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School staff perceptions of factors influencing participation in a Whole-of-School initiative in an Indigenous community

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Abstract

Objectives: The purpose of this study was to investigate teachers' perspectives on factors influencing their involvement in a Whole-of-School initiative.

Methods: A survey was administered to participating teachers/school personnel ($N = 81$) and 30 of the teachers/school personnel also participated in mostly individual interviews. The survey was informed by Lohrmann's Ecological Model of Coordinated School Health Programs focusing on individual, interpersonal, community, organisation and policy factors. Category mean values were calculated for the survey data (along with *t* tests to explore differences by participant role in the schools), and interview data were analysed via analytic induction using several trustworthiness measures.

Findings: Findings revealed that all survey categories ranked 3.5 or higher on a 5-point scale and there were significant differences by participant role. Interview data provided specific examples of each of the school health ecology factors.

Conclusion: Results provide support for the model Whole-of-School programme efforts, insights into teacher and school personnel involvement and resistance to a school health change initiative. The project may serve as a model for other schools/districts interested in Whole-of-School health programming. The transformation that took place is especially important in this Indigenous community with significant health concerns.

Keywords

Indigenous community, teacher professional development, USA, Whole-of-School initiative

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This study investigated one school district's efforts to create a school culture that supported a Whole-of-School initiative (ASCD, 2015; Institute of Medicine [IOM], 2013). The intervention and this paper were both informed by the public health literature and the call for schools to serve as intervention sites to improve young people's knowledge and actions related to healthy behaviours.

It is well documented that many children are physically inactive and become less active as they age. Increasingly, negative physical activity and diet trends have resulted in significant numbers of children being at risk for serious medical conditions such as high blood pressure, heart disease and diabetes. Youth surveillance studies from many countries have shown relationships between physical inactivity and body fatness or body mass index (BMI) (Public Health England, 2011). One meta-analysis also revealed low levels of physical activity to be associated with increases in overweight children (Rowlands et al., 2000). Inactivity-related negative health effects (i.e. obesity, diabetes) are even more severe for minority populations, particularly among Indigenous youth (e.g. Abbott et al., 2005).

In the light of this evidence, several groups have called for schools to serve as a intervention sites to address negative national health trends (e.g. the Prevention Institute of the American Academy of Pediatrics (2003), IOM (2013) and World Health Organization's (WHO, 1996) Global School Health Initiative). The Whole-of-School initiative (IOM, 2013) examined in this article was guided by Lohrmann's (2010) Ecological Model of the Coordinated School Health Programme.

Lohrmann's ecological model

It has been suggested that school health should be understood from a comprehensive perspective (WHO, 1996). Lohrmann (2010) has proposed using a broad health ecology model that included intrapersonal processes and public policy, as well as community and institutional factors. This ecological model of school health promotion had several advantages over previous models. First, it represents coordinated school health programmes and the possible mechanisms through which changes can occur. Second, the wellness/health coordinator, coordinating council (e.g. wellness committee) and team members are part of the model. Third, support is also provided by a second person at the school (beyond the wellness coordinator, who champions the cause). Fourth, family and community involvement are a central part of the model. Finally, the inclusion of policy in the model is important since this can both promote and constrain change initiatives.

An earlier Comprehensive School Health (CSH) Model (e.g. Allensworth and Kolbe, 1987) had eight components: (a) health education; (b) physical education and physical activity; (c) health services; (d) nutrition services; (e) counselling, psychological and social services; (f) healthy school environment; (g) staff health and wellness; and (h) family and community involvement. Shortcomings of this earlier model were identified by Lohrmann and addressed in his later model including, specifically recognising the importance of 'social-emotional climate' as well as 'family and community involvement'. Lohrmann's model also has four concentric rings that indicate coordination between the model layers. The aforementioned components and coordination between them is also addressed in the recently developed Whole School, Whole Community, Whole Child (WSCC) model (ASCD, 2015).

Ecological models for school health

Ecological models have been used in school health intervention projects in order to include the known correlates of physical activity in multilevel interventions. Adult studies have shown that at

the interpersonal level, biological, psychological, cognitive and emotional factors, along with some behavioural attributes and skills, are related to physical activity patterns. Social and cultural factors include physician's influence as well as peer and family support.

Environmentally, climate and season of the year are related to students' participation in physical activity along with access to programmes and facilities. Sallis et al. (2001) reported that combined physical and social environmental variables explained 40%–60% of the variance in student physical activity at schools. Whole-of-School models have shown effectiveness in increasing the adoption of healthy behaviour in schools. Specific to programmes focusing on healthy lifestyle behaviours, positive student outcomes have been documented related to physical activity (Jones et al., 2008), fitness (Shaya et al., 2008), body composition (Nemet et al., 2005), healthy lifestyle behaviours (Harrell et al., 2005), self-management behaviour (Mahar et al., 2006) and healthy living knowledge (Nemet et al., 2011).

Creating health changes in schools is a multifaceted and complex affair. Using Lohrmann's (2010) Ecological Model of the Coordinated School Health Program in the current longitudinal study provides us with an understanding of how and where change initiatives may be facilitated and hindered. The purpose of our investigation was to use Lohrmann's model to examine one school district's efforts to change a school culture in support of a Whole-of-School health initiative. Specifically, the study investigated (a) what factors influence participants' decisions to become and remain involved with the Whole-of-School health initiative and (b) what are participants' perceptions of the change forces that enabled or hindered participation in the Whole-of-School health initiative?

Methods

This study is part of a larger investigation focused on a school district's 5-year effort to develop healthier school settings. The district is located in the USA and primarily serves (95%) Indigenous students. It should be noted, however, that only about one-third of teachers and others employed by the school were of Indigenous decent. There are three schools in the district: a primary, middle (junior) and high (secondary) school. The district has faced many challenges related to (a) unusually high levels of administrator and teacher turnover, (b) low standardised test performances and (c) irregular student attendance and low retention rates. The community also has many families dealing with serious health issues, including diabetes and obesity.

Intervention experience

Over the course of a 5-year Whole-of-School health initiative, physical education teachers received professional development (e.g. 10 workshops per year for the final 3 years), additional equipment, along with mentor teacher and curricular support. Classroom teachers and other school personnel (e.g. psychologists, resource teachers) were provided with extensive professional development related to classroom activity breaks and teaching/content knowledge related to physical activity and the US Department of Agriculture's (USDA) food pyramid/plate (www.choosemyplate.gov). Classroom appropriate equipment (e.g. pedometers and equipment such as beach balls and bean bags) was also provided to teacher participants. External and peer mentor teachers were assigned to the participants, who completed monthly written reflections on lessons taught and healthy behaviour content knowledge integrated throughout the school day and beyond (e.g. in homework assignments). School meal services were changed at all schools and students were no longer allowed to bring food into the schools (most students ate both breakfast and lunch at school). The

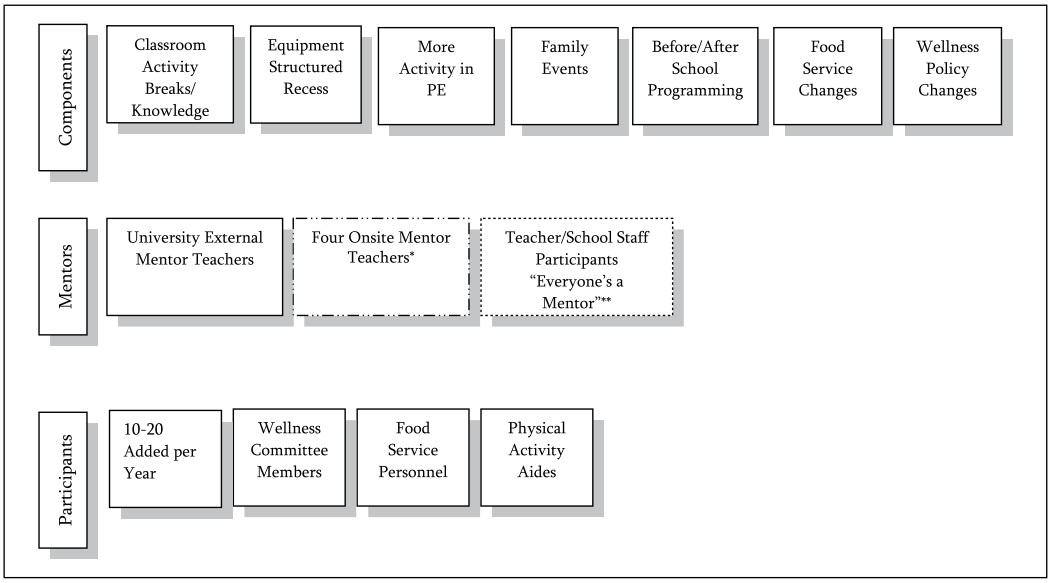

Figure 1. Whole-of-School programme design: healthy and active.
*Component added in year 4; **component added in year 5.

school district's wellness committee met monthly, and regular family and community events were scheduled that included a focus on healthy food and physical activity. In each year of the programme, additional school personnel and teachers were added to the project. Experienced participants were given the option of serving as peer mentors. Human subjects and project approval were obtained from the community, teachers, students and Arizona State University, USA. Figure 1 provides an overview of the programme.

Participants

Survey. All school personnel who had been involved in the project at any time and who were still with the school district ($N=84$) were asked to complete a survey. A total of 81 participants completed it. Paper copies of the surveys were delivered to and picked-up from individual teachers by P.H.K. The group included both men (39%) and women (61%) of Indigenous (32%), Caucasian (47%), African-American (12%), Asian-American (6%) and Hispanic (3%) heritage. Teachers indicated that they had between 1 and 36 years of teaching experience ($M=8.22$, standard deviation [*SD*] $=6.93$). They represented all grade levels, with participants at both secondary ($n=34$) and primary ($n=47$) levels, with three teachers' levels unspecified. Their roles were teachers ($n=52$), resource teachers ($n=7$), librarians ($n=2$), military training specialists ($n=4$), administrators ($n=4$), culture specialist ($n=1$), psychologist ($n=1$), coaches ($n=2$), curriculum specialists ($n=2$), food service personnel ($n=1$) or unspecified ($n=8$).

Interview. A subsample of 30 participants (9 men; 21 women) agreed to participate in a follow-up interview about the programme. A total of 19 participants came from the primary level and 11 at the secondary level. Interviews were conducted with a variety of school personnel, including teachers ($n=22$), administrators ($n=2$), psychologist ($n=1$), curriculum specialist ($n=1$), culture specialist ($n=1$), resource teacher ($n=1$), librarian ($n=1$) and nutrition specialist ($n=1$). This

subsample reported a range of years of teaching experience ($M = 7.33$ years; $SD = 4.72$) and ethnic background, including Indigenous (15%), Caucasian (61%), African-American (8%), Asian-American (8%) and Hispanic (8%) heritages.

Instruments

Survey. Based on Lohrmann's model, six items were developed for each of the five categories in the model (individual, interpersonal, community, organisation and policy). Five content experts reviewed the items for appropriateness. They placed them into the five categories of the instrument with >95% agreement and no suggested changes to the content. The final 30-item instrument had high internal consistency reliability ($\alpha = .95$). The survey focused in detail on the previous 3 years (intensive programming) and asked teachers and school personnel to respond to the following question: 'How important were the following factors in your ability to participate in the healthy living initiative over the last 3 years?' Sample items from each of the five ecological areas are as follows: (a) my use of physical activity break cards/break ideas from workshops (factor: individual); (b) enhanced communication with parents (factor: community); (c) the school has had a stable leadership with support for the programme (factor: organisational); (d) meeting wellness policies (factor: policy); and (e) working with onsite teacher mentors (factor: interpersonal). Participants responded on a Likert-like scale from not important (1) to extremely important (5).

Interviews. Interviews were conducted in order to gain a deeper understanding of stakeholders' perspectives on the initiative. They were conducted during the school day on a day and at a time convenient to participants. Interviews were framed by a general interview guide and were semi-structured to allow for follow-up probes. Interviews lasted 15 to 50 minutes, were recorded and then transcribed. Participants were asked about changes in their schools and their involvement in the project. They were prompted to respond to questions that focused on issues relating to policy, school, individual, community, family and culture in order to learn more (beyond the survey) about the influences that helped school personnel move towards changing the culture of the school district community to one that was healthy and active.

Data analysis

The six items within each of the five school health ecology categories were summed to provide a total score and averaged to create a statistical mean for the category. Descriptive statistics were calculated for all items and for the five factors. A *t* test was also run with the five factors by participant group (teacher or other school personnel) in order to investigate possible differences in views of the influence of factors by participant role.

Interview data were analysed using analytic induction to identify common themes (LeCompte and Preissle, 1993). Analysis began with the repeated scanning of the data to enhance familiarity and to identify some initial themes. Data were then examined to identify shared experiences across school personnel as well as negative cases that represented the views of individual participants (including reviews across teacher experience, grade level and subject matter). Care was taken to examine data relevant to each of the coordinated school health programme categories (individual, interpersonal, community, organisational and policy) in order to extend understanding of the perceived impact of these on school personnel's ability to participate in the initiative. Trustworthiness measures included the use of researcher and data triangulation and a negative case search. For organisational purposes, the thematic results are presented using the framework suggested by Lohrmann's (2010) model.

Results

Survey findings

Data lend support to the Whole-of-School model of school health promotion as all category mean values were rated highly (above 3.5 on a 5-point scale). Category mean scores were as follows: (a) organisational ($M = 3.86$; $SD = .76$), (b) policy ($M = 3.75$; $SD = .94$), (c) community ($M = 3.68$; $SD = .93$), (d) interpersonal ($M = 3.63$; $SD = .91$) and (e) individual ($M = 3.63$; $SD = 1.00$) factors.

The 10 items that were rated the highest by the participants listed in order were as follows: (a) importance to the community (community); (b) school resources being allocated for the Whole-of-School health initiative, including supervised physical activity opportunities before/after school and at lunchtime (organisational); (c) schools having stable leadership supportive of the programme (organisational); (d) personal wellness (individual); (e) working with university mentors or an external support system (interpersonal); (f) meeting school policies (policy); (g) organised fun runs for the community (community); (h) grade level (individual); (i) the use of physical activity break cards/break ideas from workshops (individual); and (j) working with multiple teachers (interpersonal).

T-test results showed that the teacher group versus the other school personnel group differed in their views concerning the influence of two of the environmental factors in changing the culture of the schools towards health: community ($t(75) = 6.57$, $p = .01$, partial $Eta^2 = .08$) and organisational ($t(75) = 4.37$, $p = .04$, partial $Eta^2 = .05$), with the 'other school personnel' rating both of these environmental influences higher than teachers (for community $M = 24.42$ [$SD = 5.96$] vs $M = 21.04$ [$SD = 5.96$]; and for organisational $M = 24.75$ [$SD = 4.68$] vs $M = 22.43$ [$SD = 4.42$]) with a range of 1–30. It is important to note, however, that the effect sizes of these differences were very small.

Interviews

Similar to the survey data, participants commented on the importance of a wide variety of factors related to change and the school culture. No single area within the model dominated discussions, and the interactive and mutually influencing nature of the ecological model of the coordinated school health programme was evident.

Community factors

All the teachers showed cognisance of the uniqueness of their school community and its importance in the programme's overall success. Mr Davidson[1] (secondary administrator, Caucasian) commented on the positive aspects of the community: 'Their tribe wants their people to be healthy. That's part of their mission goal. That's in their statement. They want the community to be healthy'.

The community more generally was attempting more physical activity programming, and some of the teachers tried to tie school activities into those offerings. Ms Parker (elementary teacher, Indigenous) described a recent half marathon on the reservation and its relationship to the school's monthly fun run:

> So I think that – I think from then, they saw what it was, so they would want to enter more races and we ran a 5K – not a half marathon, it was a relay. And so I have a picture there of our team and so I showed the kids and they were really excited about it. I mean, they were – they got really – they get really, oh,

> yeah! And so and they also heard about the other kids that ran in it and so I think that really excites them about being physical and running and even, like, running club, working for those miles. They get really excited about that and just practicing for it. We have fun runs almost once a month and practicing for that and I know at home, some of them practiced, so that they can try to be good at the fun run.

More often, however, teachers and school personnel commented on the challenges that faced the school initiatives due to community health difficulties. Teachers were aware of some of the negative health trends in the community, as Ms Delaney (elementary teacher, Indigenous) noted:

> These kids are the number one population for diabetes in the United States. Because of their normal, natural diet when they were first cultured here, they ate squash, beans, corn, all the healthy stuff and today's diet doesn't work for their metabolism. The things they eat which are now incorporated in today's diet, fast food and all that really goes against them. They have diabetes more than anybody else. They have obesity more than anybody else. You see so many with wheelchairs. The chances of our kids having diabetes are really high.

One positive aspect of the negative health trends was that the students' health needs often served as motivation for teachers and school personnel to participate in the programme. Participants also recognised the limits of the school programming because students' time at school was limited compared to time at home. Mr Sharpe (secondary teacher, Caucasian) described the need for parental support for the healthy messages:

> After school it's their parents. If their parents allow them to do what they're doing, sitting around and watching TV and drinking soda and eating chips all day long then there's really not much we can do about that.

Ms Pablo (elementary teacher, Indigenous) shared what she had heard and seen from others in the community as well as parents partnering in the intervention's efforts:

> I think it's kind of sad to say, but it's kind of almost normal that 'I have high blood pressure' or 'I have diabetes' and that we don't necessarily eat the best way. I see parents really trying to make sure that they follow the rules and they bring healthy snacks for here when we have parties. We just had a Halloween party and it was really good to see the parents bring fruit and healthy juice boxes.

Connecting school programmes with parents and community is a challenge regardless of the setting, but the uniqueness of this school population and the predominance of faculty from non-Indigenous populations increased the difficulties. The programme attempted to respond to this challenge by working closely with tribal leaders and educators. One way this was done was to include culturally relevant materials whenever possible, for example, a local Indigenous food pyramid (i.e. diagram of recommended Indigenous foods) was used by some of the teachers in their lessons. Teachers also brought culturally relevant examples related to movement and healthy behaviours into their classrooms. Mr Sisco (primary teacher, Indigenous) explained,

> I let them be imaginary. They'll use their imagination. I let them see how they're going to move to a song, and you apply, and let's see how you can do it. Just an example: You're at a powwow. Okay, how would you move to this song? How do you move to the song? If this song is playing, the flute is playing and it's slow, they're all gathered in a circle, and then all move slowly. Okay. Let's play this song. How do we do it now? And it got really radical, because that's what they saw.

Organisational factors

At the organisation level, a common issue discussed by teachers was the presence of administrator and staff stability, which allowed for focused and continued involvement in the Whole-of-School changes. Mr Goldman (secondary teacher, Caucasian) explained,

> Well, we went through one, two, three, four – four principals in six years and that's going to play havoc with your staff. There are four of us, I think, still here that were here when I started. The one [principal] we have now I think is in his fourth or fifth year and he was an athletic individual in his high school days and he coached athletics and now we have a vice principal who, too, is a former coach and interested in athletics and we have several of our staff that were athletic and we – I think we saw the need that these children that we teach were going to have a hard time with life if we didn't get them up and moving.

With increased administrative support, teacher stability and support followed. Although the schools still faced higher turnover than many districts, a cadre of experienced teachers developed engaged in the healthy school programme. Teachers involved in the programme appreciated the continuing professional development opportunities, but often had differing ideas about how future programmes should operate. Some of the teachers liked the programmatic approach adopted whereby they could select from multiple resources. As Ms Delaney (elementary teacher, Indigenous) explained,

> The materials and the workshop that I did at the beginning all helps. Each time I get the new folders and I look through the activities, I kind of sort, this will work, I guess, this one, I don't know if they can handle. So, those worksheets in those little pamphlets and things are definitely helpful because I wouldn't have thought, or been able to integrate that, with all that in front of me …

Policy influences

The two most frequently addressed policy issues were an internally developed school food policy and the externally mandated state academic testing programme. With regard to food policy, dramatic changes had occurred over the last 5 years as the schools' personnel moved from using ice cream and pizza parties as a rewards for students positive behaviour in the classroom, to institutions that forbade bringing in food from the outside. Mr Sampson (secondary administrator, Caucasian) described the policy:

> Our school does not allow them to bring any outside food or drinks into the school. The only thing they can bring into the school is the water that they can also get from the school, which is good … and we don't allow them to have the snacks, like we don't have the vending machines on campuses where a lot of the schools do.

The cafeterias also made significant changes as Ms Linton (elementary resource teacher, African-American) described:

> In the cafeteria they try to promote healthy eating and even exercise. They put – they have all types of materials in the lunchroom to teach them about eating and portions, what fits into where. So I would say they are most definitely getting it from the lunchroom. Even if they can't read it, looking at the pictures should give them an idea of what they should or shouldn't be doing exercise and eating wise.

Teachers noted student grumbling at some of the food policies, but also observed a positive student response from others. Ms Delaney (elementary teacher, Indigenous) described the student response as follows:

> So impact, I know when we first started the cafeteria, we first started to do the healthier type of eating the kids complained a lot but that was three or four years ago and they're not complaining as much and they tend to eat it and now they're doing a salad bar. I've been noticing a lot of our kids who will stop at the salad bar and they'll get salad in addition to their food. So that's something that never used to happen. Of course we didn't have a salad bar but when we first started it the kids didn't, none of them took salad. Now I would say 25-35% of our kids are stopping to have a salad everyday with their food.

A negative policy from the teachers' perspectives, and one that the school district could not alter, was the state mandated academic testing programme. This affected some teachers' willingness to be involved in the initiative due to standardised test pressures. Ms Emerson (curriculum specialist, Caucasian) described the challenge of fitting in all the academic materials:

> Well, in class time, time is very precious. It's very precious; we have so many programmes going on, new implementations going on in different grade levels. Like, we're just now implementing a new social studies. We're implementing a new math programme. We're implementing a new strategy for reading. So, time is very precious.

Several teachers saw benefits in the physical activity breaks and academic performance. Ms Calvin (elementary teacher, Caucasian) described these as follows:

> Well, that they're alert and engaged and participating in more than just the physical because as soon as we finish the physical activity and transition into the academic or even if it's incorporated in with the academic, I have a higher engagement level overall …

Individual factors

Key to teachers' use of the programme was their sense of personal efficacy with respect to content and management. From a content perspective, some teachers were apprehensive about teaching nutrition, in part because during the school intervention the food pyramid/plate changed.[2] Mr Goldman (secondary teacher, Caucasian) talked about his upcoming nutrition lesson:

> I'm a little worried, because I don't know it. But I'll have to learn it, and slide it down, and then do it. And it's a different kind of teaching than math, so it's kind of trepidation, but then also it makes you better at teaching. Everything you teach, you learn from. But yeah, I'm a little nervous about it.

The most commonly expressed concern at the individual level, however, related to class management. Ms Bailey, a first year teacher (elementary, Caucasian), described her experiences:

> I've tried two or three activities and it's hard to get them back once you start it. So it's not working quite like I was hoping and I haven't really figured out a – I haven't really had – and I haven't – because I'm a fairly new teacher, it's hard for me also to have the time to figure out how I can integrate it into each particular lesson. So I'm having some challenges with that as well.

Another factor at play in individuals' response to the programme was the teacher's commitment to physical activity in their own lives. In an earlier description of the school administration, Mr Goldman (secondary teacher, Caucasian) specifically pointed to the athletic experiences of the principal and assistant principal. Past experience with the notion of healthy living concepts seemed to increase teachers' perceived efficacy and motivation as Ms Hulman (secondary teacher, Caucasian) described:

> … that's something that I feel comfortable with anyway because I've always been kind of athletic and very interested in health and nutrition so that's not something that's totally foreign to me.

Mr Langley (secondary teacher, Hispanic) voiced a similar sentiment: "I was raised being very active and I know the importance of it. So when this programme came along I easily said, wow, I could make this work."

Interpersonal factors

Teachers' support for the programme also depended on interpersonal factors, in particular colleagues' reactions and support, and most importantly, the students' response. This programme was unique in that it provided teacher support in the form of workshops, external mentors and peer mentors. Mr Casey (secondary teacher, Caucasian) noted the contributions of each of these elements:

> Other teachers have had pretty good ideas. We do have meetings here, so they share some of the activities and actually just yesterday we had a meeting and a couple of the teachers shared what they did in their classroom that I really enjoy and so I definitely want to try some of the things that they've done in their classrooms and then the people from the university [external mentors] that were leading the meeting, they also has us do some of the activities around the classroom that I really enjoyed too. That's the thing about teaching, teachers always feed off of each other and share great ideas and I think that's really important because none of us have all the answers.

By far the most important interpersonal factor was the student response to teachers' implementation of the healthy school lessons. Ms Hulman (secondary teacher, Indigenous) shared her definition of success with regard to the programme:

> Whether the students seem happy. Whether the students are learning, and you can tell that by exams. The lack of discipline problems, if there's less discipline problems because of giving them more time to do their thing, or getting decently active, you have less discipline problems.

Ms Delaney (elementary teacher, Indigenous) offered a similar response:

> To me it works if it achieves your goal, which it did, and the kids had fun doing it which they did and they weren't complaining about it and every time we do it they're like, yeah let's do that. They like the activity. They like the movement. It's a positive experience for them. That's how I consider whether it works or not.

Discussion

In this study, 'the seeds of changes that eventually occurred had been germinating for years' (Neumann, 1998: 4) or as one of the teachers in the study put it:

> I think to keep going, to keep doing what we've been doing. It's working. It might not happen as fast as we'd like it to but I've noticed so much change. I know that it takes ten to twelve years to affect change. So some of the things that we're seeing happen now we started ten years ago.

This reminder that change takes time and that planted seeds of change must be nurtured for a few years is one of the important take home messages from this investigation. It is important to note that prolonged support for the intervention throughout 4 of the 5 years of the programme had

been provided by a grant from the US Department of Education. However, many of the materials used (e.g. classroom energiser ideas, nutrition information) and some of the components of the intervention (e.g. peer mentors) could be implemented with little to no cost to a school district considering a similar programme. So, lack of external funding should not be a barrier to the development of similar Whole-of-School initiatives in other settings.

What is clear from the survey and interview responses is that both internal and external forces are at play in school health. Because of this, comprehensive models such as Lohrmann's (2010) and the WSCC (ASCD, 2015) are well suited to better understanding school health and appropriate interventions. These findings also support Sallis and Owen's (2002) suggestion that in order to change schools and communities into health promoting environments, multilevel efforts are needed.

In discussing the important components to sustainable healthy school communities in Canada, Stolp et al. (2015) identify stakeholder buy-in and adequate human resources (e.g. partnerships and peer support) as key to success. Storey et al.'s (2011) investigation of a Canadian healthy school approach in the form of APPLE Schools also illustrates these multilevel factors, with teachers' reporting the importance of support, leadership, clearly defined roles, embeddedness in school culture and stakeholder involvement.

What prior models have perhaps not emphasised enough, however, is that the multiple components and complex interplays within the model may not be uniformly experienced and perceived by the individuals involved. For example, some school personnel members may view the influence of policy as critical to creating a healthy school using a Whole-of-School model. Not all teachers in this study, however, saw policy as an important factor affecting their ability to participate in the school health change project.

These complex relationships were also highlighted by Caravella et al. (1996) in a Whole-of-School initiative implemented across nine schools in the state of Wisconsin, USA. Sometimes the interplay between factors may be so complex that it is not possible to distinguish the specific change force that enhanced or impeded a programme's success. For example, in the current project the community and related student health needs were strong motivators for school and teacher involvement, yet features of that same community were sometimes seen as primary barriers to success.

Another example of the complexity of factor interaction can be seen in the effects of the state level policy of mandatory academic testing. For some teachers, physical activity breaks were seen as a positive classroom addition that helped students engage, learn and focus, while other teachers found them a distraction in an already crowded school day. Future interventions should consider different 'tracks' or entry points in the intervention that better fit individual teacher needs.

Future interventions should also be cognisant of not just a local culture's health needs, but also that culture's views about health. In this study, tribal leaders worked closely with the planning team to make the project culturally relevant to the wider community. Mundel and Chapman (2010) in Canada similarly used decolonised practices to approach their health promotion project holistically drawing on Aboriginal practices rather than a more typical biomedical approach.

Ultimately, it is the individual who is at the heart of culture change. Only when the individuals changes their beliefs and behaviours, when those behaviours are sustainable, and when those involved are empowered and understand the change, can lasting change occur (Drapeau, 2004). Being a part of this Whole-of-School initiative required teachers to re-conceptualise their roles from teaching content matter to teaching the whole child across the curriculum.

Culture can be a contested terrain. While most of the school personnel/teachers in this study saw the value in the programming, change was not implemented in the same way across classrooms and school roles. Additional work is needed in a wider variety of settings to better understand teacher adoptions, adaptations and avoidances of Whole-of-School approaches.

Given widespread attention on children's obesity and health issues, it seems likely that schools will continue to be viewed as important settings for enhancing children's health knowledge and experiences. To promote positive change for both the students and the adults involved in school initiatives, the health ecology of the school must be understood in its complexity. This investigation provides important insights into how this might be achieved.

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Notes

1. Pseudonyms are used for all participants.
2. The US Department of Agriculture (USDA) changed the youth food guidelines from a graphic of a food pyramid to a graphic of a food plate, kindly see www.choosemyplate.gov for further information.

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