a one-size-fits-all definition, I do believe that a working definition of how multiculturalism is being conceptualized and worked through within the confines of this book is necessary, offering the reader a firmer grasp of its theoretical frame (this would be particularly helpful to those readers living outside of Britain).

That said, the multiplicity of definitions offered by the authors create a very nice juxtaposition that allows the reader to piece together various interpretations of the concept. Multiculturalism is defined in multiple and complex ways; these definitions unfold throughout the collection, each author adding a further layer of understanding to how multiculturalism is being interpreted. For example, Zita Holbourn ("The freedom to express who we are") dismisses the notion that multiculturalism can be defined in strictly political terms, adding that it

> is ever-changing and ever evolving as we embrace traditions that are ancient, handed down to us through generations while adopting, adapting and experiencing new ones so the two fuse together to create an eclectic explosion of religion, culture, music, food, language and lifestyle. (p. 53)

Holbourn's position is that multiculturalism is a form of expression that binds citizens, thereby creating an ethos of exchange. Modood ("Multiculturalism and Integration") characterizes this exchange as a form of social, cultural and political integration that has less to do with recognition of minority groups and has more to do with "civic consultations, political participation, institutional policies (for example, schools and hospitals, etc.)" (p. 71). This account of multiculturalism focuses on state interventions that might formalize exchange and growth between members of diverse communities. In his chapter on why trade unions must defend multiculturalism ("Don't give an inch"), Billy Hayes contends that racism, class discrimination and Islamophobia are "damaging to the economic development of our society" (p. 202). From an economic perspective, Hayes suggests that in a globalized society, multiculturalism offers tangible advantages. These are only three of the lenses used to illustrate the many incarnations of multiculturalism – and these demonstrate a deep compatibility rather than mutual exclusion. This compatibility is indicative of the two main themes running throughout the book: that multiculturalism carries with

it a deep commitment to inclusion, rather than simply recognition. Secondly, that multiculturalism ought not be divisive, indicating that there is a richness to be gained through mutual understanding, creation and partnership.

A refreshing change from typically sterile academic writing, this collection includes articulate and emotional language to communicate not only the position of this particular text but also an important political stance. For example, in his introduction, Mahamdallie ("Introduction") is quick to point out that "We all know that the Tories like nothing more than a spoonful or two of bigotry with their politics, but Cameron's speech marked a step-change in racism" (p. 17). Similarly, Ken Livingstone ("In praise of multicultural London") discusses Cameron's speech in the context of political strategy and does not hesitate to offer his own analysis of Cameron's tactic: "he was not responding to a genuine set of political concerns. He was using a time-honoured tactic of right-wing politicians whose policies are undermining people's standard of living, destroying jobs and creating insecurity" (p. 32). A combination of punchy language, moving photo-essays, and poetry offers the reader a strong dose of both content and conviction.

Defending Multiculturalism is helpful for an academic audience in that it offers an interdisciplinary, twofold, discussion: first, it sheds light on the many reverberations that attacks on multiculturalism create. These reactions are widespread and include many facets of the population, not simply those identified as ethnic or cultural minorities. Further, it speaks to the intensely complex and multifaceted nature of multiculturalism in that it underlines and exemplifies how discussions on culture cannot be limited to questions of ethnicity. Conversations around multiculturalism must include issues surrounding socio-economic class, religion and sexual orientation. This collection exemplifies how discussions on multiculturalism must include a broader understanding of "culture" to include a wider spectrum of issues, perspectives and allegiances. An academic crowd might benefit from the refreshing constellation of mediums that bring together multiple elements of multiculturalism. This same crowd might, however, be tempted to wonder about the conceptual foundations of the term and crave further clarification.

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REFERENCES

Cameron, D. (2011, February). *Radicalisation and Islamic extremism.* Speech given at Munich Security Conference, Munich, DE.

Meer, N., & Modood, T. (2011). How does interculturalism contrast with multiculturalism? *Journal of Intercultural Studies*, *33*(2), 175–196. doi:10.1080/07256868.2011.618266

HALL, E. L. & RUDKIN, J. K. *Seen & heard: Children's rights in early childhood education.* London, ON: Althouse Press. (2011). 115 pp. $28.95 (Paperback). (ISBN 978-0-920354-72-8).

Seen & Heard reads like a conversation between two friends, both professionally and academically engaged in early childhood education (ECE). The text shifts back and forth between academic literature, professional anecdotes, examples from pop culture films, and the authors' experiences as parents. This book provides a unique contribution to the field of early childhood education, as very young children are often excluded from inquiry into children's rights (Reynaert, Bouverne-de-Bie, & Vandevelde, 2009). It is highly recommended for students in early childhood or preschool and primary college and university programs, for practicing educators and teachers, and for parents of young children.

The book is written in very accessible language and provides much fodder for discussion. Although many of the arguments seem self-evident and the perspective is very U.S.-centric, there are a number of gems hidden amongst the theoretical chapters that make it a must-read. For example, the authors discuss the tension between adult and child perspectives with regards to rights, concluding that children have the right to express opinions but not to make all decisions. They also emphasize that children need both the right to protection and the right to participation, questioning the over-emphasis in ECE on child protection, stating that overprotecting children is itself a risk, and suggesting we make "spaces for children as safe as necessary, not as safe as possible" (p. 37). Finally, they present a nuanced and enlightening discussion of the tension between the rights of individual children and communal responsibilities, with a focus on groups and children as community members.

The first chapter is an introduction to the subject of young children's rights and to the setting, the Boulder Journey School. The Boulder Journey School is a private childcare centre in Boulder, Colorado, inspired by the public preschools of Reggio Emilia, Italy. The highlight of this chapter is the presentation of the Boulder Journey Charter on Children's Rights, with 60 statements dictated by

children. For example, "children have a right to touch everything, but gently, but not birds because that can scare them very much" (p. 8). The following three chapters are theoretical in nature, focusing respectively on the similarity of the children's rights movement to other human rights movements, the difference between the children's rights movement and other rights movements, and the need to balance individual and communal rights.

The final two chapters present documentation and reflection on two projects undertaken at Boulder Journey School: a group of four-year-olds building a "hamster city," and a group of two- and three-years-olds constructing their own "private spaces." The first project focuses on children, teachers, and parents building a city for the classroom's pet hamster. Throughout this project, the teachers support the children as they explore the hamster's right to freedom and movement. The project is inspirational and moving, particularly when the hamster stops biting the children once it has more space and a city of its own, or when it escapes from its city (leading to a huge search party), only to return when a child calls its name. While the *Hamster City* chapter is without a doubt the highlight of the book, the *Private Spaces* chapter leaves readers wondering whether an investigation of children's rights is even possible with children who are non-verbal or just learning to speak. This second project is presented much more briefly, and although the authors assert that the focus on children's rights at the Journey School began with teachers wanting to expand a conversation they had about war with a group of four-year-olds to include pre-verbal infants and toddlers, they don't quite succeed—focusing instead on the joy children have as they create forts. There is a discussion about children's right to withdraw from the world, the importance of children choosing and having control over their special places, and the need for them to construct, deconstruct, and reconstruct these spaces. However, no mention is made of the adventure playgrounds and playworker movement that began in the U.K. and was founded on these principles (Michaelis, 1979).

Throughout the book, the view of children and of schools that is presented and enacted is a welcome addition to the ECE literature. Children are described as socially-attuned and competent community members, and schools are prioritized as social communities more than places for individualized achievement and learning. In addition, the authors question the idea of children as future citizens, stating that "adults emphasize the importance of preparing children to participate in democracies as adults, rather than ensuring that they are part of democracies as children" (p. 53). While this perspective is not new (e.g., Dahlberg, Moss & Pence, 2007; Lenz-Taguchi, 2010) this book is able to present these ideas without heavy theorizing, which can be inaccessible to many early childhood educators and educators-in-training.

My one major critique of the book is that the Boulder Journey School is presented as an ideal early childcare centre. The book is written by the Ex-

ecutive Director of this private school and there is no critical examination of the conditions put into place that allow such reflective work to be done with children and families, nor of conflicts that arose and were resolved; the usefulness of this work for early childhood educators or teachers of young children working in less than ideal circumstances is therefore limited. There is also a lack of discussion on differentiation between children and on how the understandings of children's rights put forth by the authors could be expanded to include children with special needs and children who don't speak the dominant language.

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REFERENCES

Dahlberg, G., Moss, P. & Pence, A. (2007). *Beyond quality in early childhood education and care: Languages of evaluation* (2nd ed.). London, UK: Routledge.

Lenz Taguchi, H. (2010) *Going beyond the theory/practice divide in early childhood education: Introducing an intra-active pedagogy*. London UK: Routledge.

Michaelis, B. (1979). Adventure playgrounds: A healthy affirmation of the rights of the child. *Journal of Physical Education and Recreation, 50*(8), 55-58.

Reynaert, D., Bouverne-de-Bie, M. & Vandevelde, S. (2009). A review of children's rights literature since the adoption of the United Nations Convention on the Rights of the Child. *Childhood, 16*(4), 518-534. doi: 10.1177/0907568209344270

BOOK REVIEW / *CRITIQUE DE LIVRE*

ADRIENNE CAREY HURLEY. *Revolutionary Suicide and Other Desperate Measures: Narratives of Youth and Violence from Japan and the United States*. Durham, NC: Duke University Press. (2011). 259 pp. $24.92 (Paperback). (ISBN 978-0822349617).

In *Revolutionary Suicide and Other Desperate Measures*, Adrienne Hurley renders hyper-visible the often disavowed "culture of child abuse" in Japan and the United States. Through analysis of autobiographical fiction, tabloid journalism, film, clinical case studies and her personal experiences serving as a court-appointed special advocate for abused children, Hurley exposes how child abuse and youth violence are popularly understood as aberrant, manufactured for commercial profit, and represented as a mass mediated "freak" spectacle. In these late-capitalist societies where parental rights have eclipsed children's rights, and where teenagers are disproportionately incarcerated, it has become common sense to blame youth for their own vulnerability. Hurley effectively shifts the terms of the debate to argue that adults and the institutions that purport to "protect" children (child protective services and juvenile "correctional" facilities) are complicit in creating the conditions that engender violence. Instead of alluding to youth violence as "inexplicable," she urges readers to provide youth with opportunities to identify why they are angry, disaffected, and suicidal, and to create strategies to challenge the conditions that fuel their hopelessness.

Bridging the gap between academia and action, Hurley undertakes close readings as a form of advocacy. She speaks to those readers, critical educators and scholar-activists who can position themselves as "ally-advocates" (p. 45) in the service of children's and youth's liberation. She calls on them to disrupt both the "adult optic" (p. 11) and "unilateral adult caretaker-child relationship" (p. 33) that maintain differential power relations that structure acts of violence. Successful strategies offered from Hurley's own experiences as a youth empowerment program coordinator for criminalized youth validate her call.

Hurley (de)naturalizes violence as it is experienced by youth. She successfully counters many of the racial and class biases that blame "identity instead of

institutions" and challenges "the prevailing myths that obscure the violent conditions many youth face and offer alternative models for reading and interpreting young people's rage" (p. 4). Violence against children is, according to Hurley a daily occurrence that cuts across class and racial lines often times with impunity for the perpetuator. To prove her point, Hurley overwhelms her readers with statistics of widespread child abuse and abduction crimes throughout the United States and Japan; figures which are inaccurate due to underreporting (see p. 42; 118-119). She also documents the growing body of professional literature and comparative research about violence against children and underscores the profound cultural shift in the "abuse and recovery industries" (p. 174) marked by a popular proliferation of disclosures of trauma (such as those by adult survivors of childhood sexual abuse). Hurley underscores that "the very material and real power of storytelling to save lives is written into fiction by young women who themselves survived repeated and violent sexual assault by writing" (p. 38). The importance of storytelling for survival is demonstrated by Hurley in her extensive analysis of two autobiographical works of fiction written from the vantage point of the abused girls themselves: *Fazaa Fakkaa/Father Fucker* (1993) by Uchida Shungiku and Dorothy Allison's *Bastard out of Carolina* (1993). From the perspective of these two novelists, "fiction" can communicate that which has been suppressed and continues to be buried in nonfiction, formal discourse, and everyday conversation.

After underscoring just how endemic child abuse is and how stories of prolonged childhood sexual abuse are rendered invisible within mainstream society, Hurley argues that violent acts committed by youth cannot be attributed solely to those who are poor, non-White, or simply "crazy"; such a formulaic notion forestalls understanding. Hurley discusses Seung-Hui Cho, the student who killed 32 people and then himself at Virginia Tech in 2007 (p. 31). Sensationalized as simply "demented" by the tabloid press, Cho's experiences of physical and sexual child abuse, racism and class oppression were virtually ignored. Instead, mainstream media cited Cho's legal resident alien status as if his "foreignness" could explain his actions.

For Hurley, youth from all backgrounds are only mimicking the fear and outrage, the revanchist impulses that comprise the "dominant national feeling states" (p. 117) of the Global North in the post-9/11 era. Youth-driven responses to conditions of oppression include violence, both representational and real. In various popular cultural texts produced by young anarchists, Hurley examines how the turn to representational and political violence in these works is used to "expose the ways in which violent state policies elicit interpersonal brutality" (p. 179). Hurley examines the work of Sherman Austin, a young Black anarchist and rap artist who was arrested for "inflammatory" content on his website which provided a platform for discussion for anti-police brutality activists, and provided suggestions on how to practice for possible armed combat with police; Sherman was subsequently censored and convicted under United

States domestic terrorist laws (pp. 115-117). Like Austin, award-winning novelist Tomoyuki Hoshino is also preoccupied with how youth can and do resist state repression. Hoshino's science fiction novel *Lonely Hearts Killer* (2009) explores how marginalized youth violently challenge a new authoritarian political leadership on the ruins of the Japanese emperor state (pp. 177-214). In both of these productions, the state is identified as the greatest purveyor of violence against its people; in particular, against those radically "disaffected youth" who actively envision the death of the state and the creation of a new anti-authoritarian society.

Hurley appeals to those committed to building intergenerational movements for radical social change and transformative justice. Her interdisciplinary analysis will benefit the work of a wide range of actors, from youth advocates, teachers, and social workers to scholars in the newly emerging field of girlhood studies as well as those specializing in the sociology of youth culture. *Revolutionary Suicide* — the classic autobiography authored by Black Panther Party co-founder Huey P. Newton (1973) which shares its title with Hurley's book, as well as its parallel analyses of the necessity for revolutionary change — should also be read by youth activists who are at the forefront of organizing against both interpersonal and state violence. Ultimately, it is our responsibility to engage with youth so that they too can taste a power not driven by desperate measures such as suicidal despair or violent rage, but by revolutionary hope.

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REFERENCES

Allison, D. (1993). *Bastard out of Carolina*. New York, N.Y: A Plume Book.

Hoshino, T., & Hurley, A. C. (2009). *Lonely hearts killer*. Oakland, CA: PM Press.

Newton, H. P. (1973). *Revolutionary suicide*. New York, NY: Harcourt Brace Jovanovich.

Uchida, S. (1993). *Faza Fakkaa = Father fucker*. Tokyo, JP: Bungei Shunjuu.