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A Framework for Social Justice in Education

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Abstract

Political philosopher Nancy Fraser has developed a theory of social justice with three dimensions: Redistribution (economic), recognition (cultural), and representation (political). This article first presents Fraser's theory. Then I describe in her terms the successes and challenges encountered in four primary schools in Australia that were trying to provide educational equity for all students, especially their Indigenous students. That evidence suggests that the dimensions of redistribution and recognition are both essential for "closing the gap" in academic achievement, and that representation is important for school and community relationships.

Keywords: social justice theory, educational equity, Indigenous education, primary school curriculum

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Un Marco para la Justicia Social en Educación

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Abstract

La filósofa política Nancy Fraser ha desarrollado una teoría de la justicia social que contempla tres dimensiones: la redistribución (económica), el reconocimiento (cultural) y la representación (política). En este artículo se presenta, en primer lugar, la teoría de Fraser. A continuación se describe en sus términos los éxitos y los retos a los que se enfrentan cuatro escuelas de educación primaria en Australia, las cuales intentan proporcionar equidad educativa para todo el alumnado y especialmente para el alumnado indígena. Las evidencias sugieren que las dimensiones de la redistribución y el reconocimiento son esenciales para "cerrar la brecha" en el rendimiento académico así como que la representación es relevante para las relaciones entre la escuela y la comunidad.

Keywords: teoría de la justicia social, equidad educativa, educación indígena, currículum de educación primaria

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> At Cannes, "The Sapphires" received a 10-minute standing ovation. The film follows four young singers from a remote Aboriginal mission who entertain troops during the Vietnam War. ("Up Front", p. 24)
>
> Indigenous Australians were painted in first settlement art [mid-18th C], but then virtually disappeared until [David] Boyd and others brought them back in the 1940s and '50s, long before any related political movement. ("Spirit of Australia," retrospective celebration of David Boyd's art, pp. 35-40)
>
> Indigenous artists and tourism operators are helping to make Tropical North Queensland a tempting destination for the culturally curious. ("Art of the North", pp. 49-54).

I was surprised to find these three articles on Aboriginal topics in the August, 2012 issue of QUANTAS, the monthly magazine of the Australian national airline, in the seat pocket on my flight home after one of my periodic months as a visiting researcher at the Queensland University of Technology (QUT) in the state capital, Brisbane (Australia's third-largest city). I had been working on an evaluation of a federally-funded program to improve the education of Aboriginal students in a sample of schools—some more urban, others more remote—across the continent.[1]

I was surprised, that is, because of the Indigenous peoples of four Pacific rim countries—Australia, Canada, New Zealand and the United States—the Aborigines and Torres Strait Islanders in Australia are arguably the most oppressed and most easily ignored. Comprising 2.4% of the national population, they were only made citizens in 1967 and are the only group of the four who have never had a treaty against which claims for justice can be made. Given these facts, why would QUANTAS editors give them valuable space? Question for readers: does the inclusion of these three cultural items in a commercial publication constitute an expression of "recognition" significant for the Indigenous peoples themselves?

In this article, I will include descriptions of schools with Indigenous students, all but the first from my own observations over the past 20

years, including this recent trip, in order to exemplify a framework for analyzing efforts toward social justice in education that readers may find useful elsewhere. The "Justice" framework is the work of political philosopher Nancy Fraser and has only recently been cited in analyses of educational issues (e.g., Artiles, 2011). Her latest version of the framework has three dimensions: *redistribution* (economic), *recognition* (cultural, as in those Quantas items), and *representation* (political). More on each below, with suggested meanings in education, and then examples from observations in Australian schools.

Fraser's Dimensions of Justice

Here are Fraser's (2003) opening words on the first two dimensions:

> In today's world, claims for social justice seem increasingly to divide into two types. First, and most familiar, are redistributive claims, which seek a more just distribution of resources and wealth. Examples include claims for redistribution from the North to the South, for the rich to the poor, and (not so long ago) from the owners to the workers. To be sure, the recent resurgence of free-market thinking has put proponents of redistribution on the defensive. Nevertheless, egalitarian redistributive claims have supplied the paradigm case for most theorizing about social justice for the past 150 years.
>
> Today, however, we increasingly encounter a second type of social-justice claim in the "politics of recognition." Here the goal, in its most plausible form, is a difference-friendly world, where assimilation to majority or dominant cultural norms is no longer the price of equal respect (p.7).

Fraser (2003) goes on to argue that in today's world, both dimensions remain essential in order to solve problems that arise in either one: "In virtually every case, the harm at issue comprise both maldistribution and misrecognition in forms where neither of those injustices can be redressed entirely indirectly but where each require some practical attention" (p. 25). Fraser's argues from examples of injustices of

gender, race, and class in society at large. How might redistribution and recognition apply more specifically to injustices in education?

The educational meaning of "redistribution" is more obvious. "Resources" that require more equitable distribution certainly include intellectual matters as well as monetary. More specifically, educational recognition means ensuring access—in every school and classroom, not just in the rhetoric of policy and plans—to an intellectually rich curriculum for all students, especially those whose families and communities have been denied that access in the past. It has become all the more important today for the Indigenous people of Australia for two reasons: first, the increasing level of education required in more and more jobs (thus affecting the attainment of any monetary redistribution), and second, the cumulative intergenerational legacy of educational "deficits" that year-by-year additively become educational "debts" with historical, economic, sociopolitical and moral components (Ladson-Billings, 2006, based on US data).

The educational meaning of "recognition" is more complex. Historically, Fraser (2003) describes the rise of what is sometimes called "identity politics," where members of marginalized groups seek to counter dominant and pervasive deficit theories and practices that assume their cultures, knowledges, values, even their humanity, are of no worth. At a 1997 educational conference in Australia, two teachers at Yipirinia, an independent Aboriginal school, named such practices "*terra nullius* education"—a metaphorical extension of the dominant characterization of the land of the continent itself as "no one's land" and thus freely available for appropriation by the (originally British) settlers from 1788. This assumed legitimacy continued until the Australian High Court decided in favor of a Torres Strait Island plaintiff, Eddie Mabo, in an historic land rights case in 1992. Terra nullius education metaphorically refers to Aboriginal student minds being considered empty like the land until invaded by teachers and texts. Educational justice, by contrast, would require recognition and inclusion in the school curriculum of their histories, cultures, and knowledges.

The Australian federal government is now in the final stages of developing a national curriculum, reportedly in part to diminish variations in standards among the states (a redistributive intent). In

addition to the usual standards in each curriculum area are three "cross-curricular priorities", of which one is "Aboriginal and Torres Strait Islander Histories and Cultures" (Phillips & Lampert, 2012, p.1)—just what recognition requires.

In a separate article, Fraser (2000) suggests an alternative "social status" interpretation of recognition:

> What requires recognition is not group-specific identity but the status of individual group members as full partners in social interaction (p 4).... [Claims for recognition are] aimed not at valorizing group identity but rather at overcoming subordination.... Redressing misrecognition now means changing social institutions--or, more specifically, changing the interaction-regulating values that impede participation at all relevant institutional sites. (p. 5)

In education, both of Fraser's interpretations of recognition are useful: The *identity* meaning applies to "what" is taught, the curriculum; the *status* meaning applies to "how" it is taught, the quality of instruction, especially through all the moment-to-moment teacher-student interactions (Cazden, 2001).

Fraser (2005) added a third dimension, the political dimension of representation, when the forces of globalization made it clear that *who* was making decisions was becoming increasingly important. When transnational corporations outsource manufacturing jobs, workers' claims for redistribution through union demands lose their force. Trade treaties negotiated through the World Trade Organization can override environmental or labor laws previously passed in any of the nation states. And European readers will be all too familiar with current disputes over the austerity measures forced on national governments by regional or international organizations such as the EU or the International Monetary Fund. In all these cases, the political question of representation on decision-making bodies come to the fore.

Fraser seems to assume that such issues of representation do not arise within nation-states. It's not hard to question this assumption, for example when justice for women is still lacking in many spheres of life virtually everywhere. Moreover, with respect to the status of Indigenous

peoples, they are arguably the least adequately represented within their own countries. That is certainly still true in Australia, despite the Mabo court decision and the official "Sorry" speech of incoming Labor Prime Minister Kevin Rudd that was unanimously passed as a motion by Parliament in February, 2008. In decision-making in education, the importance of representation extends down to the school level, especially in countries where considerable authority is devolved from federal and state governments to each local public school.

In the final chapter of a new edition of a text for undergraduate students in pre-service teacher education with chapters by Indigenous and non-Indigenous authors, McLaughlin et al. (2012, p.183) present a chart of "Six types of school-community participation".

Table 1
Six types of school-community participation

Type 1	Parents support schools from home	Assimilationist
Type 2	School and home communication	Integrationist
Type 3	Schools support parents	Integrationist
Type 4	Parent and community support in schools	Delegationist
Type 5	School and community links	Delegationist
Type 6	Partnership in decision-making	Autonomous

McLaughlin et al. (2012) state clearly that "The most desirable approach to school and community participation in Indigenous education is autonomy":

> The main principle underlying the autonomous approach is the capacity to exercise the power of decision-making which requires non-Indigenous groups to surrender their historic power and so remove various pressures of dominance over Indigenous people (Heslop, 1998). Furthermore, there must be a more positive relationship between the stakeholders in education so that Indigenous and non-Indigenous people interact as equal partners,

> "where the expertise is pooled to achieve objectives that are consistent with the aspirations of community members" (Heslop, 1998). (p. 183)

With its underlying emphasis on parity of representation and participation, Type 6 fits Fraser's theory well.

Reconsider now those cultural items in the QUANTAS magazine. Instead of affecting any of Fraser's dimensions of justice, they seem more designed to benefit Quantas and the associated travel industry by showing what a diversely interesting country Australia is to explore.

Examples from Australian Schools

Four examples of programs in Australian schools show the challenges in reforming schools in order to increase the achievement of poor and marginalized minorities, especially indigenous students. The first report comes from published work of QUT colleagues; the second and third are my observations from the 1990's (Cazden, 2000) supplemented by more recent second-hand information. The fourth is from my 2012 trip. The four schools are located in three of the eight Australian 'states' and 'territories'.

A current project in Queensland

A group of colleagues at QUT (Woods et al., in press) are the first to my knowledge to use Fraser's justice model in designing their intervention in a primary school located in a low-income community within Brisbane's "urban sprawl." The 600 students are challengingly diverse, from 23 different cultural backgrounds:

- 11-15% Aboriginal or Torres Strait Islander,
- 14% from varied Pacific Islands,
- 6% meet stringent state requirements for English as a Second Language programs (primarily migrants and humanitarian refugees from Russia, Korea, Burma, the Congo and Afghanistan), plus a large proportion of all students require some form of behavioral and learning support.

Under state and federal pressure to increase their scores on annual

national achievement tests, such schools, especially in the US, often are pressured to adopt scripted programs that may get short-term gains but deskill teachers in the longer term.

Woods and colleagues rejected that strategy. Instead, "teachers and researchers worked with the 'four resources model' of literacy (Freebody & Luke, 1990; Muspratt et al., 1997), 'multiliteracies' and digital and media arts pedagogies (New London Group, 1996; Cope & Kalantzis, 2000) while building substantial links to community knowledge, locally relevant Indigenous knowledge and traditional school subject knowledge"—a plan explicitly designed to fit the first two dimensions of Fraser's justice model: redistribution and recognition. With respect to her third dimension, representation, it is not clear exactly where decisions about curriculum and pedagogy were made. But reading Woods et al's acknowledgement (in press, fn 1) of their "partners"—the School, the Queensland [state] Teachers Union, and the Indigenous community of and around the school—this reform project seems to have gone further toward inclusive participation than many.

Because of space limitations, I will only briefly recount where success came more easily and where with more resistance. Writing a progress report at the beginning of the fourth and last year of the project, Woods et al report the success of newly-created learning sites: the after-school Media Club and the Indigenous Cultural/Homework Hub "were flourishing"; there is an Indigenous language program for grades 4-7, and a cultural studies program is provided to all students by an Indigenous teacher.

But when these real successes brought no measurable achievement gains, Woods et al diagnosed the problem as too little attention to "substantive intellectual demand":

> With the principal's green light, we had a long, difficult, and somewhat prickly discussion in a staff meeting. The issue, we explained, was one...of upping the ante under the expectation that students from diverse cultural and linguistic background, some of whom were still struggling with learning basic skills, were ready and able to discuss 'big ideas'... We made an empirical case that while basic skills were necessary for improved achievement...they were not sufficient. We explained that sustained engagement and improved outcomes for the most at-risk students required

> intellectual demand, connectedness to the world, and sustained conversation [citing large-scale research in the US by Newmann et al, 1996 and in Australia by Ladwig, 2007].
>
> Some teachers began to change their curriculum in significant ways, for example working with two other QUT researchers (Mills and Levido, 2011) to bring the digital component of the project into their classroom. One teacher "shifted unit content to 'About Me' web pages"; a grade 5 teacher had her students create videographies of "'healthy places' in our community". At one point, the teacher commented to the researcher, "You should hear the discussions we're having now, the questions they're asking, and their understandings of the world."

As Woods et al. (in press) make clear, Fraser' s recognitive dimension is here serving both as an end in itself and as a means to more effective redistributive dimension also. But for other teachers, "who displayed recognitive dispositions in their approach to engaging students, it continued to be more difficult to make these elements central to curriculum content selections" (Woods et al., in press). One Year 1 teacher welcomed "expressions of diverse linguistic and cultural identities" (Woods et al., in press) in the daily morning routines or during breaks and after school, and she was one of the most frequent teacher visitor to the weekly Indigenous Culture/Homework Hub. But "a redistributive focus on explicitly teaching dominant linguistic resources did take precedence over building on the skills and experiences that the young students brought to the classroom" (Woods et al., in press),

> Her concern was with the capacity of her students, who spoke culturally and class-inflected variants of English, to produce standard Australian English in high-stakes school literacy tasks... As the term progressed, the focus sharpened on topic-specific vocabulary and the schematic structure of the narrative genre... Results on assessment items demonstrated that most of the students in the class seemingly understood and could use the metalanguage for describing narrative structure. The teacher reflected that she hadn't *"dumbed it down...."*

> In short, while pursuing redistributive goals in a high-stakes accountability environment, the teacher's approach had raised an aspect of the intellectual quality of her pedagogy, and was challenging deficit discourses....But the project sought also to encourage more substantive and respectful links to the students' communities and outside class lives, while upping the ante on substantive disciplinary content and on the inclusion of local and global issues of importance (Woods et al., in press).

Yet, all this time, the medium of this otherwise successful literacy work was a preplanned unit on the decontextualized topic of pirates.

In relating this episode, with the teacher's disappointing retention of the unit topic of pirates, these QUT researchers set a very high standard for implementing school reform in accord with Fraser's model. My remaining three examples illustrate other challenges.

Yirrkala in East Arnhem Land (Northern Territory)

During the 1990's, I had the chance to visit Yirrkala Community School in the Northern Territory, the Australian state that has the highest proportion of Indigenous peoples. Yirrkala is a small community of Aboriginal Yolngu people, 18km from a large mining town. My description here combines 15-20 year-old memories with current Wikipedia entries. The community is well-known, partly because of its leadership in earlier land-right struggles, notably the 1963 petition written on a piece of their traditional bark painting presented to the Federal government to protest the announcement that a portion of their land was to be sold to a mining company. While that fight was lost, its publicity helped prepare non-Indigenous Australia for the highest court's MABU decision 30 years later. On my first visit in 1991, the principal of the school was Manduwuy Yunupingu--a member of one of the most prominent land rights families. By the time of my second visit, he had left the school to found the Yothu Yindi rock band that became internationally known, especially for their political anthem, "TREATY".

At least in the '90's, Yirrkala organized its curriculum around a metaphor of the contact zone where the local river meets a gulf of the Pacific Ocean—*estuary* in English, *ganma* or *garma* in Yolngu dialects. Flying west in a small plane from Yirrkala to Darwin after one visit, I could see clearly the swirling colors in the *ganma* waters: bluer from the sea, browner from the river. Metaphorically, *ganma* is where cultures

meet: fresh water is the Indigenous Yolngu knowledge and practices, tidal sea water is the white 'Balanda' knowledge; and one place where they meet is the school. (Manduwuy described his bi-racial Yothu Yindi rock band as a similar ganma mix of popular and traditional cultures of music and dance). Much of the school curriculum was taught in Yolngu, and there was at least an experimental attempt to devise a math curriculum based on abstract patterns in the Yolngu kinship system.

In Fraser's terms, I would now say that Yirrkala was strong in recognition but not in redistribution. If the two strands can be kept in balance in the *ganma* space, then the resulting mix nourishes richly diverse forms of life--biological in the literal space, intellectual in the metaphorical. Such intellectual richness is just what Woods et al and their partners worked hard to try to create in that Queensland school, and explains their disappointment when that Grade 1 teacher taught her otherwise valuable redistributive justice literacy unit around the intellectually impoverished topic of pirates.

Traeger Park School (also in the Northern Territory)

Traeger Park primary school existed in Alice Springs until it was closed by the NT Department of Education in 1991. I can speak knowledgably about only one part of the school's success: what was then called 'Concentrated Language Encounters' (CLE) developed by Brian Gray with Traeger Park teachers in the 1980's. At that time, the students were about 75% Aborigines; later the percentage was close to 100. My account draws on Gray' writings (1985, 1990) and Gray and Cazden (1992), talks with him and two Traeger Park teachers, Sue O'Callaghan and Fiona McLaughlin, and observations in their classrooms in 1991, at the height of the tragically failed campaign to save the school. One indication of the school's success was the remarkable student attendance, a chronic problem reported in other Aboriginal schools. Even in its final term, attendance in the two classrooms I visited was 22 out of 25 and 19 out of 22.

CLE was designed to create activity structures and then discourse structures in which the children could come to understand how language (here meaning the language of mainstream education, English)

is used in the classroom to negotiate school learning. The activity structures were designed as condensed forms of familiar interactional and discourse structures, and often involved role-playing in small groups so participation of each child was ensured, with the teacher as the only 'native speaker' of the contextually-required discourse participating in role.

So, for example, in a curriculum unit on health, the children took trips to the Aboriginal Health Centre, Hospital, and Ambulance Brigade in Alice Springs, and the Visiting Nurse visited the class. 'Transactional' genres such as patient records and receptionist memos were practised in role plays; narratives of accidents or treatments were negotiated by teacher and children after the role plays, emphasizing event sequence; factual reports were similarly negotiated to summarize important learnings. Although the CLE program had only been developed through the 3rd grade, teachers of older students created their own extensions. In 1991 when I visited, Fiona McLaughlin was teaching a unit on the law to her sixth and seventh graders. They had sat in on court sessions; a local Aboriginal woman lawyer had visited the class; and they had role-played examples of legal discourse.

Two CLE features went beyond more typical language experience and role-playing activities. One was the repeated experiences the students have with significant curriculum knowledge through which they develop a foundation for speaking and writing about it with authority. Second was the active role of the teacher, both within the role-playing, and then by scaffolding, modeling, and giving explicit instruction in the oral and written discourse structures in which that knowledge is conventionally expressed.

CLE activities were designed for only one part of the *ganma* metaphor and only one dimension of Fraser's justice model: the redistribution of access to dominant discourse and literacy. I was told about a complementary recognition of Aboriginal presence in the Traeger Park curriculum, but Gray was firm that the goal of his program was only the first —in this respect in contrast to Woods et al.'s more integrated justice goals.

Gray's program is now used in more Australian schools, but with changes. Gray renamed it Accelerated Literacy, in recognition of the

rarely acknowledged fact that in order for any achievement 'gap' to be closed, the under-achieving students have to learn *faster* than the rest[2] (more on that "In conclusion" below). Gray himself has since retired, and so has his original co-designer, Wendy Cowey, but there is still a website for the National Accelerated Literacy Project.

For a few years Gray and Cowey collaborated with David Rose, a linguist from Michael Halliday's functional grammar group at the University of Sydney and Rose has now developed a conceptually-related but organizationally separate program he calls Reading to Learn[3]. One major difference is that the base in concentrated language encounters has been dropped in favor of texts that have more complex language for students to work with (Wendy Cowey, telephone communication, 2012).

Finally, Fraser's political dimension of representation and parity of participation in decision-making became crucial for both Traeger Park and Yirrkala. In the early '90's the Northern Territory government closed Traeger Park, despite high attendance figures and strenuous community protests. The Aboriginal community of Yirrkala has its own governing structure, the Nambara Schools Council that "represents the people of the Yirrkala area in decision-making about the operations of both the Yirrkala Community Centre and the Yirrkala Homelands Schools" [which includes the community school that I visited and satellites for children whose families have moved to more remote homelands] (Nambara Schools Council, 1999). But it does not control the financial resources that those operations require. The first section of its 1995 submission to the federal Human Rights Commission is about "Affirming rights to Bilingual education programs." The Northern Territory had had a widely acclaimed bilingual education program, encouraging instruction in both Aboriginal languages and English:

> We are specifically indicating our concern about the likelihood of the removal of resources integral to providing the necessary support for the Bilingual education Program at Yirrkala and in other communities in the Northern Territory.

> It is important to highlight that this submission is in direct response and opposition to the Northern Territory's decision of December 1, 1998, to replace the well-established Bilingual Education programs in Indigenous schools with English as a Second Language (ESL) English-only Program (Nambara Schools Council, 1999, p.2).

These examples indicate the importance of that third representation dimension for the success of redistribution and recognition dimensions as well.

A primary school in South Australia

As mentioned, I visited a school while in Australia this past August. A QUT colleague and I spent four days in a primary school in a country town in South Australia, on the edge of the dessert that covers much of the continental interior. Official statistics show the school as 70-80% Aboriginal; the principal told us many times that the students are "virtually all" Aboriginal and that's who they plan for. We saw deliberate efforts by the principal and her committed staff in the direction of all three justice dimensions.

Even before we arrived, the principal had e-mailed that they were developing a "systematic and integrated" literacy curriculum for the whole school, and mentioned again during our visit the children's need for "basic skills.", redistributive justice in education. During our visit we observed a consultant working with all teachers and then some children on one component--spelling. After his visit, we sat in on the staff meeting at which the teachers discussed with exemplary commitment and professionalism how they would carry on what they had learned. The reading and writing components are contracted with another consultant for help with Accelerated Literacy (AL), the outgrowth of Gray's work in Traeger Park. While that program is designed for whole-class teaching, we also saw students grouped by reading ability for “guided reading".

Undoubtedly, many of these students do need work on basic skills. But our snapshot observations at this point in the curriculum's development give cause for concern. Each component is being taught

separately. With the exception of the AL text, no other text longer than a sentence was in use, and no one read a story to even the youngest pre-primary children. The curriculum uses predominantly decontextualized sounds (for phonics), words (for spelling) and unconnected sentences (for grammar). No one mentioned a potential problem of contrasting principles of sequencing among the various component programs. For example, Accelerated Literacy begins with texts of paragraph length followed by sentences, clauses and phrases, words and then sound/letter correspondence last, while the phonics program is designed in the (more typical) opposite direction. The value of "explicit instruction" was frequently mentioned, but one wonders what is being made explicit: only the visible or audible behavioral objectives or also underlying cognitive understandings and applications.

The principal was clear about her goals, but I can only report here what we saw: any "systematic integration" of the literacy curriculum is left for the students themselves to work out, and the "intellectual demand, connectedness to the world, and sustained conversation" recommended by Woods et al. for that first school in Queensland are also missing here.

This South Australian school is making significant efforts to recognize their students' Aboriginal histories and cultures. An Aboriginal language program is scheduled once a week for each grade. It is taught by a credentialed Aboriginal teacher, and classroom teachers attend with their students so they can encourage use of the language at other times. There is an Aboriginal Educational plan for the school that requires all teachers to infuse these perspectives throughout the curriculum and once each year carry out a 4-week "cultural" unit. The principal and vice-principal are aware that less than half of the teachers had carried out such a unit at the time of our visit in the second half of the academic year, despite offers of help and resources from the Aboriginal staff, and they all vow to be firmer about this commitment in 2013.

Some of the responsibility for preparing teachers to take on this commitment rests with pre-service teacher-training programs. In their recent survey of a national sample of Australian teachers' knowledge and classroom practice, five QUT colleagues report:

> Low levels of knowledge of Indigenous cultures, and limitedencounters outside of school. [E]xposure to pre- and in-service courses in Indigenous education correlated with higher levels of cultural knowledge and cultural engagement. Teachers with higher levels of cultural knowledge were more likely to attempt to integrate Indigenous knowledges in curriculum and pedagogy" (Luke et al., 2012 ms).

In other words, those teacher training programs could make a difference in how this national curriculum requirement is carried out.

During our visit, we also learned about one of the ways in which parents and other adult members of the Aboriginal community participate in school governance. We interviewed the Aboriginal chair of the Governing Council (mother of two daughters—one now in secondary school, one still here) and sat in on the monthly Council meeting she chaired. The principal, in words and attitude, treated the group with genuine respect, handing out copies of her monthly report, and encouraging discussion. Evidently, student initiatives are routed through the Council for initial discussion. Two recently carried out by students themselves brought brightly painted doors to the student bathrooms, and gift t-shirts for students with perfect attendance that had a student-composed (super-positive) message on the back: "It's deadly cool to attend school".

In conclusion

So far, nothing specific has been said about the goal of all this work—not in Fraser's framework nor in the four schools' efforts. What should it be? "Closing the gap" of course, but what does that mean? The OECD offers one answer in their (2011) comparative analysis of "social justice" in 31 OECD (European and non-European) countries. One dimension (given extra weight in the composite index because of its special importance) is "access to education", and one measure of "access" is the correlation between students' socio-economic background and their academic achievement. In the ranking from best (lowest correlation) to worst (highest correlation), Australia is #25th out of the 31, worse than Canada, New Zealand and the United States, the other Pacific Rim countries with Indigenous populations.

What can be said about a goal more salient to educators' work? Certainly not that all students will receive grades of A or a score of "proficient"; we needn't try to eliminate all individual differences. When the principal of still another Australian school, a large secondary school with 12% Indigenous students was interviewed by a QUT colleague, he expressed one concrete goal worth adopting: matched distributions of Indigenous and non-Indigenous students across achievement-level classes. In his words,

> [I]f you've got 10% of your Indigenous kids in your senior school, then you should have 10% of your kids in physics and 10 % of your kids in chemistry and "authority English". That's just got to be the expectation around that rather than populating with more Indigenous kids in "English communication".

McNaughton (2011) combines the goals of “acceleration” (as in Gray’s program) and “matched distributions” (as the high school principal understood) as what "being effective" requires. Here are his words, with my interpolated Indigenous application:

> The criteria of acceleration and building matched distributions provide both developmental and equity criteria. They are tough but transparent, and require a demonstration that the distribution of achievement has been altered for the [Indigenous] group of students such that there is the same probability for them as for any other child for being in any part of the distribution (high, medium, or low) (p.72).

At the end of his next paragraph, McNaughton (2011) adds, “From what we have learned from the international evidence that is clearly a daunting challenge” (p.72). More optimistically, all efforts toward this goal are worth while.

Notes

[1] This work was supported by funding from the [Australian] Commonwealth Government Department of Employment, Education and Workplace Relations for the evaluation of the Stronger Smarter Learning Communities project 2009-2013. In Australia, the more inclusive term Indigenous refers to both Aboriginal peoples native to the continent itself and to the Torres Strait Islands peoples native to islands off the north-east coast.

[2] A new book by New Zealand literacy researcher Stuart McNaughton, 2012, analyses what it takes to accomplish this too-glibly stated policy objective.

[3] His website gives access to many published references.

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Can Collaborative Knowledge Building Promote Both Scientific Processes and Science Achievement?

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Can Collaborative Knowledge Building Promote Both Scientific Processes and Science Achievement?

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Abstract

This study investigated the role of collective knowledge building in promoting scientific inquiry and achievements among Hong Kong high-school chemistry students. The participants included 34 Grade 10 (15-16 years old) students who engaged in collective inquiry and progressive discourse, using Knowledge Forum®, a computer-supported collaborative learning environment. A comparison class of 35 students also participated in the study. The instructional design, premised on knowledge-building principles including epistemic agency, improvable ideas and community knowledge, consisted of several components: developing a collaborative classroom culture, engaging in problem-centered inquiry, deepening the knowledge-building discourse, and aligning assessment with collective learning. Quantitative findings show that the students in the knowledge-building classroom outperformed the comparison students in scientific understanding with sustained effects in public examination. Analyses of knowledge-building dynamics indicate that the students showed deeper engagement and inquiry over time. Students' collaboration and inquiry on Knowledge Forum significantly predicted their scientific understanding, over and above the effects of their prior science achievement. Qualitative analyses suggest how student's knowledge-creation discourse, involving explanatory inquiry, constructive use of information and theory revision, can scaffold scientific understanding.

Keywords: knowledge building, scientific inquiry, collaboration, technology-mediated learning.

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¿Puede la construcción colaborativa del conocimiento promover los procesos científicos y el rendimiento en ciencias?

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Resumen

Este estudio investigó el rol de la construcción colectiva del conocimiento en la promoción de la indagación científica y de los resultados entre estudiantes de química de instituto de Hong Kong. Las y los participantes fueron 34 estudiantes del décimo curso (15-16 años) que participaron en indagación colectiva y discurso progresivo, utilizando el Foro del Conocimiento®, un entorno de aprendizaje basado en el ordenador. Una clase de comparación de 35 estudiantes también participaron en el estudio. El diseño instruccional, bajo las premisas de principios de construcción del conocimiento incluyendo la agencia epistémica, ideas improbables y conocimiento comunitario, consistieron de muchos componentes: el desarrollo de una cultural de aula colaborativa, participación en la investigación centrada en problemas, profundización en el discurso constructor de conocimiento y alienar la evaluación con el aprendizaje colectivo. Los resultados cuantitativos muestran que las y los estudiantes en el aula de construcción de conocimiento rindieron por encima de las y los estudiantes del grupo comparativo en la comprensión científica con efectos sostenidos en la evaluación pública. Los análisis de la dinámica de construcción de conocimiento indican que las y los estudiantes mostraron una implicación e indagación más profundas a lo largo del tiempo. La colaboración e indagación de los y las estudiantes en el Foro del Conocimiento predijeron de forma significativa la comprensión científica de las y los estudiantes, por encima de los efectos de su previo rendimiento en ciencias. Los análisis cualitativos sugieren que el discurso de creación del conocimiento de las y los estudiantes, que incluye indagación explicativa, revisión de la teoría y uso constructivo de la información, puede andamiar la comprensión científica.

Palabras clave: creación de conocimiento, indagación científica, colaboración, aprendizaje mediado por la tecnología

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It is now widely accepted that students need to work together to engage in collaborative inquiry and scientific discourse, and to develop the practice of scientists when they are involved in learning science (Scott, Asoko & Leach, 2007). Despite much enthusiasm, science learning is often reduced to surface forms of constructivist learning, with students busily engaged in gathering information from the web and completing predetermined tasks (Scardamalia & Bereiter, 2006); scientific inquiry is often limited to sequences of activities and fixed standards that focus on isolated skills rather than authentic inquiry (Chinn & Malhotra, 2002). The real goal of science for the creation of knowledge remains to be investigated, along with how knowledge-creation can be integrated with school curricula and assessment in classrooms.

Although it is widely recognized that students need to engage in discourse in science learning, less attention has been paid to how the learning environment can be designed to foster scientific understanding mediated by collective discursive practice and in particular, how it can address multiple goals of scientific inquiry, and discourse practice and school science. The possibilities for developing scientific inquiry mediated by technology merit investigation; at the same time, there is also a need to examine how students can learn the science concepts required by school curricula while working as communities of scientists to create new knowledge and improve their scientific practice. This study reports on an approach that is based on knowledge building, mediated by a computer-supported collaborative learning environment called Knowledge Forum® that focuses on students working collaboratively as members of a scientific community advancing the frontiers of their knowledge.

A major research strand regarding collaborative learning is the use of computer-supported collaborative learning (CSCL) environments (Stahl, Koschmann, & Suthers, 2006). An influential example of an educational model using CSCL technology is "knowledge building", also known as knowledge creation, which is defined as "the production of knowledge that adds value to the community" (Bereiter & Scardamalia, 2010; Scardamalia & Bereiter, 2006). This model of knowledge building postulates that knowledge advancement is the collective work of a community, analogous to scientific communities, and that knowledge is

improvable through discourse (Bereiter, 2002; Scardamalia & Bereiter, 2006). Knowledge building has been characterized as "knowledge creation", a third metaphor for learning (Paavola, Lipponen, & Hakkarainen, 2004) that integrates the "knowledge-acquisition" (cognitive) and "participation" (situated) learning metaphors (Sfard, 1998). While knowledge building is now an increasingly popular term in the education literature, this model goes beyond students sharing and co-constructing joint understanding, often in group settings; it emphasizes "collective cognitive responsibility" and collective practices of the community to advance the community knowledge.

Knowledge Forum™ (see www.knowledgeforum.com), consisting of a multimedia database, constructed by students themselves, was designed to support collective knowledge advances and progressive discourse (Scardamalia & Bereiter, 1994; 2006). In knowledge-building communities, students make progress not only in improving their personal knowledge, but also in developing collective knowledge through progressive inquiry. When learning science in a knowledge-building classroom, students use Knowledge Forum to pose cutting-edge problems, generate theories and conjectures, search for scientific information, elaborate on the ideas of others, and co-construct explanations, thereby collectively revising and refining their ideas.

Learning science is difficult because students often have to tackle information that is different from or contradictory to what they believe. Many students experience conceptual difficulties in understanding the various levels (macroscopic, microscopic and symbolic) of scientific knowledge, and develop alternative conceptions in the complex process of learning (Treagust, Chittleborough & Mamiala, 2003). Research has placed increased emphasis on student agency and epistemology; research into intentional conceptual change, for example, postulates that such changes need to be regulated and controlled by students (Sinatra & Pintrich, 2003). This study proposes that knowledge-building pedagogy that emphasizes students' epistemic agency and social metacognition will foster their scientific understanding, because when they collaborate to build knowledge, they have opportunities to reflect on their beliefs and understanding by comparing the beliefs and models of others with their own. Conflictual views can be identified and resolved collaboratively when students are working as a community of inquirers.

Further, when knowledge is constructed through discourse among student participants, students may understand better that knowledge is not handed down by authority, and will have opportunities to reflect on the nature of science and sources of knowledge.

Various studies have investigated the knowledge-building dynamics of how knowledge building can support scientific understanding and knowledge creation (see review, Chan, 2012; Caswell & Bielaczyc, 2001; van Aalst & Truong, 2011). Oshima, Scardamalia and Bereiter (1996) investigated differences among students with high- and low-conceptual progress and identified the importance of problem-centred knowledge. Hakkarainen (2004) analyzed the written productions of young students in physics posted onto a CSILE database (*Computer-Supported Intentional Learning Environment, the earlier version of Knowledge Forum*). These young students engaged in epistemological inquiry and pursued explanation-driven inquiry with some moving toward theoretical scientific explanation. Van Aalst and Chan (2007) examined how students' collective assessment and meta-discourse using knowledge-building portfolios can scaffold their conceptual understanding in high-school science. Zhang, Scardamalia, Reeve and Messina (2009) examined the socio-cognitive dynamics of knowledge building by investigating the collective cognitive responsibility of fourth-grade students in advancing their science knowledge.

Although there has been major progress in research on knowledge building, there is still a need for stronger empirical evidence to support the role of collective knowledge building in students' scientific understanding. In comparison with other inquiry models, knowledge building emphasizes the complex dynamics of scientific inquiry and there may be concerns that science content in school curricula may be neglected. In particular, since this model of knowledge building emphasizes collective and community advances, it is useful to examine whether it has educational benefits for individual students and how knowledge-building dynamics may contribute to the effects. While many studies in the knowledge building literature have been conducted among elementary school students, this study examined high-school students learning chemistry in Hong Kong classrooms, with a comparison group, to investigate how the knowledge-building approach

and discourse affect students' scientific understanding. Teachers and educators may also be interested to see whether the increasingly popular inquiry-based approach to learning science, in this case knowledge building, has an effect on standardized tests and assessments used in public examinations. As the knowledge-building model is implemented increasingly in different countries, it would also be of interest to examine how the approach works with students in different cultural settings, and in particular in educational contexts that emphasize teacher-centered approaches and examinations.

Accordingly, this study investigated knowledge building and scientific understanding among a group of Grade 10 students (aged 15-16 years) studying chemistry in a high-school classroom in Hong Kong. The research questions are: (1) Do students involved in knowledge building perform better on chemistry assessment tasks based on the school curricula than do their peers? (2) How do knowledge-building activities predict students' scientific understanding? and (3) How do students engage in knowledge-building discourse and how might it foster their scientific understanding?

Methods

Participants

The participants were thirty-four students in a knowledge-building class and another thirty-five students in a comparison class attending a Grade 10 (15-16 years old) chemistry course at a Hong Kong Catholic girls' school. Students had a high-average ability and English was the medium of instruction in their classrooms. The students studied using English and wrote on Knowledge Forum in English. The comparison class studied the same chemistry curriculum during class; after school, while the knowledge-building students wrote on the forum, the comparison class worked on text-book exercises. Students in both classes had similar academic achievements and were taught by the same teacher.

The Classroom Setting

Both classes were taught using the chemistry curriculum determined by the Education Bureau (Ministry of Education) in Hong Kong. The

teacher designed the learning environment, integrating the school curriculum with knowledge-building pedagogy. Primarily, the goal was to engage students to interconnect abstract concepts in chemistry on the macroscopic, microscopic, and symbolic levels. The study lasted several months (Jan-August) and had three periods: *Phase 1:* Initial Use of Knowledge Forum (Jan-Feb); *Phase 2:* Full Use of Knowledge Forum (March-April); and *Phase 3:* Use of Knowledge Forum after School Examinations in the Summer (July-August). Usually schoolwork finishes at the end of the academic year, which is followed by the summer holidays. In this study, the knowledge-building class continued to work beyond the end of term and into the summer months. They continued their collaborative inquiry, mediated by Knowledge Forum, despite the absence of the teacher.

Principle-Based Instructional Design

The design of the knowledge-building environment was premised on a set of interrelated knowledge-building principles (Scardamalia, 2002), and several key principles, including epistemic agency, improvable ideas, constructive use of authoritative information, and community knowledge, that inform the classroom design. "Epistemic agency" is a principle that focuses on having students take high-level agency charting their own inquiry; the principle of "improvable ideas' focuses on students viewing ideas as objects of inquiry that can be improved continually; "constructive use of authoritative information" emphasizes students using new information as resources to refine their theories; and "community knowledge' focuses on collective inquiry and advances in collective knowledge. While there were different classroom activities, the design emphasized developing a knowledge-building culture with students taking collective cognitive responsibility. Based on other studies conducted in Hong Kong classrooms, different components were included (Chan, 2008; Lee et al., 2006) and described as follows:

Development of a collaborative classroom culture. Before the implementation of Knowledge Forum, all of the students were provided with learning experiences to help create a collaborative knowledge-building culture. Classroom activities such as jigsaws, collaborative

concept mapping and group-based scientific inquiry experiments may be commonplace now in science classrooms; in this study, the focus was placed on helping students to put their ideas to the forefront, and these ideas are public artefacts that can now be open to inquiry and improvement through students' collective efforts. Students own their problems and inquiry with *epistemic agency* and they work for collective advances in *community knowledge.* Through these principles and design activities, the students began to acculturate to the knowledge-building practice of asking productive questions, putting forth theories for revision and solving complex problems. They also activated their prior knowledge and articulated the abstract and particulate nature of chemistry concepts.

Collaborative problem-centered inquiry. The teacher worked with the students and designed the Knowledge Forum views to promote knowledge building and aligned *authentic problems* with the school curriculum (e.g., acids and bases, neutralization) (Figure 1). Several views (discussion areas) were created, based on scientific or everyday issues (e.g. the nature of 2-in-1 shampoo), and the students engaged in inquiry into authentic problems. Knowledge Forum supported epistemic agency and metacognition by having the students work with scaffolds (metacognitive prompts, e.g., "I need to understand", "My theory"). A key principle was that the students viewed *ideas as improvable* as they generated questions, posed alternative theories and hypotheses, brought in new information, considered different students' views, and collectively advanced their community knowledge. Problems emerging from the computer discourse were discussed in class, and several emergent problems, such as the chemistry of bleach and antiseptic alcohol, were formulated by the students. These ideas were integrated with their prior knowledge of chemistry concepts and were aligned with the topics in the chemistry curriculum.

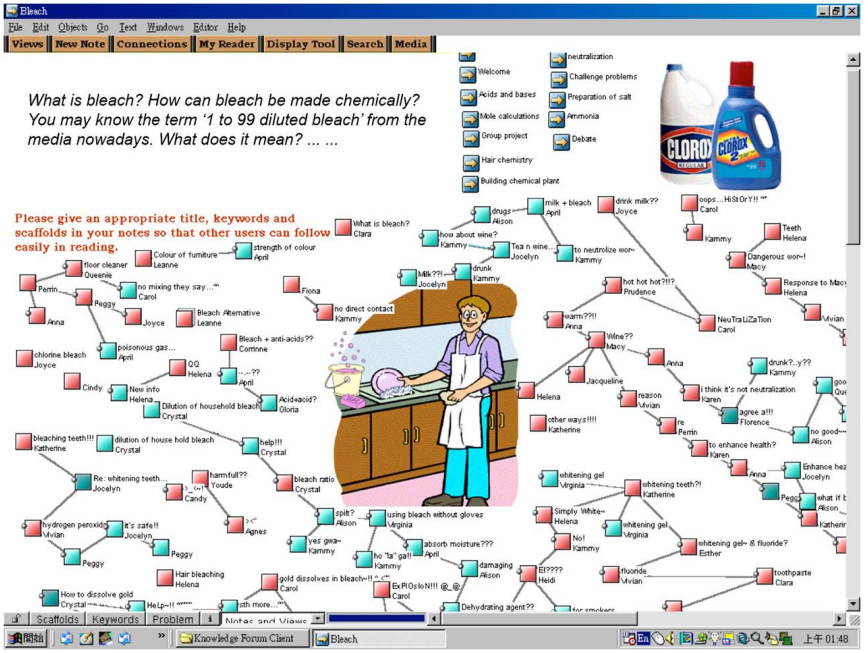

Figure 1. A view on Knowledge Forum illustrating students' collective inquiry.

Rise-above and deepening the knowledge building discourse. As the unit continued, there were many more notes in the database but the discussion could be fragmented and scattered. Knowledge Forum designs support higher-level themes (theories) emerging from diverse ideas as students pursue idea improvement and deepening of the discourse. Over time, the teacher worked with the students to identify sub-themes, note clusters, and questions that needed further inquiry and revision. Note clusters were moved into rise-above views to help focus and extend the collective inquiry. Primarily, students worked collectively to deepen their inquiry through examining productive ideas and inquiries, scaffolding emergent discussions and theory refinement. Online and offline discourse worked together as students engaged in meta-discourse in knowledge-building classroom talks.

Concurrent and transformative assessment. Rather than focusing on teacher-led assessment, this principle emphasizes assessment as concurrent, embedded and transformative for students' knowledge

building. The students reflected on their work and assessed the knowledge-building discourse, noting high-points in their knowledge advances. Specifically, the students had to select and write a reflective summary of four notes to assess the knowledge advances they had made, guided by the knowledge-building principles. Such reflections helped to promote a metacognitive understanding of their own knowledge building process and were rated and attributed as part of the course assessment.

The knowledge-building and comparison students both studied the same curriculum during the semester. However, whereas the Knowledge-Building students wrote computer notes after class, the comparison class students were asked to work on textbook exercises and problems after class.

Measures

Forum participation. Student participation, interaction and collaboration on Knowledge Forum was assessed using server log information via the software program called the Analytic Toolkit (ATK) developed by the Knowledge Building Research Team at the University of Toronto (Burtis, 1998). The Analytic Toolkit provides a wide range of indices to show participation and collaboration in Knowledge Forum, and we reported several common ones used in the literature: (a) the number of "note contribution" (notes written); (b) the percentage of notes "read" that reflect community awareness; (c) the number of "scaffolds" as metacognitive prompts (e.g., *I need to understand, my theory, a better theory*); (d) the number of "note revisions" that reflect recursive processes; (e) the percentage of notes with "keywords" to help other members identify and access notes; (f) the percentage of notes "linked" that refer to notes that build onto and notes that make references to other notes. The ATK measures have been used in numerous classroom studies and have been validated in other knowledge-building research studies (Chan & Chan, 2011; van Aalst & Chan, 2007).

Question asking and epistemological inquiry. How questions are posed is an important indicator of epistemological inquiry, as it reflects how students view ideas as objects of inquiry in knowledge building

(Hakkarainen, 2004). In this study, we examined all of the questions in this chemistry database. Different levels of questions emerged, resulting in a five-point scale characterizing responses ranging from fact-finding questions to explanatory and scientific-inquiry based questions. The scale development was based on earlier work on knowledge building (Chan, Burtis, & Bereiter, 1997) and epistemological inquiry (Hakkarainen, 2004) and the rating of student questions on Knowledge Forum (Lee et al., 2006). Examples of different levels of questions are included in the descriptions that follow. In this study, a second rater scored 30% of the responses and the inter-rater reliability based on Pearson correlation was 0.71.

Level 1 - Simple questions. Questions at this level sought a single piece of information, usually of fact-finding types. These questions were usually of the simple "what" and "yes/no" questions: "What pH do sweets have?" (#102), "What is ammonium sulphate?" (#29).

Level 2 - Simple questions with personal non-scientific guesses. Questions at this level were similar to those in Level 1 but they included some personal presuppositions: "But is the damage as serious as using dye to dye your hair? I think lemon juice is not that strong as those dyes...." (#31).

Level 3 - General information-seeking questions. These questions sought general information about a topic, and were usually of the "how" and "what' variety: "What happens if concentrated acids react with metal carbonates/hydrogen carbonates???" (#67).

Level 4 - Explanation-seeking questions. Questions at this level sought explanations about a problem:

> Many home computers use ink jet printers. The print head works by squirting minute droplets of ink at the paper. This ink must be liquid before squirting but must not smudge or rub off once on the paper.

> How do we explain ink jet printing involving neutralization? (#262)

Level 5 - Scientific conjecture or theory-seeking questions. Questions at this level identified areas of conflict and put forth some plausible conjectures. Some may also have been questions that identified conflicts between ideas, or between conjectures and events, or that had the potential to modify current views,

> A website said that "If you have swallowed some bleach, drink milk so as to counteract the effect of NaOCl in the body through neutralization." Does it work?? But milk is slightly acidic, will chlorine gas evolve in our stomach?? It seems very horrible! Actually is egg acidic? So is the same reason implied? (#82)

Scientific understanding. At the end of the semester, students from both the Knowledge Building and comparison classes were assessed by an examination in chemistry consisting of questions designed to probe their conceptual understanding of chemistry based on the school curriculum. The students had to apply knowledge and explain new phenomena. The examination consisted of both forced-choice questions and open-ended questions, related to the curriculum and for examining scientific understanding. The students were also asked some unfamiliar questions that required them to show a good understanding of relevant chemistry concepts. As an example, one question asked, “A student tested the pH of two aqueous solutions, hydrochloric acid and ethanoic acid. She found that both had a pH 4. She concluded that the two acids were equally concentrated and also equally strong. Do you agree? Explain your answer.” This question tested the students’ understanding of the concepts of strength (strong or weak) and concentration (dilute or concentrated) of the acids. We also examined the students’ public examination results as a delayed posttest to investigate whether working on knowledge building had affected their performance in science.

Results

We first examined the effects of the knowledge-building environment on the students' scientific understanding followed by analyses of how knowledge building dynamics may have contributed to their scientific understanding.

Effects of Knowledge Building on Scientific Understanding

An ANOVA showed no differences between the two classes in their prior achievement scores in Grade 9 chemistry. The mean scores for scientific understanding for the Knowledge Building class and the comparison class after the program were 80.6 (12.4) and 70.1 (13.3), respectively (SD in parentheses). An ANCOVA that controlled for prior chemistry achievement showed a significant difference in scientific understanding between the two classes, F (1, 67) = 18.73, $p<.01$, suggesting the knowledge-building students outperformed the comparison students.

We also examined the performance of the two classes in the public examinations taken one year later as a delayed posttest to investigate the effects on science achievements and to test whether the students' understanding was sustained. We translated the letter grades into numeric values (A=5, B=4, C=3, D=2, E=1) and the results show that the Knowledge Building class obtained an average score of 3.8 (1.1) in the public examinations, while the comparison class obtained an average score of 3.5 (1.3). Thus, although the two classes had similar achievements in chemistry when they started Form Four (Grade 10), the knowledge-building students had obtained significantly higher chemistry scores at the end of Form Four, and continued to perform better at the end of Form Five (Grade 11) in public examinations.

Student Contribution in Knowledge Forum and Changes Over Time

To investigate knowledge-building dynamics and their possible effects on scientific understanding and achievements, we examined the students' contribution to Knowledge Forum and how these changed over time. The results from the Analytic Toolkit showed that the overall

degree of student participation in Knowledge Forum was high, with each student creating, on average, 40.6 (17.0) notes and reading 66% of all notes. The percentages of notes *linked* and notes with *keywords* were also high (77% and 74% respectively), suggesting a high degree of interaction in the Knowledge Forum discussions. Although there is no norm against which to make a direct evaluation, comparisons with student participation levels in other computer forum discussions (Lipponen et al., 2003) indicated that the students were participating actively in this knowledge-building community.

We examined changes in the students' participation over three periods of Phase 1, Phase 2, and Phase 3 (Table 1). A MANOVA showed significant differences in ATK indices across all three phases, suggesting change over time. Post-hoc tests showed significant differences in all ATK indices, indicating gains in participation and collaboration from Phase 1 to Phase 2. Between Phases 1 and 3, post-hoc tests also indicated significant gains in the number of notes created and the percentage of notes linked. Taken together, there was significant growth in ATK indices from Phase 1 to Phase 2, and various indices were higher in Phase 3 compared to Phase 1.

Table 1
Participation and Collaboration in Knowledge Forum Over Time

	Phase 1	Phase 2	Phase 3
# of notes written	3.7 (5.7)	26.0 (13.5)	10.9 (8.4)**
# of revision	0.5 (1.5)	2.7 (4.2)	2.1 (3.2)*
# of scaffolds	0.7 (1.2)	3.3 (5.5)	1.5 (3.7)*
# of problems	2.1 (3.1)	9.6 (6.4)	3.1 (3.5)**
% of notes read	43.2 (37.1)	72.6 (30.2)	42.8 (35.1)**
% of linked notes	30.8 (41.7)	77.5 (21.1)	58.2 (38.9)**
% with keywords	42.2 (47.3)	72.0 (15.3)	58.5 (40.7)**

Note: *$p < .05$; **$p < .01$.

Epistemological Inquiry and Changes over Time

We examined the frequency and quality of the questions posed over the three periods (Table 2). We classified the questions as high-level (Levels 4 and 5) or low-level (Levels 1, 2 and 3). The mean number of high-level questions posed per student was 0.6 in Phase 1, 3.8 in Phase 2 and 1.4 in Phase 3. Combining question quality and frequency generated an inquiry score; for example, a student who posed one Level 1 question, one Level 2 question, and two Level 3 questions would have an inquiry score of 2.25 (the total question value divided by the number of questions asked).

Table 2
Depth of Inquiry on Knowledge Forum Over Time

	Phase 1	Phase 2	Phase 3
# of Questions	1.5 (2.5)	9.6 (6.6)	3.0 (2.8)**
# of High-Level Questions	0.6 (0.9)	3.8 (2.9)	1.4 (1.7)**
Inquiry Scores	1.7 (2.0)	2.6 (0.8)	2.4 (1.8)*

Note: *$p < .05$; **$p < .01$.

A MANOVA showed significant differences for all inquiry measures across the three phases. Post-hoc tests indicated significant differences on all three measures between Phases 1 and 2 suggesting increased depth of inquiry. There were no differences in inquiry scores in Phases 2 and 3, which suggests that the students maintained their levels of inquiry over the summer. Taken together, the qualitative ratings of the questions (inquiry) showed a similar pattern with the quantitative indices of forum participation. There was a general growth trend, and the students maintained an interest in knowledge-building inquiry, working on Knowledge Forum by themselves even after their examinations.

Prediction of Knowledge Building Measures on Scientific Understanding

We conducted analyses to examine how students' knowledge-building engagement and inquiry might predict their scientific understanding. We first combined the six participation (ATK) scores using factor analysis. Two factor scores were generated; the first termed "Productivity" (notes written, notes read, revisions and scaffolds) explained 40% of the variance, and the second, termed "Collaboration" (notes linked, keywords), explained 22% of variance. "Productivity" included the indices that focused more on student participation, such as the number of notes written, revisions made, scaffold uses, and notes read. "Collaboration" focused on students interacting and collaborating with each other, such as linking to and referencing the notes of other classmates, or using keywords to make their notes more accessible in a search. These two indices have been identified in other studies on knowledge building (e.g., Lee et al., 2006).

We found significant correlations among various measures, specifically that scientific understanding was correlated with prior science achievement based on the Grade 9 exam results (r = .67, p<.001) and ATK collaboration (r =.61, p<.001). A hierarchical multiple regression analysis on scientific understanding was conducted with prior science achievement (Grade 9 scores) entered first, followed by ATK collaboration scores, and then the inquiry scores (Table 3). The results showed that prior science achievement contributed significantly to scientific understanding (R^2= .45). When the ATK collaboration scores were entered, R^2 changed to .56 adding 11% of variance; when depth of inquiry scores was entered, R^2 changed to .63, adding an additional 6% of the variance. All changes were statistically significant. These findings suggest that, over and above prior science achievement, students' collaboration indices in Knowledge Forum and the quality of the questions they asked contributed significantly to scientific understanding. What is of particular interest is that it is not *productivity* but *collaboration* that contributes to scientific understanding.

Table 3
Multiple Regression of Prior Science Achievement, Collaboration (Analytic Toolkit), Depth of Inquiry on Scientific Understanding

	R	R^2	R^2 Change
Prior Science Achievement	.67	.45	.45***
ATK Collaboration	.75	.56	.11**
Depth of Inquiry	.79	.63	.065*

Note: *$p < .05$; **$p < .01$; ***$p < .001$.

Knowledge-Building Discourse and Processes

We provide an example based on student writing on Knowledge Forum to illustrate how knowledge building was manifested and how it might scaffold students' scientific understanding. This selection was based on the teacher's recollection of how he came to realize that it is possible for students to pursue problems collectively and engage in creating knowledge for the community. The example illustrates how students demonstrate epistemic agency, charting their own course of inquiry and viewing ideas as improvable and supported by constructive use of scientific information to refine their explanations.

The inquiry from which the excerpt was taken started with a question raised by Jacqueline, who wrote: "My mum has gone to the supermarket for[three] times… but still can't buy bleach [to kill the SARS virus]. Too many people want it nowadays… Can we use alcohol to kill the bacteria too?" She wanted to know whether alcohol has the same function as bleach in killing the SARS virus although she mistakenly used the term "bacteria" instead of "virus". This wonderment question sparked an inquiry into the relative properties of the two disinfectants and their effects on the SARS virus. The discourse continued with another student's observation about the strength of commercially sold alcohol.

She wrote: "The normal alcohol [sold on the market] contains 75% alcohol" (Cindy). This provided more information about household alcohol and led to further puzzlement: "Why is it 75%?" (Jacqueline).

A common theme is that students were engaged in posing problems and puzzlement. These two short exchanges helped the students to think more deeply about the effects of alcohol on bacteria and viruses and to question why only 75% alcohol, rather than pure alcohol, is used for sterilization. The puzzlement leading to a formulated problem brought about a search for new information; Jacqueline continued the explanatory discourse and wrote a paraphrased version of an explanation she found in a science book. She wrote:

> The concentration of pure alcohol is so high that it will, in no time… completely solidify the protein on the surface of the bacteria, so forming a layer of hard membrane. This layer prevents the alcohol from further diffusing into the bacteria… But the situation is different for alcohol mixed with water. The diluted alcohol will not quickly solidify the protein on the surface of the bacteria; it can diffuse into the bacteria and solidify all the protein content inside… That is why... diluted alcohol works better than pure alcohol in sterilization.

This explanation provided a plausible mechanism of how alcohol can kill bacteria at a microscopic level (by solidifying the protein of the bacteria) and why water is needed for proper disinfectant activity. However, the discourse did not stop there with this initial explanation. Other members of the community continued with the search for explanation that deepened the inquiry – Macy posed her puzzlement as follows:

> Mmm.... but then do you mean that the "protective protein layer" will block the bacteria from coming out? And [will] they be kept in our skin? Or even enter the body? Wow.... that's terrifying…But is the layer formed ON the bacteria... or somewhere else?

Macy was trying to clarify two related points pertaining to the explanation - where the "protective protein layer" is formed and what the consequences are of such a layer being formed. It can be seen that the students were posing queries and that they felt comfortable to write about their 'uneasiness' and what might not make sense to them. It is through such queries that the collective discourse can be deepened for idea improvement and *theory revision.* It is interesting to note that Macy did not refer to the book directly when she posed her questions, but rather to Jacqueline's note: "do ***you*** mean that…". It seems that, to Macy the authoritative information had become Jacqueline's own ideas. The second point put the initial explanation to a more rigorous test by further considering the possible consequences that arose, thus opening the door for theory revision and "improvable" explanation.

The explanatory discourse went to a deeper level with another explanation given by Youde, which she had found in another science book. She paraphrased and wrote:

> Alcohol = ethanol (C_2H_5OH)… it has strong diffusing power. It can drill into the bacteria and denature its protein; and so kill the bacteria. In the past, people thought […followed by a few lines paraphrasing Jacqueline's initial explanation]. But in fact, just pure alcohol or pure water cannot denature the bacteria's protein. It is only with water and alcohol together that has the power… Protein is composed of long spiral chains... On the inside of the chains, there are many "base clusters" that dislike water. [On] the outside are many "base clusters" that like water. There exist attractive forces between these two different kinds of base clusters… These attractive forces have to be broken down first… Since the non-polar part of alcohol [molecules] is $–C_2H_5$, it can only destroy the attractive forces among the base clusters that dislike water…and water molecules can only destroy the attractive forces among the base clusters that like water…so water and alcohol need to work together in appropriate concentration..to sterilize.

As the students engaged in the pursuit of deepening inquiry, this new explanation not only refuted the old one but also brought out more chemical knowledge about alcohol *(Alcohol = ethanol (C_2H_5OH))* and

the structure of bacteria protein *(Protein is composed of...)* by giving more details at the microscopic level. The students' understanding of the original problem was revised and deepened continually, illustrating the characteristics of knowledge-building discourse and reflecting theory revision in science. Specifically, the problem on finding substitutes for bleach to kill bacteria (actually a virus) led successfully to a progressive scientific inquiry. It began with the wonderment question of whether alcohol can kill bacteria as bleach does. This puzzlement was formulated into a scientific problem: the role played by the concentration of alcohol in killing bacteria. These questions then led to an initial explanation aided by scientific information about how alcohol can kill bacteria (by solidifying the bacteria's protein); the original macroscopic question was examined at the microscopic level. The discourse continued to progress as the students viewed ideas as objects of inquiry for refinement, and the initial explanation was subject to query. New questions were raised and these puzzlements led to reformulation with a new explanation that elaborated on the microscopic structure of alcohol (with symbolic formula provided) and the protein of bacteria. Primarily the students worked collectively grappling with emergent problems and extending their knowledge.

Several discourse moves are manifested in this example, including the posing of wonderment questions, explanatory discourse, constructive use of information, and theory revision. Quite different from the knowledge transmission approach common in traditional Hong Kong classrooms, the students here took the emergent approach of intertwined questions and explanations in pursuit for idea improvement. Their discourse shows that the information was not viewed as something given from outside the community. On the contrary, they treated it as their public "property" or as an "object" that could be value-added or modified by any one of them (e.g., *"Do you [not the text] mean…"*). This suggests that the knowledge-building approach not only shaped the way in which the students went about their scientific inquiry, but also their epistemology of science. Most importantly, they were inquiring both to learn science content and also as scientists themselves formulating problems, posting initial ideas, revising their theories, and working at the cutting edge of the knowledge of the community.

Discussion

This study has investigated the role of collaborative knowledge building mediated by a computer-supported learning environment in fostering scientific understanding. Our results show that the knowledge-building students outperformed the comparison students on scientific understanding; student collaboration and inquiry scores in Knowledge Forum predicted scientific understanding over and above prior science achievement. The results also show several productive knowledge-building discourse moves, including wonderment questions, explanatory inquiry, constructive use of information, and theory revision that might help scaffold scientific understanding. Issues relating to the effects and roles of knowledge building in fostering scientific inquiry are discussed.

Whereas earlier studies in knowledge building have included evaluation designs with comparison groups (Scardamalia, Bereiter & Lamon, 1994), more recent studies have focused on elucidating the rich dynamics of knowledge building (see review, Chan, 2012). Since the knowledge-building approach emphasizes collective agency and emergent processes, there may be concerns that students, while engaged actively in knowledge-building inquiry processes, may not be learning adequate science content. One contribution of this study is that it provides additional evidence about the positive roles of collective knowledge building on scientific understanding and achievements, including a comparison group with delayed tests, thus enriching the knowledge-building literature. Specifically, our results show that the students who had experienced knowledge building outperformed the comparison students in school tests of scientific understanding and sustained their advantage in public examinations one year later. Furthermore, within-group comparisons using hierarchical regression analysis show that collaboration in Knowledge Forum and depth of inquiry were significant predictors of scientific understanding over and above the effects of prior science achievement. We have provided evidence that the students' active involvement in knowledge building did influence their science learning scores beyond prior science achievements.

It is interesting to note that the knowledge-building students obtained higher grades in *public examinations* than did the comparison students.

These findings suggest that student gains were not achieved at the expense of school learning. Rather, by deepening their understanding through explanation-based knowledge-building discourse, the Knowledge Forum students might have integrated their knowledge about chemistry better than did their counterparts in the comparison class. They made both individual and collective advances as they worked collectively and there were gains in both science concepts and authentic scientific practice. Such findings are important for developing knowledge-building innovations in different school contexts, and in particular those that emphasize standard curricula and examinations (Chan, 2011).

Although the quantitative findings provide general support for the positive effects of knowledge building on learning science, it is through examining the knowledge-building dynamics that a deeper understanding can be gained of how knowledge building scaffolds scientific understanding. Our findings show that the students' participation and inquiry improved over time, with them becoming increasingly engaged in their participation and collaboration in the forum. The participation indices were much higher than those reported in the literature for online discussions (Lipponen et al., 2003). In addition, the students engaged in deeper inquiry over time, moving from descriptive to explanatory questions. The level of questions asked has been shown to be important in scientific inquiry in cognitive research (Chan et al., 1997; Okada & Simon, 1997). Congruent with epistemological inquiry, idea improvement may be illustrated by moving scientific inquiry from the descriptive level to the question-driven explanatory level (Hakkarainen, 2004). The progress of the students in the Knowledge Forum discussions can be gauged in part by the level of their question-driven inquiry as represented by the questions they raised. Elaborating and building on peers' questions is important for science understanding in a developing knowledge-building community. The solving of real-life problems through collaborative problem-centered inquiry activates prior knowledge to enhance their problem-solving abilities in the context of chemistry.

The importance of question asking and explanatory inquiry has been well documented (Hakkarainen, 2004; Lee et al., 2006; Zhang et al., 2009), but we further show that collaboration in Knowledge Forum, as

measured by the ATK collaboration index, contributes to science understanding over and above the effects of prior science achievement. Importantly, it was not the number of notes the students wrote or even how many thinking prompts (scaffolds) they used that made the difference. Rather, it was the extent to which they elaborated and built on their classmates' postings, questions and ideas that most enhanced their scientific understanding. Such empirical findings support theories of collaborative knowledge building -- they are consistent with the socio-cognitive dynamics emphasizing community connectedness (Zhang et al., 2009) and social dynamics (van Aalst, 2009) in knowledge-building communities. For classroom implications, it is important to encourage students to work collectively, building on, linking to, and referencing others' ideas rather than just working on their own ideas.

Qualitative analyses suggest that knowledge-building discourse may support conceptual, social and epistemic goals of science learning. In chemistry, the *conceptual* schema includes three levels of representations including macroscopic, microscopic and symbolic ones for explaining observed chemical phenomena (Treagust et al., 2003). Excerpts from the knowledge-building students' discourse suggest that collective problem formulation and co-construction help students to move from one level of representation to another while developing a deeper understanding of chemical explanations. We have also demonstrated that, when engaged in knowledge-building discourse, students had opportunities to articulate their views and to examine their own understanding with regard to others' models, thus helping them to develop metacognition and agency.

The knowledge-building approach to scientific inquiry focuses on students working *socially* and collectively as a community of inquirers, in which their goal is not only to improve their individual understanding of science, but also to view the ideas of the community as conceptual artifacts for improvement. In some ways, knowledge building may be closer to authentic scientific inquiry when this is understood to mean idea improvement and collective knowledge advances. The high-school students in this study were engaged in inquiry processes similar to those in *scientific and scholarly communities* – they were engaged in posing

problems, forming conjectures and hypotheses, searching for information, and co-constructing explanations as they deepened their inquiry and refined their theories. The discourse analyses show how the students made progress in both scientific *concepts* and scientific *processes* of inquiry through working collaboratively, and emphasizing collective agency and progressive inquiry.

Excerpts from the discourse show how the students developed new ways of viewing the nature of knowledge. Information from science books is not information "out there", but a resource for them to build and revise their theories. They might be developing an *epistemic* understanding about the nature of knowledge and the notion that ideas are improvable. During this process, the students might develop into active agents and knowledge builders. It is interesting to note that the students in this study continued their inquiry during the summer without the presence of the teacher. They may even have developed a different epistemological understanding, whereby they no longer saw the teacher as the sole source and authority of knowledge (Hofer & Pintrich, 2002), but could possibly see themselves and their peers as resources for learning and knowledge advancement.

Knowledge-building inquiry, as shown in this study, may help students to achieve multiple goals, allowing them simultaneously to develop an understanding of science concepts, to reconsider their views of science as evolving *("In the past, people thought")*, and to engage in the scientific practice by posing problems, constructing explanations and improving collective understanding. Knowledge building, through its primary focus on community knowledge growth, the scaffoldings provided by its principles and technology, and its focus on research- and explanatory-based inquiries into authentic problems, may help to address the persistent problems in science learning, namely difficulties in studying science, usually with an excessive focus on the symbolic level, the impoverishment of student metacognition, and students' views of science as authoritative rather than evolving knowledge. As noted above, we conjecture that the students not only developed scientific understanding and inquiry skills, but also changed their views about learning and knowledge. However, these possible relationships among epistemological beliefs, knowledge building, and conceptual change need to be investigated further.

There are various limitations to this study that point to areas of further research. First, as in many technology-related studies that include multiple interacting factors, the comparison class was not a strong control, and thus the results should be interpreted with caution. The class curriculum was similar and the comparison students were asked to complete other work in the time the other students spent on Knowledge Forum after school. We included the comparison class to provide some background to our findings; it is noteworthy that intra-class regression analyses also revealed the benefits of Knowledge Forum participation and inquiry. Second, scientific understanding was examined primarily using school examination results. Although the paper included questions probing for qualitative understanding, and it has the advantage of assessing how collaborative inquiry-based learning such as the knowledge building model can be aligned with school science, more elaborate measures would be useful. Finally, further investigation should be undertaken to examine the roles of the teacher and classroom dynamics in fostering the growth of the knowledge-building community.

Conclusions

This study has shown how the design of a collaborative knowledge-building environment supports collaboration, inquiry and explanatory discourse in ways that facilitate both scientific processes and science achievement. We have provided additional empirical evidence to the knowledge-building literature, suggesting that collective knowledge building can have beneficial effects on school science learning. Such findings are important in light of increased emphasis on both curriculum standards and reformed approaches. As well, knowledge-building discourse, mediated by a computer-supported environment, addresses conceptual, epistemic, and social goals of science learning that allows students to develop a deeper understanding of science concepts, to reconsider their views of science, and to work together in a community to advance their knowledge frontiers. This study suggests that knowledge building can bridge “real science” and “school science” and can foster both “science learning” and “learning *about science”*,

because of its emphasis on both the advancement of subject-matter understanding, together with epistemic beliefs, and scientific practice of theory building through a knowledge-building community. It also provides an example of how knowledge building can foster science learning in a cultural and educational context that places great emphasis on examinations. How knowledge building can be integrated in classroom practice in science education is the major question that requires further investigation.

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Addressing Adolescent Depression in Schools: Evaluation of an In-service Training for School Staff in the United States

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Addressing Adolescent Depression in Schools: Evaluation of an In-service Training for School Staff in the United States

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Abstract

This study evaluated an adolescent depression in-service training for school staff in the United States. A total of 252 school staff (e.g., teachers, principals, counselors) completed assessments prior to and following the in-service and a subsample of these staff participated in focus groups following the in-service and three months later. Questionnaire and focus group data suggested that the in-service increased school staff's perceived awareness and knowledge of adolescent depression and knowledge of how to connect with depressed students, guide their learning process, and connect with students' parents. School staff viewed the in-service as a valuable tool for their school and provided suggestions for the refinement of the in-service. Finally, perceived changes in teacher behavior were reported three months later. Implications and future directions were presented.

Keywords: adolescent depression, teachers, school-based program, depression awareness, training.

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Tratando la Depresión de Adolescentes en las Escuelas: Evaluación de un Programa de Formación Continuada de Personal Escolar en Estados Unidos

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Resumen

Este estudio evaluó un programa de formación continuada del personal escolar en Estados Unidos sobre la depresión de adolescentes. Un total de 252 representantes del personal escolar (profesorado, directivos, asesores) completó las evaluaciones antes y después de la formación y una submuestra de este personal participó en grupos de discusión después de la formación y al cabo de tres meses. Los datos de los cuestionarios y los grupos de discusión sugirieron que la formación continuada incrementó la conciencia y el conocimiento de la depresión adolescente y el conocimiento sobre como conectar con estudiantes deprimidos, guiarles en su proceso de aprendizaje y conectar con sus padres. El personal escolar vio la formación como una válida herramienta para su escuela y presentaron sugerencias para su mejora. Finalmente, tres meses más tarde se percibieron cambios en el comportamiento del profesorado. Se presentan las implicaciones y las futuras líneas de trabajo.

Palabras clave: depresión en adolescentes, profesorado, programa basado en la escuela, concienciación sobre la depresión, formación.

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Depression is common in adolescence and is linked to future depressive episodes, anxiety, early alcohol and substance initiation, and suicide attempts and completion (Fergusson & Woodward, 2002). Adolescent depression is frequently accompanied by decreased academic achievement, self-esteem, and competence, and increased interpersonal difficulties (Calear & Christensen, 2010; Fergusson & Woodward, 2002). Early detection and intervention are critical to abate adolescent depression and associated risks (Moor et al., 2007).

Schools are an ideal setting for preventing depression because they can reach a large proportion of adolescents whose depression might not be identified (Chamberlin, 2009). In addition, school-based services for depression may be more acceptable to adolescents than traditional mental health services, given the convenience of these services and the reduced stigma and cost of services in school settings (Calear & Christensen, 2010; Chamberlin, 2009). Despite the promising role of schools in addressing adolescent depression, rates of adolescent depression continue to be unabated (Herman, et al, 2004).

Schools in the United States are increasingly looking toward evidence-based interventions to address adolescent depression. While interventions have been developed for adolescents and evaluated in randomized trials (see Calear & Christensen, 2010), adopting these interventions in schools outside of the research context has proven challenging (Olin, Saka, Crowe, & Hoagwood, 2009). Evidence-based interventions may require significant operational funds and training, and availability of space and staff time, all of which may not be available in schools (Olin et al., 2009). To overcome these obstacles, recent studies have increasingly incorporated school staff as program leaders in school-based interventions. However, an Schools in the United States are increasingly looking toward evidence-based interventions to address adolescent depression. While interventions have been developed for adolescents and evaluated in randomized trials (see Calear & Christensen, 2010), adopting these interventions in schools outside of the research context has proven challenging (Olin, Saka, Crowe, & Hoagwood, 2009). Evidence-based interventions may require significant operational funds and training, and availability of space and staff time,

all of which may not be available in schools (Olin et al., 2009). To overcome these obstacles, recent studies have increasingly incorporated school staff as program leaders in school-based interventions. However, an examination of these interventions reveals that teachers are less effective at implementing them than specialized school mental health professionals or researchers (Calear & Christensen, 2010).

Less favorable outcomes of teacher-led depression interventions may be a function of limited training in depression intervention (Maag & Swearer, 2005) and limited time available for implementation of intensive interventions (Evers, Prochaska, Van Marter, Johnson, & Prochaska, 2007). Thus, efforts should focus less on training teachers to intervene clinically with their depressed students, and more on training teachers to detect adolescent depression and offer supportive strategies to students within the classroom setting (Maag & Swearer, 2005). Teachers are well-positioned to detect depression because of their regular student interactions (Puura et al., 1998), affording them the opportunity to notice student changes in mood and behavior, peer relationships, classroom participation, and school performance and attendance (Auger, 2004; Maag & Swearer, 2005).

Teachers often struggle to identify depression in students (Auger, 2004; Burns et al., 1995). In a study by Auger, there was only a .22 correlation between teacher-identified depressed adolescents and self-identified depressed adolescents. Burns and colleagues found teachers recognized signs of depression in only 0.6%-16% of depressed adolescents. In a more recent study by Moor and colleagues (2007), teachers were only able to identify as depressed half of their students who had been clinically diagnosed with depression by a mental health professional. For school counselors to receive timely referrals of depressed adolescents, improving teachers' recognition of adolescent depression is paramount (Maag & Swearer, 2005).

In addition to increased detection, teachers could learn classroom strategies that are consistent with their teaching practices and that aim to enhance their interactions with depressed students (Maag & Swearer, 2005). For example, teachers could be taught about the value of establishing a personal connection with depressed adolescents (e.g., showing warmth, providing individualized attention), of enhancing

adolescents' learning of classroom curriculum (e.g., pacing assignments, using motivational techniques, praising for effort, making instructional modifications), and of connecting these students to supportive peers and other school professionals (Herman et al., 2004). Teachers would also be well-positioned to initiate parent involvement for students for whom they have concerns about depression (Auger, 2004). Training teachers to detect signs of adolescent depression and to incorporate classroom-based support strategies is more likely to sustain in schools than using specialized interventions.

Low-cost, less intense depression awareness programs for teachers need to be evaluated. School-based depression awareness programs have been widely used in the United States, but many have limited effectiveness data. Other programs, such as "Red Flags" in Ohio (Newman, Smith, Newman, & Brown, 2007), are difficult to replicate because they lack uniformity in implementation. Without uniformity, schools may adopt partial elements of programs to save costs. However, sub-optimal program levels may not address the needs of at-risk adolescents.

One promising program, "It's Time! Adults Addressing Youth and Teen Depression" (hereafter called "It's Time!"), is a school-based in-service for school staff. "It's Time!" was developed at InHealth Wisconsin, a non-profit outreach organization. Program developers facilitate the program and train other facilitators via modeling and observation, review of program content and manuals, discussion of strategies, and ongoing face-to-face, phone, and email coaching and support. "It's Time!" is implemented uniformly across schools.

Theoretically, "It's Time!" is based on the Transtheoretical Model (Prochaska, Johnson, & Lee, 2009) and Theory of Social Support (House, 1981) to create change. The Transtheoretical Model posits that change occurs when one recognizes a need for change, believes there is realistic hope that one can make the change, and has a plausible plan for change and the maintenance of it (Prochaska et al., 2009). "It's Time!" trains school staff to recognize that adolescent depression is an important issue and that prevention is possible and can be accomplished with the right tools and supports in place. In addition, "It's Time!" is based on Social Support Theory which contends that identification of

depression is more likely to occur within a supportive environment (i.e., schools) in which emotional, instrumental, and informational resources for change can be provided (House, 1981). These resources include establishing a personal connection with depressed adolescents, supporting depressed adolescents academically, and collaborating with parents and school professionals to coordinate care.

"It's Time!" aims to increase awareness, improve intervention and support skills, and promote connections to resources in school settings (see Table 1).

Table 1
Description of "It's Time!" in-service

Topics/Activities	Format		Time (minutes)
	Video/Slides	Experiential	
		X	10
Educational Topics	X		75
Depression causes and signs			
Brain chemistry of depression			
Depression in the school setting			
What helps teens who are depressed			
Importance of awareness and treatment			
Importance of personal connections			
Things school staff can do to help			
Behavioral responses and crisis management			

Table 1 (continued)
Description of "It's Time!" in-service

Topics/Activities	Format		Time (minutes)
	Video/Slides	Experiential	
Hope and lessons learned			
Completion of "What do you believe" exercise		X	10
Snowball activity		X	15
Reframing activity		X	20

The in-service is a low-intensity (2-hour) and low-cost program ($1000) that has been conducted in over 75 public and private schools in Wisconsin, as well as Oregon, Vermont, North Carolina, Illinois, Indiana, Minnesota, and Maine. An unpublished evaluation of the program conducted in five schools shows that a percentage of in-service school staff increased their (a) curiosity about students' attitudes, behaviors, and academic problems (82%), (b) strategies to create positive connections with depressed students (82%), (c) conversations with other school staff about how to better understand and connect with these students (66%), and (d) contacts with parents about how to best understand and connect with their child (44%) (InHealth Wisconsin, 2006).

This study is the first external evaluation conducted of the "It's Time!" program. The evaluation was exploratory because program developers were interested in expanding the scope of the intervention based on consumer feedback. Thus, this study examined whether staff participating in the "It's Time!" in-service would (a) perceive increased knowledge of depression from pre to post-test, (b) perceive increased knowledge of strategies to use with their students, and (c) value the use of the program in schools. Finally, staff perceptions of increased use of supportive strategies with students with depression over a three-month time period were explored. Possibilities for program expansion were also explored during focus groups.

Method

Participants

Five high schools and one middle school in southeastern and south central Wisconsin were recruited by the program developers to participate in "It's Time!". Schools received the in-service free of cost for agreeing to participate in the evaluation. The in-service was offered at the beginning of the academic year as part of mandated professional development training for school staff. Participation in the study was voluntary and all procedures were conducted in accordance with the institutional review board of the evaluators' university. The in-service and evaluation were conducted at each participating school.

Four of the schools were located in the suburbs of two adjoining cities and the remaining two were urban within one of the cities. Based on school records, more than half of students in the urban schools in this study were African American and more than half of students were eligible for free or reduced lunch. Over three quarters of suburban students were non-Hispanic White and no more than one-fifth of students was eligible for free or reduced lunch. The suburban schools were significantly larger and accounted for 94% of school staff. One of the urban schools was a charter school for children who had a history of being bullied.

Of 252 school staff participating in this study, 85% were teachers, 5% were school counselors, 3% were special education teachers, and the remaining 6% were other personnel and administrators. More than half (62%) of the school staff were female and 95% were non-Hispanic White. All invited school staff participated in the in-service and evaluation.

Design and Procedure

A multi-time point design was utilized to evaluate school staff's perceived knowledge of depression and use of supportive strategies with their depressed students. Pre- and post-questionnaires were administered and a first round of focus groups took place on the same

day of the in-service (post) and again three months later (follow-up).

The evaluation team consisted of a faculty member and five graduate students from a local university. Before the in-service began, the evaluation team handed out packets with the instruments to the entire school staff at the end of their mandated school orientation. After reading a consent form and agreeing to participate in the evaluation, further instructions for participation in the study were given. Individuals who participated in the focus groups were nominated by the principal at each participating school and had different levels of experience with a student with depression.

In-service Description

The in-service was conducted by InHealth staff and consisted of a 75-minute video presentation, supplemental materials, and two interactive activities. These components were scripted in a manual and presented sequentially over two hours.

Video presentation. The video presentation consisted of 15 real stories of local students, parents, and teachers/other adults and informational slides. Student stories told of their experiences with depression, typical and atypical symptoms, and ways that teachers offered effective support. Parents discussed their experience of dealing with their children's depression and teachers provided examples of ways in which they identified and supported their students with depression. The informational slides were alternated with the video stories to maintain participants' interest and to reinforce the content of the stories.

Supplemental materials. Immediately following the video presentation, school staff were provided two handouts intended to reinforce knowledge of depression and to increase staff's sense of competence in addressing adolescent depression. The "Reframing" handout included examples of situations in which adults can effectively interact with students by altering their perspectives and behaviors. The "Talking with Parents" handout provided strategies to reach out to parents of students experiencing depression.

Interactive activities. Next, groups of 10-20 persons each were formed for two interactive activities which were designed to engage

actively school staff through experiential learning (Bonwell & Eison, 1991). At the beginning of the in-service, school staff engaged in the Snowball activity by discussing myths, facts, and how their personal beliefs about adolescent depression were formed from prior life experiences. Staff wrote these beliefs anonymously on a piece of paper, crumpled the paper into a ball, and tossed it into a box. At the end of the in-service, facilitators created an imaginary physical space in the room designated to represent different beliefs of adolescent depression. School staff retrieved one of the 'snowballs' from the box and physically moved to the sign ("strongly agree," "agree," "disagree," and "strongly disagree") that was consistent with the beliefs on their snowball. They then discussed why the person who completed that snowball might have held that belief and how that person's beliefs might have changed after the in-service.

In the Script Rewrite activity, a handout with five scripted scenarios involving interactions with depressed adolescents was distributed to school staff to help them develop a plausible plan for supporting students. School staff role-played the scenarios for 30 minutes. Next, they were asked to read the "Reframing" handout described above and revise and role-play the new interactions.

Measures

All measures were developed by the authors with expert input and pilot tested at a school similar to those in the study receiving the in-service but not participating in this study.

Effectiveness pre- and post-in-service questionnaires. School staff completed a 10-minute questionnaire prior to the video presentation, which consisted of six open-ended items that assessed need for the in-service and baseline knowledge of depression and strategies with depressed adolescents. An open-ended questionnaire was developed to assess participants' own pre-existing (pre) and acquired (post) knowledge of depression and strategies. This format contrasts with a forced-choice or Likert questionnaire that might alert participants to desired responses (Maag et al., 1988). The questionnaire was rooted in DSM-IV-TR depression symptomology (American Psychiatric Association, 2000) and in program evaluation literature (Owen &

Rogers, 1999). The questionnaire included an open-ended item measuring staff's baseline awareness and knowledge of adolescent depression (i.e., "What indicators get you to suspect that a student might be depressed?"). Three additional items evaluated existing use of strategies with depressed students: "What specific strategies have worked for you to (a) connect with adolescents who might be depressed, (b) guide the learning process of adolescents who might be depressed?, and (c) talk to parents of adolescents who might be depressed?"

Assessing perceived changes in knowledge about depression at the end of the in-service, four items paralleling the baseline knowledge and the existing use of strategies from the pre-in-service questionnaire items were administered: "Now that you have seen the program, what indicators of depression were new or clarified for you that you will look for in adolescents who might be depressed?," "What new strategies will you plan to use to (a) connect with adolescents who might be depressed?, (b) guide learning in the classroom for adolescents who might be depressed?, and (c) talk to parents of adolescents who might be depressed?"

Focus groups. Each of the six schools agreed to participate in focus groups following the completion of the in-service and post-questionnaires. Facilitated by members of the evaluation team, the focus groups were semi-structured (see Table 2) and consisted of 4 to 7 individuals each (41 total), with a range of sex, age, and teaching/work experience.

Focus group questions were designed to evaluate school staff's acceptability of the in-service, particularly the in-service's strengths and limitations, and recommendations for improvement and further development. The focus groups were audio-recorded and lasted 60 to 90 minutes. Three months after the initial focus groups, two schools participated in follow-up focus groups. These focus groups consisted of both school staff who had and had not participated in the initial focus groups to obtain a range of responses. The follow-up focus groups consisted of six questions designed to assess staff-reported perceived changes over time in their recognition of depression and strategies with depressed adolescents.

Table 2
Focus Group Questions at Post- In-service and Three-Month Follow-Up

POST-IN-SERVICE QUESTIONS
1. What did you think about the in-service overall?
2. What did you think about the content of the video?
3. What did you think about the interactive activities?
4. What, if anything, did you learn from the in-service?
5. How do you think this invice could be used in your school?
6. Were there any specific experiences that you would have liked to see discussed in the in-service?
THREE-MONTH FOLLOW-UP QUESTIONS
1. Since the last focus group, what are you doing differently with students who might be depressed?
2. What kind of strategies would you like to learn about regarding your students with depression?
3. What cultural aspects, if any, would you like to see added to the in-service?
4. What kinds of follow-up in-service programs do you need?
5. What would you think of a web-based training program for teachers and other school staff about youth depression?

Integrity of Methods

Pre-in-service and post-in-service questionnaires. Open-ended responses from the questionnaires were entered into tables and coded in teams of 2-3 trained members from the evaluation team. To establish reliability, data were also coded individually by the two authors of this study. Based on content analysis methodology outlined by Krippendorff (2004), the open-ended responses were broken down into recording/coding units by making categorical distinctions, which are codes that are distinguished to be separate based on specific description. Thus, the coders analyzed the content specifically for each question, identifying when a new coding unit arose and tallying the number of participants who mentioned the same coding units. The two coders reached consensus if the coding units were coded in separate ways.

Focus groups. After the data had been transcribed, the focus groups were coded in three separate phases based on focus group methodology outlined by Krueger and Casey (2000) and Morgan (1997). In the first phase, data were coded in order to reflect the main ideas of each paragraph. After the main ideas had been coded, these were placed into larger categories that captured emerging themes. Lastly, these categories were placed into three larger categories: Strengths of the In-service, Areas for Improvement and Suggestions for the In-service.

To ensure rigor, credibility checks were utilized. First, triangulation consisted of comparing the focus group data with the other measures from this study, as well as other outside reports of school staff's experiences with depression. This was achieved by extracting the main themes from the content codes and the focus groups to determine if there were aspects that were convergent or divergent. Second, coded information was reviewed by an auditor who was not involved in the data collection or analysis to determine applicability of codes.

Results

Questionnaires

Awareness and perceived knowledge of adolescent depression. Prior to the in-service, school staff identified common indicators of

depression among adolescents. These indicators and the percentages ofstaff endorsing these indicators include: withdrawal from others and activities (22%), change in behavior (17%), drop in grades (16%), change in mood and affect (13%), and change in eating and sleeping habits (9%), among others. A few of these indicators were new for a number of school staff after the in-service, particularly withdrawal (17%), behavior changes (14%), and changes in eating and sleeping habits (6%). Atypical signs of depression emerged for a percentage of school staff (25%) that were not reported prior to the in-service. These signs include sensitivity to noise, physical pain, masking (expressions of happiness), and anxiety.

Strategies to connect with depressed adolescents. Over half of school staff (51%) reported that establishing a positive teacher-student relationship was an important tool to connect with adolescents on the pre-in-service questionnaire. The relationship would be formed by spending more individualized time with students, regularly monitoring students' feelings and school activities, and offering encouragement, trust, consistency, respect, and active listening. School staff also reported connecting with adolescents by seeking involvement from others, with 18% of school staff involving other school staff and other students, and 8% contacting parents. On the post- in-service questionnaire, 55% of school staff endorsed the importance of the teacher-student relationship. As part of this relationship, school staff indicated that genuine interest and the use of soft questions (e.g., "How are you doing today?") were important strategies. Soft questions were contrasted with questions that convey critical comments (e.g., "Why are you always late to class?"). Twenty-four percent of school staff also endorsed educating students about depression via self-disclosure and examples. For some, writing a note to a student as an invitation to talk would prove helpful; for others, it would be handing out an index card for students to write the name of a school staff member in whom they can confide. In addition, a few school staff (11%) indicated that they would allow accommodations for students.

Strategies to guide the learning process of depressed students. Prior to and following the in-service, 26% of school staff and 40% of school staff, respectively, reported that curriculum accommodations

were important in guiding the learning process of students experiencing depression. The primary accommodations reported were providing additional assistance on assignments, breaking down assignments into smaller steps, offering alternate assignments, and extending deadlines. Other accommodations included forming small groups, allowing short breaks, and creating structured activities. Prior to the in-service, 36% of school staff endorsed forming a one-to-one relationship with the student to guide their learning process. This relationship was characterized by using self-disclosure, dedicating individual time to student, and motivating students through their interactions. After the in-service, 14% of school staff endorsed the use of this strategy. A number of school staff reported strategies not mentioned prior to the in-service. Promoting a quieter environment in the classroom (12%), using supportive and soft questions (17%) and using an index card to connect adolescents to supportive adults (8%), as described above were also important.

Strategies to talk to parents of depressed students. On the pre- in-service questionnaire, 58% of school staff reported that they communicate with parents about their concerns when they suspect a student is depressed. At the end of the in-service, 67% of school staff reported that they would talk with the parents of depressed students' about their concerns. At both time points, school staff reported that contact with parents needs to focus on asking about and describing specific behaviors and signs of depression, discussing emotional and academic changes in the student, and creating an open dialogue in which parents feel comfortable asking questions. Teachers would approach parents about these topics with calm, honesty, active listening, and empathy. After the in-service, school staff who endorsed talking to parents added that they would ask parents more questions about their children's functioning and avoid placing blame on the family. Existing strategies were also reinforced by the in-service. These include holding parent-teacher conferences (18% pre-, 6% post-), providing parents with resources to help adolescents (7% pre-, 8% post-), maintain regular contact (6% pre-, 4% post-), and involve other school professionals (2% pre-, 4% post-).

Focus Group Themes

Areas of strength of in-service. A first area of strength identified by school staff was the *format of the in-service*. School staff indicated that the student stories were real, genuine, and heartfelt, instilled hope, and the most helpful aspect of the presentation. One focus group participant indicated, "I thought it was really good, coming from their hearts. I was really impressed, it was better than the [other programs] we have." Staff reported that it was also helpful that the stories were local. Staff noted that the parent stories provided powerful and refreshing perspectives about students' depression. Staff stated that the video was applicable to a wide audience of parents, students, and teachers. The video was described as "up-to-date," "well-edited," and appropriate in length.

A second area of strength identified by school staff was the *presentation of the in-service*. Many school staff reported that the presentation was "informative," and "effective at raising awareness about depression and increasing compassion towards students." School staff expressed that the in-service facilitators were excellent, dynamic, and interesting. Importantly, school staff commented on the importance of the training at the beginning of the school year "because it raised awareness into the upcoming year."

The *content of the in-service* was a third strength identified by school staff. Many of the school staff mentioned that the statistics about depression and recovery were powerful:

> When [the facilitator] presented the statistics that, yes, people can get help and you can make a difference, it's like, okay, maybe I can do something in my little way in the classroom just to help that person and to have them connect with me. So I felt it empowered me that, yes I can make a difference.

Similarly, school staff indicated that the video challenged their stereotypes of depressed students and emphasized that depression can affect any individual. A number of school staff also mentioned that the physiological aspects of the presentation were informative and that the diagrams were helpful in explaining how depression manifests in the brain. One focus group member commented that the presentation about

the brain helped her to understand how powerful these physiological influences are and how early they can predispose adolescents for depression.

The final strength identified by school staff was the in-service's *applicability to teachers*. Participants expressed learning (a) the value of establishing a personal connection with students, (b) the importance of supporting the student rather than understanding the causes of depression, and (c) the use of simple communication strategies. School staff commented on the utility of using a 3X5 index card for students to identify an adult in school with whom they would feel comfortable talking about their depression. One member described what was helpful for her:

> It made me think about the times when I've tried to be firm and what a tremendous impact of what we say has on these kids for a long time and so it made me think really carefully about using gentle words.

Areas for improvement of the in-service. A first area of improvement identified by school staff participating in the focus group referred to *tools for addressing students' depression*. Although an overwhelming majority of staff reported increased awareness of depression among their students, many indicated not having enough knowledge of how to proceed in supporting their students. Some participants stated that they would have liked more practical information about how to (a) carry out curriculum modifications, (b) engage in communication with students and parents about depression, and (c) provide resources and improve access to community services for their students.

A second area for improvement identified by school staff pertained to *issues of diversity*. Some focus group participants reported that the video was not sufficiently representative of racial minority students orstudents of different sexual orientations, academic abilities, and lifestyles (e.g. gothic). A teacher from an urban school noted:

> …I liked that [the video] was local. I noticed however, that for some people it may seem really racially or ethnically diverse; for us it was not diverse at all. And that's Wisconsin and that's [our

> town] in particular, so segregated here. You might want to have different videos for different audiences that have more people who look like them. And as was discussed there are a lot of cultural issues that come up [with] depression, and we need to make sure that those cultural issues are addressed differently for different audiences.

A third area for improvement was the *role of the teacher in addressing students' depression*. Several teachers struggled with integrating their role as a teacher with that of counseling. One member mentioned that teachers should work within a larger team of professionals, and not be expected to provide counseling. Teachers at one school expressed concern about mandatory reporting if they asked students too many questions about their lives. The *length of the in-service* was identified by school staff as a fourth area for improvement. In particular, some staff indicated that the informational slides of the video portion were too long and wished more time had been allocated to the interactive activities.

Finally, school staff indicated that the *interactive activities* could be improved. School staff indicated that the skit rewrite activity was more helpful than the snowball activity because it provided a positive and alternative way of thinking and interacting with adolescents. They wished there was more time for this activity and that the groups were broken down even further to allow for more discussion. Many liked the snowball activity because they liked learning about other people's perspectives; however, some found the activity difficult to understand.

Recommendations for the in-service. A first recommendation made by school staff was that the *in-service be adapted to students*. Focus group participants stated that the video-stories could effectively be shown to students with some modifications. Suggested modifications included (a) simplified and shorter presentation of statistics; (b) reduced information about biology; (c) decreased focus on parents; (d) increased focus on peer support; (e) increased explanation of treatment; (f) decreased number of interactive activities; and (g) addition of a facilitator training program for teachers, peers, and counselors. They also stated that the in-service presentation be conducted in smaller groups to allow for more

meaningful discussion. The following comment was indicative of adaptations for adolescents suggested by participants:

> I think I would have [peers], maybe not a parent because they really can't empathize with a parent… They could talk about how it impacted their family but they'd have to hear it from a person of their age group.

A second recommendation for improving the in-service is that it be *adapted for parents*. Participants indicated that parents with children of all ages might benefit from watching the video if it was shown during PTA meetings or made available to parents online. Staff thought that the video for parents could be accompanied by a list of resources to get their children in services. Finally, it was suggested that a separate video be made for teachers on how to approach and collaborate with parents about their children. A focus group member discussed showing the video to parents:

> Our video policy is that when we have certain things that are questionable, that we offer a previewing. I wonder whether you said this is something we'd like to show students and those parents who are most concerned might [come].

Incorporating diversity into the in-service was a third recommendation made by school staff. A common suggestion from school staff participating in the focus group was to increase representation of different minorities in the in-service. A few from the urban schools mentioned that an in-service specific to urban African American adolescents could include the following: (a) how to talk to young African American males about depression, (b) using a community effort to address this population, and (c) workshops led by an African American speaker from the community to talk about his or her own depression. They suggested that this approach could be adapted to other groups of adolescents, such as sexual minorities.

Fourth, school staff recommended *additional training opportunities*. School staff overwhelmingly requested a follow-up in-service consisting of practical and experiential activities. This training could be achieved

by including (a) role-plays of teachers responding to students, (b) reenactments of effective classroom strategies, (c) teacher-created vignettes about students with depression for group discussion, and (d) legal guidelines for student disclosure and mandatory reporting.

A fifth recommendation made by school staff pertained to *suggested content areas*. One participant suggested that it would be helpful to talk about the different types of therapy that are available for depression. School staff from one particular school mentioned that it would be helpful to have a segment on post-partum depression, since they had many pregnant students. They also shared that it would be important to include more information about physical pain and somatic symptoms that often accompany depression and how those may affect students. The last suggestion made was to provide more information about how students feel about taking medications in school. The following is a specific suggestion made by a focus group member:

> We now have a sense of diagnosing the problem; now [we're] searching for the "What next? How do you seek this help?" Especially with people with limited income and limited education, how do you seek help, what is a reasonable thing.

A sixth recommendation pertained to the *timing of the in-service*. In order to enhance learning, many school staff suggested dividing the in-service into sections over a few days or follow-up sessions, rather than one day. Many also thought it would be helpful to conduct the program shortly after school has started so they can use the information with specific students in mind. Additionally, they stated that it would be helpful to show the video to teachers and students but within a close timeframe so the teachers could provide a context and support to students. The timing of the in-service is crucial as noted by a focus group member:

> I would want to [get a follow-up training], not right away, like maybe a month, six weeks, give you time to observe the kids out there and get frustrated enough that you want to know where to go and then answer questions for you.

A final recommendation referred to *supporting materials*. School staff indicated that it would be helpful to have a handout of the presentation at the beginning of the in-service so they could follow the presentation and keep for future reference. They also shared that it would be helpful to have a handout of mental health resources, particularly for uninsured students.

Follow-up Focus Groups

Addressing what has changed for the schools and for them personally since the initial focus groups three months prior, school staff from two of the high schools (one urban, one suburban) reported changes in their interactions with students. One teacher mentioned that she is "not more lenient, but gives depressed students different assignments." Another teacher mentioned that she shares her own experience of depression when she is talking with her students. As one teacher reported:

> One of the things the video did was… made me rethink my way, because I tend to be really strict about accepting late work and so really recognizing what the students are going through and thinking about depression and the impact on grades and how to handle that in the classroom, it kind of turned me around a little bit and I was thinking okay this is something that I need to be a little bit more conscious of, and not just being hard line about it.

One school has since implemented check-ins about their students with depression with the other teachers at staff meetings allowing for better coordination of student services. Another school has since invited speakers to talk about depression to school staff. School staff from both schools said that these conversations were rare prior to the in-service and that the in-service brought it to the forefront for all school staff. School staff reported additional areas in which they desired increased knowledge and skills. Regarding resources and strategies, staff from one school indicated that they wanted to learn more about empathy to help them interact with students. They also expressed a desire to learn more about substance abuse and self-injurious behaviors in their students since these are increasingly common among their students.

Finally, staff wanted to learn more about outside resources. Others expressed interest in learning about student pressures and stress-reduction techniques school staff can use with their students who are beginning to show signs of depression. Other staff stated interest in strategies to engage parents in regular conversations about the emotional health of their children. A focus group member mentioned:

> One of the things that I thought was still lacking was a very direct process of what to do with a student who is making comments about being suicidal. There is somebody who's coming to train us on that because it was something that I still felt like I didn't absolutely know what to do.

Discussion

The current study was an exploratory evaluation of the "It's Time! Adults Addressing Youth and Teen Depression" in-service for school staff in a middle school and high schools in two Midwestern U.S. cities. Benefits of the in-service is that (a) it targets school staff as natural change agents in the students' natural environment, (b) the information is disseminated to staff via varied instructional methods to enhance learning of knowledge and skills, (c) the content of the in-service is manualized to ensure integrity of implementation by facilitators, (c) the in-service can be implemented in a brief period of time and at a relatively low cost, and (d) the materials were developed locally, thereby increasing acceptability among school staff.

Our first area of examination was whether school staff who participated in the in-service would report increased perceived knowledge of adolescent depression after the in-service. Findings suggest the in-service increased staff's reported knowledge of common signs of depression, and introduced new signs of depression that were not mentioned by staff prior to the in-service, including student masking (i.e., expressions of happiness), sensitivity to noise in the classroom, physical pain, and anxiety. Whether perceived knowledge translates into actual use of strategies with students with depression should be the next step in the in-service's evaluation.

With respect to our second area of examination that school staff would perceive learning new strategies in dealing with adolescent depression, a comparison of the pre- and the post-questionnaires showed that the staff reported learning new strategies to connect with depressed adolescents and guide their learning process. It appears that for some staff, the strategies were not new but were reinforced by the in-service. In addition, strategies reported on the post-questionnaire that had not been previously mentioned by staff on the pre-questionnaire included using supportive, empathic questions to connect with students, providing a quieter classroom environment, and providing an index card to students to identify a teacher or school staff they trusted and could turn to about their depression. Finally, strategies to connect with parents of depressed adolescents were new for some school staff but no strategies were reported that had not been previously mentioned by other school staff.

The third area of examination was whether school staff who participated in the in-service would perceive the in-service as an acceptable and feasible tool to dealing with depression. Qualitative data from focus groups immediately following the in-service and three months later suggested that the in-service was valued by school staff because it used real, local stories of students and teachers to educate staff about adolescent depression. Many school staff considered the in-service to be the best training they had received on adolescent depression. Others suggested that the in-service could be made available to adolescents and their parents. Staff from the urban schools expressed a need for more cultural diversity in the stories and more inclusion of contextual factors affecting many urban adolescents. School staff would have liked follow-up sessions to reinforce their new strategies with adolescents and parents.

Three months later, focus group participants provided preliminary evidence of sustained perceived knowledge and the emergence of behavior change during the three-month period following the in-service.

Specifically, many teachers noted positive changes in their behavior with students to connect on a personal level and to facilitate their learning process. Individual staff also reported feeling more empathy and caring for their students, which positively influenced how they

supported their students' learning in the classroom. One school had also changed their procedures for addressing adolescent depression. As a result of the in-service, this school initiated regular staff meetings to coordinate services for students with depression.

The findings of this preliminary evaluation are consistent with other depression awareness programs, such as the Adolescent Depression Awareness Program (ADAP) (Swartz et al., 2010) and the "Red Flags" Program (Newman et al., 2007), which have been widely used in Maryland and Ohio, respectively. In all of these programs (including "It's Time!"), a school-based curriculum using multiple teaching modalities (e.g., videos, interactive activities, discussion) was used to raise awareness of adolescent depression. Like "It's Time!," these programs show promise in increasing awareness of adolescent depression and of mobilizing supportive strategies when a student is depressed. Although ADAP is designed for students, teachers, and parents, published evaluation data appears to be available for the student curriculum only, thus limiting the generalizations that can be made to the teacher program. Furthermore, "Red Flags" does not have uniform implementation of instructional materials, making it difficult to replicate in other studies.

Limitations

This study was limited to measuring *perceived* awareness and knowledge and the findings cannot confirm that these perceptions or self-reports translate into actual changes in these domains or that they lead to improved services for adolescents (Moor et al., 2007). While initial evidence from the follow-up focus groups points to the in-service's potential for increasing coordination among staff regarding students with depression and enhancing staff interactions with these students, a systematic evaluation of school staff behavior (e.g., student-reported staff interactions with students, referral rates, school-wide initiatives) and adolescent outcomes (e.g., reduction in school absences, enhanced academic skills and performance, reported somatic complaints) is warranted.

Second, the use of questionnaires and focus groups allowed for an

exploration of potential program impact and acceptability, and the multi-time design allowed for an exploration of perceived knowledge and change over time. However, the exploratory nature of this evaluation and the non-experimental design (e.g., lack of comparison group) precluded complex comparisons and statistical quantification of the in-service's effectiveness. A longitudinal, experimental design with more time points and randomization of schools to comparison and intervention conditions is needed to test the efficacy of the in-service.

A third limitation of this study is the generalizability of findings to other school settings. Since data collection took place in public schools, it may be difficult to generalize the findings to private schools. However, a major strength of our sampling is the inclusion of both urban and suburban schools from small and large metropolitan cities in the Midwest.

Implications and Recommendations

Schools can play a critical role in the identification of students with depression and in the prevention of risk and promotion of student well-being (Calear & Christensen, 2010). "It's Time!" holds promise of improving recognition of depression by targeting school staff who already have regular contact with depressed students. The in-service targets strategies that are accessible to and readily implemented by school staff, including connecting with students on a personal level, providing classroom accommodations, and reaching out to other professional staff to support students (Maag & Swearer, 2005). Promoting these types of skills increases the acceptability and sustainability of these types of programs in schools (Herman et al., 2004).

This study points to the importance of collaboration between educational psychologists and educators in detecting student depression. Because educational psychologists rely on teacher referrals of students with depression, working closely with teachers is instrumental (Maag et al., 1988). Educational psychologists could do this by (a) training school staff in the recognition of depression, (b) laying out clear guidelines for referrals, (c) visiting classrooms to assist in the identification and

monitoring of adolescents, and (d) serving as liaison between teachers and parents and between school, family, and community resources (Maag et al., 1988; Maag & Swearer, 2005). Additionally, psychologists can be actively involved in the implementation, evaluation and sustainability of programs (Pfeiffer & Reddy, 1998), such as "It's Time!"

Proponents of school-based mental health services have a unique opportunity to shape public policy (Herman et al., 2004). Drawing attention to the role of schools in preventing depression and other risks for adolescents (e.g., pregnancy) in a manner that is cost-effective and sustainable can lead to increased funding of school training programs and nation-wide wrap-around services in schools, such as school health centers (Chamberlin, 2009).

The debilitating nature of depression in adolescents calls for specific, cost-effective programs to be implemented within the schools. By training school staff to become familiar with adolescent depression, schools have the potential to promote students' mental health and their associated educational outcomes (Herman et al., 2004).

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Academic Career Development Stress and Mental Health of Higher Secondary Students - An Indian Perspective

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Academic Career Development Stress and Mental Health of Higher Secondary Students - An Indian Perspective

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Abstract

The authors explored the mental health of students with their academic career-related stressors collecting data from 400 students of different schools of Eastern part of India by using; namely General Information Schedule (GIS), the General Health Questionnaire (GHQ), and the Academic Career Development Stress Scale. The data was subjected to t tests and ANOVA. The study shed light on three main results: (i) academic career development stress along with its ten components revealed dissimilarities with respect to gender and streams of study, (ii) significant relationships were indicated between the mental health status of students and various aspects of academic stress and demographic factors, (iii) qualitative analyses highlighted the complex of association among academic stress, mental health and other variables.

Keywords: student stress, mental health, academic career development stress

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Estrés Vinculado al Desarrollo de la Carrera Académica y Salud Mental de Estudiantes de Educación Secundaria Superior - Una perspectiva Índia

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Resumen

Los autores han explorado la salud mental de los estudiantes con los estresantes relacionados a su carrera recogiendo datos de 400 estudiantes de diferentes escuelas de la parte este de India, utilizando; Información General del Horario (GIS), el Cuestionario General de Salud (GHQ), y la Escala de Desarrollo de Estrés de la Carrera Académica. Con los datos se llevó a cabo t-test y ANOVA. El estudio produjo tres resultados principales: (i) la escala de desarrollo de estrés de la carrera académica junto con sus diez componentes revelaron diferencias en relación a genero y tipo de estudios, (ii) se hallaron relaciones significativas entre el estatus de salud mental de los estudiantes y varios aspectos de estrés académico y factores demográficos, (iii) el análisis cualitativo desveló el complejo de asociación entre estrés académico, salud mental y otras variables.

Palabras clave: estrés de los estudiantes, salud mental, desarrollo del estrés de la carrera académica

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Higher Secondary course is, on the one hand, a terminal for those who enter the world of work after this stage and, on the other hand, it is preparatory to higher education. During this course, students are required to cope with the psycho-physical changes of their adolescence stage along with the heavy pressure of curriculum activities for good grounding in subject areas, learning orientation, prerequisites of examinations and highly competitive screening tests for suitable higher level courses. The situation is relatively more critical for the science stream students given their extensive and exhaustive preparation for higher level science and technology courses or science based profession. These types of stress experiences of the students for meeting excessive academic demands, adjusting to new career opportunities or developing academic careers are termed as "academic career-development stress" by many researchers (Chng et al, 1998; Misra & McKean, 2000; Sharma & Jaswal, 1999).

Academic Career Development Stress

The academic career development stress is an individualized phenomenon, unique to each student and setting (Hudd et al, 2000). It is a subjective feeling, which is hard to avoid by students. The sources of academic stress may be life events or chronic strains related to academic programmes and workloads (Hudd et al, 2000). Such stress may elicit fear, tension and other psychosomatic problems and may be associated with a variety of serious negative outcomes in the adolescents, including suicidal ideation, smoking (Naquin & Gilbert, 1996) and drinking (McCormick, 1996). In extreme situations, adolescents may seek professional help to cope with the debilitating effects. This type of stress is recognized as the harmful physical and emotional responses that occur when the requirements of the academic activities do not match the capabilities, resources and needs of the students (Pramanik & Ray, 2003). *Academic Career Development* stressors are considered as the student perceived stressors which generally emerge from demands of academic and curriculum environments and resourcefulness (ability, stress, etc.) of the students concerned (Sharma & Jaswal, 1999).

Student Stress

Thus stress may arise due to the academic demands, adjusting to new course, medium of instructions, institutional situations or when developing appropriate communications with classmates and teachers, etc (Spielberger & Vagg, 1995; Akgun et al, 2003). Academic stress is considered as a process in which external or internal demands are interpreted by the students or learners in relation to their own values and goals (Allen & Heibert, 1991; Campbell & Svenson, 1992). Such stress can generally be defined as the reaction of individuals to demands (stressors) imposed upon them that refer to situations where well-being of the individuals is detrimentally affected by their failure to cope with the demands of their environment. With changing pattern of life style, value system, employment and educational opportunities, expenses for education, trends of parental expectations etc., the complexities in academic career development and related academic stress on school students are intensifying, which are indirectly being influenced by the students and their behavior. In the face of new economic challenges and competitive academic situations, the concerns regarding such academic performances and the spectra of academic failure are among the most common sources of stress and mental health hazards for students (Hembree, 1988; Pekrun, 1992; Seipp, 1991). *Mental Health Status* is a positive sense of well being encompassing the physical, mental, social, basic economic and spiritual aspects of life (WHO, 2005). In this context, owing to age-specific sensitivity, needs for growth and exposure, career decision and future education, makes the situation to be more critical in case of adolescent students studying in Higher Secondary class (Ray & Goswami, 2000; Ragheb & McKinney, 1993).

Stressors and Students

Stressors affecting students can be categorized as academic financial time or health related, self imposed. Further researchers suggested that major sources of academic stress were tests, grade competition, teachers, classroom environment and opportunities for future career (Abouserie, 1994; Britton & Tesser, 1991). Chng et al (1998) opined

that stressors among students can be divided in to two main categories: academic performances and special activities. Pramanik & Ray (2003) observed that high academic desire and competition could be thought of as a significance academic stress. Again some researchers observed that curriculum overload and conflicting roles in individual life that produce competing and potential demands over time may be source of stress and chronic strain for many students. In line with this, researchers identified that frequent class tests and observations, expectation from school teachers, parents and others were as well significant sources of stress among some students. Thus, major sources of stress go beyond high parental expectance, too much control of parents, parental monitoring style, lack of support and communication barriers with teachers and classmates, and strict discipline at school and at home (Ray & Goswami, 2000; Mishra & McKean, 2000).

Macan et al (1990) found those students who have perceived themselves as in control of their time reported greater work and life satisfaction. Along with time management, test anxiety was generally conceptual as significant stressor as well as predictor of level of stress and educational achievement of students (Pekrun, 1991; Goswami, 2000). Many studies reported that the stress experience of students were related to their perceived economic crises, and financial management pressure to carry out the expenditure for learning materials, tuition fees, etc. (Lay & Schouwenburg, 1993). Medium of instruction sometime acted as a source of stress for some students and language deficiencies have also been found to be important source of stress of some learners.

Stress and academic performance

However, the relation between stress and academic performance is not a simple one. It has both positive and negative effects on academic achievement and performance. Generally, most of the students have the ability to do well on academic curriculum activities and examinations, but because of stress many of them fail to perform at a level commensurate with their intellectual ability (Spielberger & Vagg, 1995). When such stress is perceived negatively and becomes excessive, students experience physical and psychological impairments (Murphy &

& Archer, 1966), varying degrees of pathological symptoms and reduced level of cognitive ability in academic performance (Verma et al, 1995). Recently, the academic stress related consequences and mental health status have become contemporary pervasive problems of students and academic institutions (Ray & Goswami, 2000; Spielberger & Vagg, 1995). Consequently, psychologists, counselors, educators, psychiatrists and persons interested in secondary and higher secondary education have become increasingly concerned with dependable preventive measures to protect students from career development stressors and their mental health hazard and develop methods of intervention/ counseling for stress and mental health management. As a step in this direction, the present research proposal has been framed to study the nature of academic career development stressors variables of students of West Bengal with respect to their mental health status and some demographic attributes. Accordingly, the following objectives were drawn for empirical observations:

(a) To study the nature of academic career development stress of higher secondary students with respect to gender (male and female).
(b) To study the nature of academic career development stress of higher secondary students with respect to their stream of study (Science and Humanities).
(c) To study the nature of career development stress of Higher Secondary students with respect to their mental health status.

Methodology

Tools Used

Semi structured questionnaire

This semi structured questionnaire was developed by the researchers and includes background information schedule about the curriculum, study hour, routine of studies, needs of the students, attitude towards their perceived stress, anxiety about examination, skill of communication, level of aspiration about future, etc.

Academic career development stressors scale

This scale was also developed by the researchers and consisted of 55 items, covering 10 domains, namely: difficulty level, course variation, deprivation of pleasure and interest, anticipation of punishment and criticism, time management, academic competitiveness, lack of support, academic achievement desire, test anxiety, expectancy of others, etc. The item total correlation value of the inventory ranges between 0.91 and 0.99 and the reliability coefficient of the inventory was 0.87 (Split half).

Operational definition of the sub dimensions of the scale

(a) Difficulty level of curriculum: Difficulty level of curriculum is considered as those type of pressing forces which are originated by the perceived level of complexities in integration pattern of core and peripheral subjects, content structure and educational objectives of curriculum, prerequisites of competencies for good grounding in subjects and evaluation etc.

(b) Course Variation: Course variation is regarded as interacting pressing conditions which generate from the disparities between the regular higher secondary courses and other parallel screening test-courses, in terms of the syllabus, educational objectives, and evaluation strategies, etc.

(c) Deprivation of pleasure and interest: Deprivation of pleasure and interest is thought of as the stress originating from the student perceived level of lacking in interesting and attractive contents in syllabus, pressure of unpleasant cravings and memorization, deprivations of the normal age specific needs and enjoyment due to tedious routine work, etc.

(d) Anticipation of Punishment and Criticism: Anticipation of punishment and criticism is considered as perceived stress provoking chain of events and efforts of the informant students which create hazards to achieve appreciation protection, opportunities for security and recognition about the capabilities and worth in several social and career situations.

(e) Pressure of Time Management: Pressure of time management is regarded as the stress associated with the feeling of lack of perceived control overtime which influences to manage the aspects of the individual student's outcomes such as academic performance, problem-solving ability and health.

(f) Academic Competitiveness: Academic competitiveness is characterized as the pressure or stress generating from those perceived importance of efforts and level of activities for uniqueness of the competitive strategies in the form of drives to achieve desired level of status in competitive examination, academic success.

(g) Lack of Support: Lack of support is characterized as those stress associated with the feeling of inappropriateness of help and support (informational, instrumental and emotional) from the family members, teachers and institutions in relation to academic and career activities.

(h) Academic Achievement Desire: Stress of Academic Achievement Desire is characterized as that pressing force which arises out of the intense feeling of individual urges for high level academic excellence and achievement status.

(i) Test Anxiety: Test anxiety is considered as the feeling of tension, apprehension nervousness and worry of students in association with their test performances, nature of test questions, prerequisite of learning skills and competencies for evaluation, etc.

(j) Expectancy of Others: This may be thought of strain of students due to influence of interacting forces dictated by the conditions and levels of expectancies and desires of parents, teachers and others about their achievement and career status.

General health questionnaire (GHQ)

This 28-item based scale was originally developed by Goldberg and Heller (1979) covering four subscales for somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. In this study, both original and locally adopted version of GHQ (Basu & Dasgupta, 1996) was used. The item total correlation ranged between 0.68 and 0.88 and its split – half reliability was 0.97. The total score ranges from

0 to 28. The threshold for case identification was taken as 4/5 i.e. score 4 signifies a non-psychiatric case and 5 signifies a psychiatric case.

Sample

A group of 400 students (200 male and 200 female) from secondary schools in Kolkata city and adjacent districts (Howrah and Hooghly) of West Bengal were drawn equi-proportionally from two streams of study (200 from science stream and 200 from humanities). They were selected randomly by following some inclusion criteria (age range 17-19 years and mother tongue Bengali) and exclusion criteria (shifting of stream, history of any gap in course of studies, history of any chronic disorder, records of any indiscipline behaviour).

Procedure

Data were collected from the sample group by using the above mentioned tools and strictly following the ethical issues for response collection. Both qualitative and quantitative analysis (Percentage, Mean, SD, t-test and ANOVA as per requirement) were done.

Results

This paper focuses, firstly, on the selected domains of academic career development stress (difficulty level, course variation, deprivation of pleasure and interest, anticipation of punishment and criticism, time management, academic competitiveness, lack of support, academic achievement desire, test anxiety, expectancy of others, etc) of the higher secondary student with respect to their stream of study (science and humanities) and gender (male and female). This analysis is shown in table 1. Secondly, the study reveals the nature of career development stressors with respect to the mental health status of the higher secondary students. This second analysis is revealed in table 2.

Profile of the Stressor Variables among Higher Secondary Students

It can be observed that the Mean values of the stressor variables and ANOVA results (See Table 1) indicated that the overall academic career development stress of the four groups of students were moderately high and there was no significant difference between the science stream students and the humanities stream students in terms of the overall pressure of academic career development stressors (F = 0.44). This means that there existed an almost uniform loading of overall stress of Science and Humanities stream students.

The component-wise analysis indicated that significant differences existed between Science versus Humanities stream students in terms of the six Academic Career Development Stress Scale (ACDSS) Components. Among these six component areas the strength of influence of the three factors namely difficulty level of curriculum (M = 15.57; F = 8.67) anticipated punishment and criticism (M = 11.65; F = 10.88) and expectancy of others (M = 22.92; F = 7.01) were relatively higher among the science stream students than that of the students of the Humanities group. Again, the strength of influence of the three factors namely deprivation of pleasure and interest (M = 20.52; F = 65.98), pressure of time management (M = 18.76; F = 11.78) and high academic achievement desire (M = 12.54; F = 3.80) were relatively higher among the Humanities stream students than the students of Science group.

Gender-wise analysis indicated that significant differences existed between male and female students in terms of the overall stress (M = 151.72; F = 4.38) along with the selected sources of stressors variables. In this regard, female exhibited higher responses to 6 dimensions of stressors: course variation (M = 9.77; F = 15.77), anticipated punishment and criticism (M = 11.81; F = 17.84) and pressure of time management (M = 18.72; F = 10.71), pressure of academic competitiveness (M = 18.72; F = 12.32), academic achievement desire (M = 13.22; F= 31.18), and test anxiety (M = 13.05; F = 75.75). At the same time, male exhibited higher reaction to only 1 dimension of stressors: expectancy of others (M = 23.51; F = 19.97). The nature of such differences between the male and the female groups were found to be affected by the interaction of the stream of study of the students for

selected 5 components (course variation, F = 32.23; deprivation of pleasure and interest, F = 12.91; anticipation of punishment and criticism, F = 10.31; academic achievement desire, F = 36.69 and expectancy of others, F = 98.97).

Table 1
Mean (M), mean difference (MD) and 'F- ratio' values for academic career development stress (ACDS) scale scores of students (N = 400) under two different treatment conditions (stream of education and sex of the students)

Component Areas	Mean values and Mean Difference of ACDSS Scores of students (*n = 400*)		'F-ratio' values		
	Stream of Study (Science and Humanities)	Sex difference (Male and Female)	Stream of study	Gender	Interaction between stream and sex
Overall scale Scores	Science (M) = 146.45 Humanities(M) = 148.99 MD = 2.54	Male (M) = 143.72 Female(M) = 151.72 MD = 16	0.44	4.38*	0.24
Difficulty Level of Curriculum	Science (M) = 15.57 Humanities (M) = 14.09 MD = 1.48	Male (M) = 14.60 Female (M) = 15.06 MD = 0.46	8.67**	0.85	6.27*
Course Variation	Science (M) = 9.11 Humanities (M) = 9.21 MD = 0.1	Male (M) = 8.56 Female (M) = 9.77 MD = 1.21	0.11	15.77**	32.23**
Deprivation of pleasure and Interest	Science (M) = 15.88 Humanities (M) = 20.52 MD = 4.64	Male (M) = 18.33 Female (M) = 18.07 MD = 0.26	65.98**	0.22	12.91**
Anticipation of punishment and criticism	Science (M) = 11.65 Humanities (M) = 10.51 MD = 1.14	Male (M) = 10.35 Female (M) = 11.81 MD = 1.46	10.88**	17.84**	10.31**
Pressure of Time Management	Science (M) = 16.82 Humanities (M) = 18.76 MD = 1.94	Male (M) = 16.87 Female (M) = 18.72 MD = 1.85	11.78**	10.71**	0.07
Academic Competitiveness	Science (M) = 14.61 Humanities (M) = 14.43 MD = 0.18	Male (M) = 13.78 Female (M) = 15.26 MD = 1.48	0.18	12.32**	3.16
Lack of Support	Science (M) = 16.77 Humanities (M) = 16.38 MD = 0.39	Male (M) = 16.58 Female (M) = 16.56 MD = 0.02	0.40	0.00	0.001

Table 1 (continued)

Component Areas	Mean values and Mean Difference of ACDSS Scores of students (*n = 400*)		'F-ratio' values		
	Stream of Study (Science and Humanities)	Sex difference (Male and Female)	Stream of study	Gender	Interaction between stream and sex
Academic Achievement Desire	Science (M) = 11.80 Humanities (M) = 12.54 MD = 0.74	Male (M) = 11.12 Female (M) = 13.22 MD = 2.10	3.80*	31.18**	39.69**
Test Anxiety	Science (M) = 11.34 Humanities (M) = 11.65 MD = 0.31	Male (M) = 9.94 Female (M) = 13.05 MD = 3.11	0.73	75.75**	1.93
Expectancy of others	Science (M) = 22.92 Humanities (M) = 20.92 MD = 2	Male (M) = 23.51 Female (M) = 20.23 MD = 3.28	7.01**	19.97**	98.97**

Note: * = Significant at 0.05 level, **= Significant at 0.01 level.

Profile of Stressors with Respect to the Mental Health Status of the Students

Analysis of the responses indicated (See Table 2) that out of 400 students, only 56 students showed their GHQ scale scores above 5. In order to verify the profile of the stressor variables in terms of the mental health status of the students, the t-test on stressors profile was performed for the scores of randomly selected 50 typical and 50 students with mental health challenges.

Table 2

Results of t values on Academic Stressor Variables scores for mean values of the two groups of students (Group 1 for Normal and Group 2 for Problem cases as per General Health Questionnaire, GHQ)

Stressor Variables	Students groups as per mental health status (*n=50*)	*Mean*	*SD*	*t* values for mean difference between Group 1 and Group 2
Difficulty level of curriculum	Group 1	11.92	2.79	0.55
	Group 2	12.22	2.65	
Course variation	Group 1	8.02	1.76	-1.59
	Group 2	8.62	2.01	
Deprivation of pleasure and interest	Group 1	16.58	4.31	0.31
	Group 2	16.82	3.39	
Anticipation of punishment and criticism	Group 1	17.14	3.81	-3.42*
	Group 2	19.76	3.85	
Pressure of time management	Group 1	8.30	2.62	2.73*
	Group 2	9.66	2.36	
Academic competitiveness	Group 1	16.96	3.75	0.09
	Group 2	17.04	4.31	
Lack of support	Group 1	12.14	1.93	1.06
	Group 2	12.60	2.37	
Academic achievement desire	Group 1	16.68	4.01	0.10
	Group 2	16.76	3.98	
Test anxiety	Group 1	25.26	4.83	1.30
	Group 2	26.56	5.16	
Expectancy of others	Group 1	9.66	3.47	2.51*
	Group 2	11.34	3.22	
Overall academic career development stress	Group 1	142.66	18.89	2.49*
	Group 2	151.38	15.96	

Note:* = significant at 0.01 level

The results of the significant t values (See Table 2) highlighted that the significant differences existed between normal students and students with mental health problems in terms of the profile of overall career development stress (F = 2.49) including its three components: problem of time management (F = 2.73), anticipation of punishment (F = 3.42), and expectancy of others (F = 2.51).

Discussion

Profile of the Stressor Variables among Higher Secondary Students

The component-wise analysis indicated that significant differences existed between Science versus Humanities stream students in terms of the six Academic Career Development Stress Scale (ACDSS) Components. One of the reasons behind such type of perceived high stress for Science stream students for loading of curriculum, expectancy and anticipated punishment may be that in the test conscious culture, the Science stream students of Higher Secondary Examination were preparing themselves for parallel different competitive examinations (such as IIT-JEE, CBSE-PMT, AIEEE, JIPMER, AFMC, AIIMS etc.) along with Higher Secondary Examination. Accordingly, these students were under critical pressure of stress originating from the level of parallel loading of syllabus of different simultaneous courses. The present findings about stress of parental expectation and difficulty level of curriculum loading, as influencing stressors of the science and technology students were also observed in previous studies with Indian students (Pramanik & Ray, 2003; Ray & Goswami, 2000; Sharma & Jaswal, 1999).

The present findings about trends of relatively higher stress among female students were also supported by the findings of Awake (1998) and Mishra et al. (2003) for the cultural orientation and the socialization process for expression of stress. The possible reasons for this may be that the females rate negative events more often and more markedly than males (Allen & Hiebert, 1991). Lower reactions to stressors for males students may result from their socialization which teaches them that emotional experience is an admission of weakness and not masculine (Davidson-Kartz, 1991).

Profile of Stressors with Respect to the Mental Health Status of the Students

The results highlighted significant differences between normal students and students with mental health problems in terms of the profile of overall career development stress. This depicted that students having negative attitude and perception about environment, limited future opportunities etc., were more prone to stress. The study further highlighted that negative attitude, anxiety and stressors were the preconditions for facilitating mental health problems among the students.

Background Information about Stress and Mental Health

Qualitative responses of the students (65% and above) in terms of their background information and personal interview following test-session had indicated that the study habit (in planned routine, habit of reading for 6 hours in an average or above, consultation of reference books, standardized notes and newspaper reading, practice of regular writing and frequent evaluation test etc.), free discussion with school teachers, private tutors, classmates and others with course matter, informational and congenial instrumental support from parents and school teachers, as well as their relaxation techniques (chatting, friendly informal conversation, playing, listening music and watching T.V.) were reported as helpful for developing their management skills for curriculum and time in a more comfortable way. Students (91%) also mentioned that discussion session and learning in small groups either in school or in coaching centers helped them to enjoy the learning environment to develop better understanding of studies, communication and interpersonal relationships. This means the students' positive feeling about the support of others and the student centered pedagogy helped them to become tolerant of diverse viewpoints, to consider others' thoughts and feeling in depth (Sharma & Sharma, 2009) and all these factors had acted as their coping strategy for management of stress and mental health.

The study further highlighted that perception and attitude towards curriculum loading, pressure of time management for institution and

private tutors, perception of their skill of communication along with English skill, career ambitions, participation and status of involvement in the co-curricular activities and their academic performance status has marked specificity with respect to the status of the mental health of students.

Conclusion

The trend of moderate level of career development stress is the general characteristic feature of the science and humanities stream students of higher secondary schools of Kolkata and adjacent districts. Even projecting their uniformity in overall loading of stress, the science and humanities stream students display their uniqueness in the relative influencing impact of selected six stressor variables. In general, the stressor components- 'difficulty level of curriculum' (due to heavy loading of contents and learning prerequisites of summative form of evaluation test, as well as for simultaneous screening tests for opportunities for higher education), 'anticipated punishment and criticism' for disqualification or failure, and interacting chain of stressful events arising out of expectancy of others (parents, teachers and family members) are relatively more significant for generation of stress among the science stream students. At the same time, 'pressure of time management' for heavy loading of curriculum and too many tasks/tests at a time, 'deprivation of pleasure and interest' of students with reference to the age-specific activities, curiosities and contacts (due to prolonged time schedule of curriculum activities) and too high 'academic achievement desire' are significant stress-generating attributes for the humanities group (Ray & Goswami, 2000).

The profile of academic career development stressors indicated marked specificity in terms of the 'gender of the students' and the overall academic stress was significantly higher among female students. The profile of career development stressors has indicated marked specificity with respect to the mental health status of the students. The negative attitude and perception about the environment, anticipation of limitations for future opportunities and too much curriculum loading, expectations from others etc., are some of the facilitating factors for

stress and mental health problems of students. At the same time, positive attitude towards supportive environment and learner centered pedagogy have acted as an important precondition for facilitating positive social relationships, adjustment and well-being of the students. The study also highlighted that there exists complex relationships among academic stress, mental health and other background life variables for promotion of adjustment and performance status of the students (Ray & Goswami, 2000; Spielberger & Vagg, 1995).

The rigorous demands of the academic curriculum and institutions make it difficult at times for the students to cope with variety of stresses. Hinkelman et al (2007) have pointed out that it is necessary to understand the influence of various interactive variables within the present day educational context to ensure successful interventions. If counselors can help clients understand the connections between stress and academic challenges, counseling may be an effective means of coping (Hinkelman, 2007; Multon et al., 2001). Along this line, Manuele-Adkins (1992) has stated that counselors must view students holistically and integrate the goals of psychological and educational adjustment into their counseling programs.

High levels of psychological distress and the inability of the students to cope may lead to increased risk of long-term problems in personality characteristics, provoking academic delays, low achievement, reduce teaching-learning outcome, student suicide, self-harm, harm to others and violence in society (Ge & Conger, 1999). Educational institutions should make provisions to help students stay physically, emotionally, spiritually and socially balanced (Schultheiss 2000) by organizing various wellness programs for promoting awareness drives, healthy lifestyles, student-driven social events, ethnic minorities, peer mentoring, sports and recreation- stress busters.

Henceforth, there is urgent need for the educational administrators to develop suitable interventions at the right stage to combat the negative consequences of students stress and develop balanced mental health status for successful academic achievement, development and harmony in society.

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Dismantling Contemporary Deficit Thinking

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Review

Valencia, R. (2010). *Dismantling Contemporary Deficit Thinking: Educational Thought and Practice.* New York: Taylor & Francis.
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Valencia has been working for more than fifteen years in the deconstruction of the deficit thinking discourse. In this book he defines the notion of deficit thinking as an internal explanation for the academic failure of low socio-economic status students of color (i.e. African American, Mexican American, Puerto Rican and other minorities; hereafter referred as low-SES students). Valencia discusses some competing explanations and makes some suggestions to promote a more equitable and democratic schooling for all students.

The author explains that deficit thinking assumes that internal deficits (such as the limited intellectual abilities, the lack of motivation and the linguistics shortcomings) are the cause of the academic failure among low-SES students. It is "the process of blaming the victim" (p. XIV). This way of thinking has its roots in the racist discourses of the 1600s and the late 1800s, and it obtained academic support and great diffusion in the first decades of the 20th century. Although it has been questioned and discredited, it is experiencing resurgence among scholars, policy makers and educators in relation to the strengthening of conservative thinking.

Valencia warns that deficit thinking is a pseudoscience in which ideology is embedded with science. He points out that deficit thinking is supported by research that lacks scientific rigor: unsound assumptions, psychometrically weak instruments, data collection in defective manners, absence of control of important independent variables and omission of rival hypothesis. Deficit thinking is a chameleonic concept

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which has taken several variants which are analyzed in Valencia's book: low grade genes (Neohereditarianism), inferior culture and class (culture of poverty) and inadequate familial socialization (at-risk discourse).

In contrast with the deficit thinking discourse, many researchers have observed that systemic factors have strong linkages with the academic failure of low-SES students. In accordance with this line of work, Valencia presents data to support the influence of some schooling conditions (e.g. teacher quality and inequities in basic school resources) on the academic outcomes of low-SES students.

Deficit thinking challenges the basis of democratic education. For this reason Valencia discusses in the last part of the book some questions concerning democratic schooling. First, he reviews research on deconstructing deficit thinking in the areas of educational ethnography, teacher education and educational leadership. Second, he examines the standard-based movement school reforms, arguing that it is misdirected: "it treats the symptoms of school failure (i.e. poor academic achievement indices such as low reading test scores and high dropout rates), rather than the root causes (inferior schools)" (p. 152). Finally, Valencia traces out the components for a democratic education (e.g. equal access to optimal learning, inclusion and development of citizenship skills).

In sum, Valencia's book is an advisable text. It deals with deficit thinking, "a model founded on imputation, not documentation" (p. XIV), which is widespread in the international educational thought and practice. Furthermore, it faces the general question of democratic schooling conditions in the context of plural, multicultural and economically stratified societies.

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