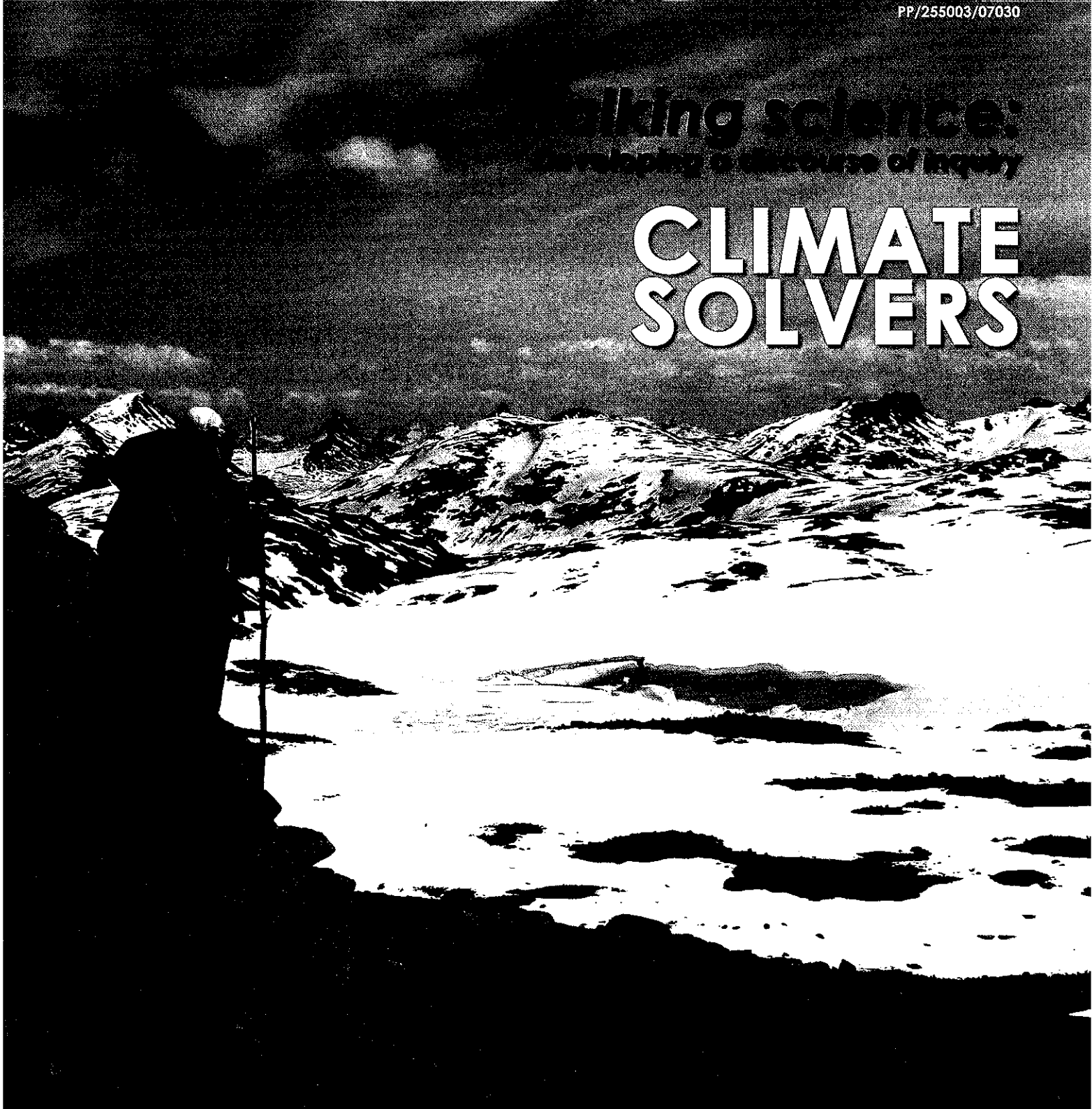


**Walking science:  
developing a discourse of inquiry**

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# Connecting young people via place

By Kimberley Wilson and Kellie Stemp

Edmund Rice Education Australia Flexible Learning Centres (EREAFLCs) operate within a social inclusion framework to 'walk with' young people who have disengaged from the traditional schooling system. Students attending the centres face multiple stressors in their everyday lives, as well as significant barriers to achieving success in the classroom environment. Addressing the immediate literacy and numeracy concerns of students as they present at the centres has left little time to formalise strategies for engaging students with traditionally 'difficult' subjects such as Science. In addition, there is very little research material available to assist teachers in the development of teaching and learning strategies for science education that deal with the unique situation of the flexible learning context. The aim of this research project has been to work with Flexible Learning Centre staff to identify and trial a range of science teaching strategies to enable the conceptualisation of a general framework to guide future science curriculum development. This article details one unit of work undertaken with an outreach annexe of the Flexible Learning Centre Network located in a regional area of North Queensland. The trial involved implementing an environmental regeneration unit based on the philosophical principles of a place-based education approach in order to ascertain the potential of such an approach to engage disadvantaged young people.

## **EREAFLC NETWORK AND OUTREACH SERVICES**

The EREAFLC Network aims to provide a flexible, relevant and supportive educational experience that will enable young people to find their own pathway in life. Teaching and learning is characterised by *small class sizes, a flexible curriculum that draws on individual interests and needs and a democratic pedagogical approach that encourages learner empowerment and autonomy* (EREA, 2008, p.2). Educational outreach services are an integral component of the Flexible Learning Centre approach, as they ensure equity of access irrespective of geographical location. There are currently seven outreach services operating across Queensland.

## **It'sUp2U OUTREACH NORTH QUEENSLAND**

The *It'sUp2U* Outreach Program commenced in 2006 with an initial cohort of ten young people, a youth worker and a teacher. Since then, the program has expanded to a group size of fifteen young people, with continuity of staffing over the three years of operation. The program itself is mobile and is best defined as a

Whilst there is more diversity than commonality amongst young people's backgrounds, students attending the outreach service have typically experienced one or more significant and complex educational, social, developmental, psychological, health, legal or familial situations which demand unique responses. As a result of life circumstances, students have often experienced major disruptions to their schooling experiences, such as extended periods of absence that have impacted on the development of their basic academic skills. Available data from the EREAFLC Network indicates that approximately 70% of the student population experiences literacy and numeracy difficulties with 30% identified as having a suspected disability impacting on learning and 5% presenting with a diagnosed disability (EREA, 2008).

Whilst there is criticism of literature that overly focuses on the challenges and limitations experienced by disengaged youth (Te Riele, 2008), it is important to recognise that these issues figure strongly in the outreach context and must inform teaching and learning practice. Burck (2008, p.1) provides an interesting analogy that perhaps encompasses both the strengths and challenges characteristic of disengaged young people:

*Kaleidoscopes and young people have a great*

relationships for young people, it is often the case that relationships outside their inner circle have been characterised by marginalisation, discrimination, rejection and failure. As a result, there is little sense of reciprocal responsibility or obligation to the wider community either for or from these young people. Teaching staff believe that if students can contribute positively to their own families and cultural communities, as well as to wider society, they may be seen - and in turn see themselves - as agentic individuals capable of effecting change at both an individual and community level. In order to best facilitate this contribution, the integrated curriculum philosophy of the Outreach Program is based on a combination of two interrelated ideas, that of Place-Based Education and Social Capital Theory.

### **Place-Based Education**

According to Smith (2002), a place-based education approach is essentially concerned with grounding educational activities in local phenomena and students' lived experiences.

Woodhouse & Knapp (2000) note the importance of delineating between the evolving concept of *Place-Based Education and the related approaches of Outdoor Education and Environmental Education*. While a place-based approach encompasses the experiential and ecological sensitivities and concerns of both outdoor and environmental educational approaches, it is most specifically concerned with the dynamics of a particular place. To use a 'place emphasis' within a study module means to look at all aspects of the specific geographical location: its history, geography, ecology and anthropomorphic purpose. As such, it is a multi-disciplinary approach (Woodhouse & Knapp, 2000).

A place-based approach connects place with self and community, with a focus on sustaining cultural and ecological integrity (Woodhouse & Knapp, 2000). In relation to the cultural backgrounds of the young people attending the Outreach Program, Aikenhead (2006) has emphasised the context-bound nature of Indigenous learning as learning occurring about a particular place. Ardoin (2006) discusses the notion of 'place identity' that develops through relationships with places and can be an important factor in developing self-concept. The Wetlands Project detailed in the following case study provides a 'place' perspective through its location within the local area and incorporation of Indigenous perspectives, as well as the connection between the wetlands area under rehabilitation and larger ecosystems such as the ocean and Great Barrier Reef.

affect the social capital outcomes that students experience. She notes that social capital can be both 'good' and 'bad', an idea of particular importance in the outreach setting where social capital may play a critical role in affecting learning outcomes for students from diverse backgrounds. For the teaching staff of the Outreach Program, this expanded definition takes into account their observation that young people often form relationships based around activities which do not support their physical, mental or emotional wellbeing. Focusing on social capital in this context involves creating opportunities for young people to form relationships based on social rather than anti-social activities. It also involves creating an extended web of relationships to offer young people a wider array of choices in relation to realising their full potential. Science education as a method of enabling the building of social capital is perhaps not a common conceptualisation and there are limited tools available for assessing a causal relationship between the two. However, an additional research project connected with the EREAFLC Network is investigating in more depth potential avenues for assessing and formalising the contribution of social capital to students' learning outcomes.

### **Engagement with Science**

Of key interest to both teaching and research staff involved in the Wetlands Project was the ability of the place-based education approach to engage young people in science education activities. Informal discussions with young people early in the project relating to their general experiences with Science indicated a history of either failure or lack of exposure to the subject, with a resulting common attitude that 'Science is yuk'. This sentiment from the young people was in fact so strong at the commencement of the project that the word 'Science' was omitted from any discussion of the project activities in order to prevent further disengagement.

Aikenhead has previously conceptualised Western Science as a 'sub-culture' in that it is:

*characterised by a well-defined system of norms, beliefs, expectations and conventional actions. He has elaborated on perceived attributes of this sub-culture in describing it as: mechanistic, materialistic, reductionist, empirical, rational, decontextualized, mathematically idealized, communal, ideological, masculine, elitist, competitive, exploitive, impersonal and violent (Aikenhead, 1997, p.220).*

In comparison, science education frameworks that have been developed to embed an Indigenous world view focus strongly on elements of connection, belonging, identity and place (see, for example, Lewthwaite, 2008). Negative prior experiences of

focus. Such a unit would conceivably fit well within a place-based education approach as it would enable young people to become actively involved in a restoration project connected to their own place. Intended as a predominantly outdoors-based unit of work, it would build on students' preference to be involved in hands-on, experiential activities. This focus would also allow students to demonstrate different strengths than those commonly recognised in a traditional classroom setting and thus might contribute positively to students' self-esteem and sense of agency.

### **Conservation Volunteers Australia**

As discussed above, the building of social capital is an important focus for teaching staff. For this reason, staff sought to form a partnership with an outside organisation, even though the teacher in charge possessed a background in biological sciences and was well equipped to facilitate the unit. Conservation Volunteers Australia (CVA) was approached as a possible candidate as it is an organisation with a strong local presence in the regional community. As well as involvement in a number of environmental projects, the organisation acts as a service provider for the Green Corps Australia program, which provides training and employment pathways for youth in the area of natural resource management (DEEWR, 2009). In the local area, CVA employs a Coastal Education Officer, Scott Fry, who, when approached, immediately indicated his willingness to collaborate with teaching staff to develop an environmental regeneration project for the Outreach program.

### **Development of the Wetlands Project**

It was decided to focus the project on a local wetlands area that was a current CVA regeneration site, in order to enable sharing of resources and manpower if required. As well, the participants would be able to broaden their understanding of local conservation and land management through witnessing the current work of both volunteers and Green Corps employees. A unit of work was developed by Scott Fry that catered for the needs of the Outreach participants by emphasising a practical approach while encompassing authentic scientific and numeracy activities that would arise naturally within the context.

### **The Wetlands Site Activities**

The practical element of the project commenced with the young people being allocated a 10m x 10m plot at the wetlands site. The site was smothered in 2m high guinea grass, a local weed originally introduced as cattle feed. Over a period of eight weeks, the young

importance. It was decided that the project would commence with a tour by a local Aboriginal guide who would share with the young people traditional ecological knowledge related to native plants and animals, as well as traditional and modern Aboriginal philosophy related to land management and sustainability. In addition, CVA provided a number of locally-published resources to support the ongoing incorporation of Indigenous perspectives.

### **Integration of Multiple Key Learning Areas (KLAs)**

The Wetlands Project integrated the KLAs of Science, English, Mathematics and SOSE – both during field-based activities and those activities more familiar in a regular classroom setting. Literacy activities were specifically focused on developing relevant vocabulary associated with the wetlands unit of work. Mathematical activities related to the measurement and spatial dimensions of the project. A SOSE focus included discussions around the significance of the wider picture of human activity, ecological sustainability and climate change. It is important to note that the discussion of separate KLAs here is not representative of how the activities were presented to students. A deliberate effort was made to ensure that classroom and practical activities were seamlessly interwoven and were always relevant and connected to the progress of the wetlands unit. For some young people, completing any type of classroom activity can be a very real challenge, so relevance and purpose as drivers of motivation became a critical factor in engagement.

### **Assessment**

Formative assessment was decided upon as an authentic and inclusive evaluation method for the Wetlands Project. Digital photographs were taken at each stage of the project by both students and staff. A limited-access web page was developed on the Ning social networking site to allow young people to upload and share their images with students at other outreach locations across the State (this was particularly appreciated by students who attend an outreach located in a remote desert area of Queensland and have had little exposure to wetland environments). Students were required to rationalise which images were selected, as well as provide short captions giving information about them. Another project planned for the future is to have the young people develop an instructional booklet to act as a resource for other Outreach Centres which might like to complete a similar project.

## **FINDINGS**

### **Engagement**

was some initial discouragement due to the perceived enormity and physical demands of the fieldwork. As well, the physical conditions were difficult in that the project took place in the early part of the year, an extremely hot and humid time in the tropics of North Queensland. Initially, teaching and volunteer staff played a large role in motivating students to engage in the fieldwork, primarily by leading by example and encouraging students. It was often the case that teaching and volunteer staff would initiate involvement, the young people would watch this activity for some time and then, one by one, they would join in. Whether the students were motivated by guilt or inspiration, the lag time between watching and participating grew shorter on each subsequent field trip and eventually occurred in reverse – towards the end of the project, the young people were encouraging the staff when they became increasingly deflated by the heat.

An important element related to this change in student engagement that progressed over time might be the horizontal group cohesion that this project enabled. In describing an experience with a place-based education approach, Smith (2002, p.586) highlighted the fact that teachers acted 'more like partners than supervisors'. The willingness of teaching staff to actively involve themselves in the laborious activities appeared to motivate the young people and contributed to a sense of group obligation and responsibility.

Teaching staff also perceived that an important factor in engaging students was the immediate evidence of success at the completion of an activity. This occurred from the very first field trip experience. The difference in the wetlands site after the initial weeding was completed was visually startling, particularly as it seemed to take so little time. The transformation of the site from being overgrown with guinea grass to one on which just a small number of native plants were visible had a profound effect on both staff and young people. Lewthwaite (2008), in his work with Indigenous students in Canada, notes the motivating importance of allowing students to 'work to an end' or experience successful completion of a task.

As the unit progressed, students required less and less encouragement or prodding to become involved in either the field work or classroom activities. Instead of standing back, as was first the case, students began to ask relevant and pertinent questions both during the fieldwork sessions and as part of discussions immediately following. Students began to actively seek knowledge around the work that they were doing. An excerpt from observation notes below illustrates both the knowledge the students sought and the relationship formed with Scott Fry over the term:

*Student: Is it true that trees help us breathe?*

*Scott responded by explaining that trees convert carbon dioxide into oxygen and this is good for*

*have gotten [sic] to the point where they don't ask 'why' any more, they're not interested in anything that's going on around them. So to get them to ask the question 'why', I think is very important.*

## Change in Attitude

The change in general attitude of students over the course of the ten-week program was considered quite significant by the teaching staff. Students were initially resistant to the program, particularly in relation to the physical labour involved. However, a change was immediately evident as soon as the students put on their work gear, complete with fluorescent shirts and steel-capped safety boots. With the physical component of the work supported by more traditional curriculum activities, students came to an understanding and appreciation of the wider environmental significance of their efforts. To illustrate such a change in attitude, an initial comment was *You guys are going to waste us (overwork us)!* In comparison, towards the conclusion of the project another student exclaimed, *Hey, we're doing a really good thing for the environment here, aren't we?* They were able to recognise that they were also contributing positively to their community.

## Pathways to Employment

One of the senior students, a young Torres Strait Islander man who had started to think about transitioning to employment, gained a place in further training with CVA as a result of this unit of work. It is unlikely that he would have done so without having engaged in the Wetlands unit. Previously, the young person had not pictured himself as capable of physically laborious work. His success in completing the wetland activities transformed this self-image. As well, entry into the CVA training program required an interview with a panel. It is unlikely the student would have in the past attended or spoken up in such an interview due to limited experience with non-Indigenous people in such a formal setting. With Scott Fry being part of the interview panel, the student felt comfortable enough to attend and engage in discussion during the interview. Feedback from the panel indicated that this student was considered one of the best candidates they had interviewed. Follow-up with this student since he has transitioned from the Outreach Program and commenced training indicate that he has made changes in his lifestyle that support his commitment to the CVA Green Corps, and also increase his overall health and wellbeing. In this case, a partnership with CVA truly resulted in an increase in social capital.

## CONCLUSION

A place-based education approach was considered the most amenable to bridging this disconnect due to its similarity in philosophy to those approaches that have been seen to work best with young people from diverse backgrounds. This approach also presented possibilities for the development of positive social capital which is considered of high importance by teaching staff in expanding the pathways available to students.

The student outcomes that have been defined as important, in particular those of student engagement and social capital, may seem to be only of particular significance in this context. However, Brown (p.452) notes that:

*excluded students hold valuable insights that researchers and practitioners can draw on to improve the schooling experiences of those most vulnerable to academic failure and to social marginalisation within and beyond our nation's public school systems.*

Overcoming the sense of disconnect that the general population of young people experience in relation to science education is a challenge that impelled Tytler, in 2007, to call for a 'Re-imagining of Science Education'. Perhaps further exploration into the merits of a place-based approach can be part of this re-imagining.

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