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Champions or Helpers: Leadership in Curriculum Reform in Science

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Abstract

This study describes the perceptions of embedded teaching and learning leadership teams working on curriculum reform in science teaching departments. The teams combined a formally recognised leader, School Director of Learning and Teaching, with a project-based, more junior academic, Curriculum Fellow, to better leverage support for curriculum reform. Teams were established on the principles of localizing support and maximising credibility with discipline staff. The core teams were supported by a larger Faculty team of Associate Dean Academic, academic developer, educational designer, first year coordinator and project manager. Key themes emerging from the collected data were the complementary roles of members of the team, different perceptions of leadership between the School Directors of Learning and Teaching and the Curriculum Fellows, the importance of acting locally within the disciplines and the synergistic value of working in a team. The combination of formal and informal leadership aggregated into the FSTE School teams offers a model to support sustainable improvement in science teaching and learning in higher education.

Introduction

Science academics have been criticised for slow adoption of validated teaching strategies despite decades of educational research into higher education (Dancy & Henderson, 2008). This has been attributed at least partially to a lack of understanding of the value of educational research and also a lack of engagement with educational literature (Anderson et al. 2012). It has been suggested that science academics who combine familiarity with educational research and disciplinary expertise offer the capacity to translate best practice in teaching and learning into the science teaching context and the potential to lead the adoption of new teaching practice by colleagues (Bush et al. 2011). Science academics are also more likely to adopt new approaches to teaching if suggested by science colleagues rather than educationalists (Dancy & Henderson 2008, Anderson et al. 2012). This has been observed in the Australian context where Burke da Silva et al. (2008) found informal advice from colleagues was more likely to influence science academics than published information. Marriage of the two principles of developing local expertise and leadership and influence through trusted colleagues led to consideration of distributed leadership models for curriculum reform in Faculty of Science, Technology and Engineering (FSTE), La Trobe University.

Distributed leadership in higher education

Distributed leadership arises from the work of a group of interacting individuals who work separately but interdependently on completing a common task. The total effect of the distributed leadership approach is greater than what could have been achieved by an individual (Spillane, Halverson & Diamond 2001, Gronn 2002). The approach builds on the contribution of individuals working in both formal and informal leadership roles within a team, rather than being constrained by the capacity of the formal leader/s (Spillane, Halverson & Diamond 2001). A distributed leadership model also recognizes that expertise is distributed amongst the individuals within the group thereby capitalizing on the skills and qualities of individuals in the workforce (Spillane, Halverson & Diamond 2001, Gronn 2002).

Leadership of curriculum reform in higher education involves the creation of a vision for teaching and learning which is communicated effectively to key stakeholders so that they are motivated and inspired to align themselves and their resources with the vision (Marshall et al. 2011). Achieving the desired curriculum reform involves organization and management of plans, budgets and staff, as well as monitoring and problem solving as the project progresses (Marshall et al. 2011). Enactment of the institution's vision for curriculum reform occurs at the Faculty, School and Department levels where institutions rely on individuals such as Associate Deans Academic, Heads of School and Heads of Department to interpret institutional strategies, translate them into faculty or departmental actions and enable and motivate their staff to enact them (Marshall et al. 2011).

The context in which a leader is working is a critical consideration, particularly in the current higher education climate where leaders are constantly negotiating between competing choices, priorities and interests (Middlehurst 2008). Heads of Schools and Departments lead and manage a broad portfolio of research, teaching and administration for their unit and in science departments in particular, the emphasis is on building a workforce of young scientists (Gibbs, Knapper & Piccinin 2008). To cope with the complex, varied and often competing objectives of university work, leadership tends to be widely distributed across organizational units (Gronn 2002, Bolden,

Petrov & Gosling 2008). When investigating the leadership of departments with an excellent teaching record, Gibbs, Knapper & Piccinin (2008) found that individual leaders who were aware of their own lack of expertise in learning and teaching, often gave authority to members of their teams who were widely recognised as excellent teachers and innovators. This study explores the nature of key leadership roles in a major curriculum reform project, *Design for Learning* (DfL).

Design for Learning in FSTE

Major activities in the curriculum design component of the *Design for Learning* (DfL) project within the Faculty have been: definition of Faculty Graduate Capabilities (FGCs) and course learning outcomes, mapping FGCs to ensure development through the redesigned curriculum, constructive alignment within subjects and the development of shared practice in teaching delivery. Each of these elements of curriculum design was achieved through the work of course, subject and discipline co-ordinators and their teaching teams. The DfL curriculum renewal project applies to all FSTE undergraduate courses and subjects and therefore, to most academic staff.

Faculties were given considerable autonomy in implementation to allow curriculum renewal under DfL to interweave with ongoing development of programs and teaching. The Faculty of Science, Technology and Engineering used a distributed strategy to lead curriculum reform with embedded teaching and learning teams composed of discipline academics working directly in teaching units. This strategy was designed to build local expertise and autonomy with the long-term aim of creating sustainable cultural change.

Curriculum reform teams in FSTE

The Faculty of Science, Technology and Engineering (FSTE) is a large, multi-disciplinary organization including 20 distinct undergraduate courses, over 330 undergraduate coursework subjects and 380 continuing academic staff. The Faculty is composed of four teaching Schools each comprising allied disciplinary departments. The Faculty operates across three locations; one metropolitan campus and two smaller regional campuses.

Similar to science faculties in American universities, academic staff in the FSTE are generally trained as research scientists with few formally trained in education (Bush et al. 2011). To provide links to teaching and learning expertise and support local delivery of the project, each of the FSTE Schools was provided with a local team consisting of a mid-career leader in learning and teaching (School Director of Learning and Teaching) and a junior science academic (Curriculum Fellow). Regional campuses were supported by local curriculum fellows who worked with relevant School Directors of Learning and Teaching and the Faculty's Associate Dean Regional who leads faculty operations on the regional campuses.

Overall responsibility for construction and delivery of the DfL in the Faculty rested with the Associate Dean Academic (ADA), a full-time position attached to the Office of the Dean (Figure 1). The ADA was responsible for implementation of the *Design for Learning* project within the Faculty and for liaison with the larger University project. The *Design for Learning* project in FSTE and the School teams were also supported by a Faculty learning and teaching team which included an academic developer, an educational designer, academic language and learning staff, a first year co-ordinator and a project manager. All members of the team linked to equivalent positions in other faculties and to central units such as the Curriculum, Teaching and Learning Centre (University academic development unit). The diverse expertise residing in the team and its external links were designed to encourage informal professional development of team members.
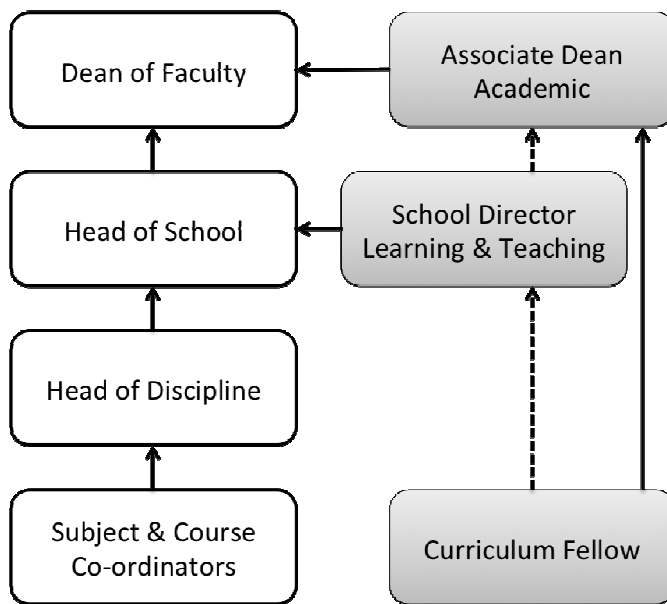
Figure 1: Reporting lines for learning and teaching leadership in the Faculty of Science, Technology and Engineering. Subject and course co-ordinators formally report (solid) through disciplines and Schools to the Executive Dean of the Faculty. School Directors and Curriculum Fellows also have informal reporting lines (dashed) for learning and teaching management.

The position of School Director of Learning and Teaching (hereinafter School Director) had appeared at La Trobe University before the advent of the DfL project. The original purpose of the role was to provide assistance to Heads of Schools in monitoring and leading governance of teaching and learning matters (Figure 1). School Directors represent their School on the Faculty Academic Committee and link the faculty, school and departmental levels ensuring that any new curriculum, teaching and learning directives or policies are widely communicated and implemented. With the initiation of broad-scale curriculum reform, the FSTE School Directors became the leading representatives of the DfL project within Schools.

The position of Curriculum Fellow was created specifically for the DfL project to provide dedicated staff to support curriculum review and redesign. In order to ensure local credibility and to build on existing relationships, the Curriculum Fellow positions were offered to appointees with current teaching experience in the relevant school. Apart from one exception in a remote campus, the positions were offered to staff who concurrently held sessional teaching appointments in their own discipline. The Curriculum Fellows did not have formal teaching training but had expressed strong interest in learning and teaching. Curriculum fellows worked closely with their School Director on day-to-day implementation of the project as the School team. They also worked on Faculty-wide resources as members of the Faculty learning and teaching team reporting directly to the ADA (Figure 1).

Responsibilities of the School teams

The embedded School teams were given responsibility for working with subject and course co-ordinators within a school or campus to map graduate capabilities onto majors and courses and to apply constructive alignment to all undergraduate subjects offered by the Faculty. Teams also reviewed the revised course and subject descriptions to ensure consistent quality in the new curriculum.

Curriculum Fellows had additional responsibility for collective construction of tools for curriculum design such as Faculty standards statements and resources for staff. This work was undertaken directly with the Faculty learning and teaching team and the Associate Dean Academic. Construction of Faculty-wide tools was done in parallel to work with discipline academics so the experience of each area informed work in the other.

School teams maintained communication with the Faculty both formally through School Director reports to the Faculty Academic Committee and informally through monthly meetings of the curriculum fellows with the ADA and the Faculty academic developer. The school teams met frequently and informally as the project progressed to discuss and plan the details of the implementation at the school level.

Aims of the study

The *Design for Learning* (DfL) Project in the FSTE demanded new consideration of the leadership of teaching and learning in the Faculty. Since the ultimate aim of the DfL was to achieve a global and sustainable shift in teaching practice towards considered and evidence-based design (La Trobe University 2009), the development of local teaching and learning leaders was thought to be critical. This study explores the effect of the project on perceptions of leadership in learning and teaching held by members of the local leadership groups and their perceptions of the operation of this distribution leadership model. The findings highlight key issues for sustainable curriculum change in science Faculties.

Methods

Data collection

Qualitative data was collected from the School Directors and the Curriculum Fellows through written submissions completed individually, followed by a facilitated group discussion for participants from each role.

Individual surveys

Identical surveys were sent to all the School Directors and the Curriculum Fellows. The surveys consisted of nine open-response questions designed to elicit data about each individual's perception of the following major themes (see Appendix 1). The questions addressed:

- The effect of the role on their own leadership skills in teaching and learning within the Faculty.
- Their perception of the effectiveness of the project and the role as a driver of change.
- Their perception of the factors that assisted, and those that hindered, the work.

- Their observation of any organizational change that may have been affected by the project.

Six responses from Curriculum Fellows (60%), and five from School Directors (83.3%) were collected anonymously via online participation.

Facilitated group discussion

Common perceptions and experiences were further explored with separate focus groups for the Curriculum Fellows and School Directors which also served to confirm/validate themes identified from individual responses. These focus groups were facilitated by a staff member external to the faculty and the project team. Each focus group comprised four attendees. Participants were asked to reflect further on:

- *Their role:* the perception of the leadership elements of their role, the effect of the appointment details on their conduct of the role (academic level, term-length) and its effect on their own professional development.
- *The project impact:* the effect of the DFL project on the learning and teaching practice of academics within their area.
- *Relationship development:* the perception of their own individual and collective sphere of influence.

Questions were open-ended and conversational, and the final question comprised an individual and collective diagram drawing task to describe sphere of influence (see Appendices 2 and 3). The focus group conversations were transcribed and de-identified by the focus group facilitator who was independent to the project.

Data analysis

A thematic analysis approach was applied to the survey comments and focus group transcripts. Consistent with the general guidelines for thematic analysis, the text was examined for frequently appearing terms and phrases which revealed common themes expressed by the participants of the study (Cousin 2009). Two researchers analysed the datasets independently and then compared and finalised the list of emergent themes.

Selected quotations are presented in the following section to illustrate major emergent themes and ideas. Quotations from responses to either instrument are identified in this paper as from Curriculum Fellows (CF) or School Directors of Learning and Teaching (DLT). Since the online survey was conducted anonymously, contributions from any one participant cannot be linked between the individual and group data sets. Contributions from any one individual within a data set are consistently identified by a unique identifier code (e.g. CFA, CFB or DLTA, DLTB for the survey responses and CF1, CF2 or DLT1, DLT2 for the focus group comments).

Results

The development of leadership amongst members of the School teaching teams was explored through both individual and joint contributions from participants. Key themes emerging from the collected data were the complementary roles of members of the teaching team, different perceptions of leadership between the School Directors and the Curriculum Fellows, the

importance of acting locally, close to discipline academics and the synergistic value of working in a team.

Relationships within the Design for Learning project in FSTE

Insights into the development of roles within the Design for Learning (DfL) project were explored through description of the relationships between participants in the DfL project. The School Directors placed themselves in a direct hierarchy between the Faculty and the disciplinary staff represented as the Schools (Figure 2). The Curriculum Fellows were identified on the right hand of the School Directors to signify they were the 'right-hand men' of the School Directors but interestingly do not have a place in the hierarchical line.

The School Directors believed they influenced university policy and procedures (signified by a question mark at the top of the diagram) through their work on the Faculty Academic Committee (FAC) and interactions with the Associate Dean Academic (ADA). They included an overlap zone between the schools and themselves to signify that they were also active teaching academics implementing the DFL principles within the subjects they were teaching. The Curriculum, Teaching and Learning Centre (the academic development unit of the University) was drawn outside the hierarchy.
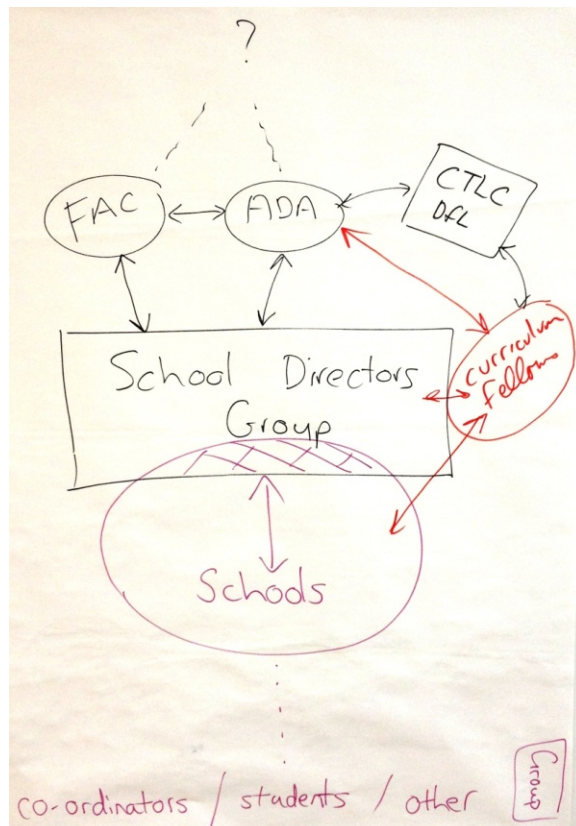

Figure 2: Sphere of influence diagram constructed by the School Directors of Learning and Teaching during the focus group discussion.

In comparison, the Curriculum Fellows placed themselves in a linear relationship between the School Directors and the Faculty. From their view, it was the Associate Dean Academic that had influence on what they called 'DfL central' (Figure 3). This is understandable since the Curriculum Fellows contributed to project planning informally through the Associate Dean Academic rather than formally through a Faculty committee. Interactions between project members were identified as bidirectional indicating that the roles influenced each other. The Curriculum Fellows felt that their influence on the coordinators was uni-directional although subsequent discussion did uncover capacity for feedback from discipline academics. Effects on students were shown to be mediated through subject coordinators within the schools. The Curriculum, Teaching and Learning Centre was shown to influence all team members, but was again depicted outside the hierarchy. Although both diagrams describe a hierarchical structure, the use of bidirectional arrows indicates a flatter structure in practice with all members of the team influencing decision-making.
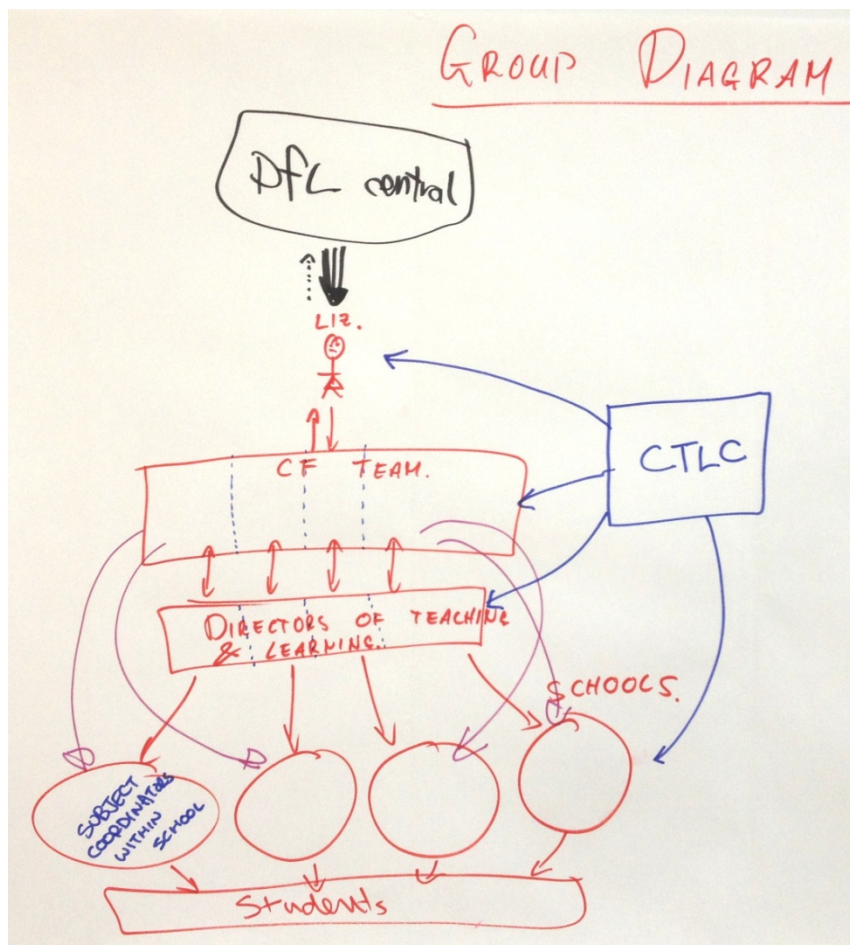

Figure 3: Sphere of influence diagram constructed by the Curriculum Fellows during the focus group discussion

Perceptions of Leadership

When asked to describe leadership and management around learning and teaching, academics are more likely to describe activities associated with management rather than leadership (Marshall et al. 2011), indicating that they may be reluctant to recognize themselves or others as being leaders of learning and teaching. In the present study, the School Directors had a clearer and more consistent conception of their role as leaders whereas the Curriculum Fellows were reluctant to describe themselves as leaders. The role of School Director is a formal leadership role which answers directly to the Head of School hence it was not surprising that the School Directors identified themselves as leaders who influenced teaching and learning policy and procedures both up and down the institutional chain. In comparison, the Curriculum Fellows viewed themselves as 'helpers' or 'advisors' for the School Directors and the individual subject coordinators that they were supporting, rather than leaders. The core responsibilities of leaders of learning and teaching involve creating a vision and direction for the institution or organizational unit and then motivating and inspiring the stakeholders to enact that vision (Marshall et al. 2011). Contrary to their perceptions, Curriculum Fellow descriptions of their role included leadership activities such as liaising with staff, interpreting the Design for Learning (DfL) vision for staff, problem solving issues as they arise and organising workshops. These activities fulfil the role of motivating and inspiring the stakeholders (subject coordinators in this case) to enact curriculum reform within their subjects and disciplines.

> *A large part of the work of a curriculum fellow is of course liaising with University staff and discussing the intentions of the Design for Learning project including teaching and assessing FGCs, recording and reporting of FGCs, cornerstone/capstone experiences, assisting staff in filling out the subject templates etc. Also, issues that have been brought up by staff will be communicated back to the project team and the Faculty. At the moment I am working on the third year subject templates, discussing capstone experiences with staff and with our project team, organising a workshop on rubrics and moderation, drafting additional resources for course coordinators* (CFD).

Research by Bolden, Petrov & Gosling (2011) found that informal leaders exerted a significant influence on teaching and learning in higher education which complemented and built on the work done by individuals in more formal leadership roles. This finding was confirmed by our data as the work of the Curriculum Fellows was recognised by the School Directors as being critical for implementation of the DFL vision within their schools.

> *DfL came along with a CF in each school to support academic staff with administration associated with reform as well as explaining, clarifying. CF did a lot of the one-to-one support. Same level of assistance would not have been possible without them* (DLTC).

> *The assistance of an extremely competent Curriculum Fellow who also performed other roles in the School was invaluable* (DLTD).

Academic credibility has been recognized as a critical element for leadership in higher education (Bolden, Petrov & Gosling 2011) and several of the School Directors used words like 'respect' and 'authority' to describe their interactions with the academics they were influencing within the schools.

> *Well there is authority involved. I found that people do respect you and as soon as you have this leadership position they come and ask you questions about their own teaching*

practise or filling out papers or whatever and I've been in the department for years and they've never done that but as soon as you get this title they see you in a slightly different role (DLT4).

The School Directors are all discipline academics, embedded in departments within the schools they represent. The formal recognition of the School Director role, along with the backing from the Head of School, were probably important contributors to the respect they received from peers. In contrast, the Curriculum Fellows were new, more junior positions created to implement DfL and, not surprisingly, were less confident in their authority over the subject coordinators (at Levels A to E) with whom they were interacting. In response to the question about what hindered them in their role, one Curriculum Fellow stated:

Knowing how much 'authority'/'respect' I had to request templates without back up of School Director of Teaching / ADA … reluctance to pressure staff re subject templates knowing of their teaching/exam marking/etc. committments (sic) (CFC).

Even if the leaders had the respect of staff they were influencing, lack of staff buy-in to the DfL process caused frustration for both School Directors and Curriculum Fellows.

There was a pervading air from staff outside the DfL team that the whole process was not respected and that where possible they would avoid the actual implementation (CFF).

I had a head of department say to me, anytime that my staff spends on this activity I regard as wasted ... So any co-operation I got from his staff I regarded as a plus, I have to say, you know, because I knew what they were up against in a sense (DLT2).

Provision of more Academic Developer support or professional development for both roles would have allowed the Curriculum Fellows and School Directors to give scholarly and compelling rationales for the changes they were attempting to facilitate and might encourage recalcitrant staff beyond "getting the paperwork done" to engaging in teaching and learning development and redesign. Marshall et al. (2011) identified a clear need for the provision of relevant, ongoing professional development for learning and teaching leaders to enable them to effectively lead and facilitate change in their organizational units. Interestingly, one of the curriculum fellows has completed a Graduate Certificate in Higher Education during their appointment.

Embedding in the discipline

A virtue of the distributed leadership model at work in FSTE was the embedded nature of the roles. The tendency for science academics to trust and be influenced by other science colleagues in teaching and learning matters rather than through direct engagement with the literature has been well documented (Burke da Silva et al. 2008, Dancy & Henderson 2008). While the embedded model is important for the credibility of the learning and teaching leaders in a science faculty there are also advantages afforded by co-location, or "walking the same halls". The importance of collegial and critical conversations, where ideas between discipline academics and academics in teaching and learning focussed roles are exchanged and a shared understanding can emerge, has been described in work by Haigh (2005) and Fraser (2006). The Curriculum Fellows and School Directors were aided in their work by having ready access to the discipline academics in their schools.

The embedded nature of the role is important and being able to make the most of 'tearoom conversations'. I think there is an opportunity for the role to also develop as a resource for teaching staff, e.g. to put them in touch with someone in another area who may be doing something that they'd like to try, suggest teaching & learning projects that might lead to publication, create awareness of SoLT (scholarship of learning and teaching) as a discipline (forward relevant papers/articles)... (CFC).

I think that in general curriculum fellows form 'a bridge' between the University/Faculty (and their goals/expectations) and the actual lecturers that have to implement them and that makes the implementation of a project like DfL much more effective (CFD).

School teams recognised the importance of being able to make the academic or educational argument to persuade discipline staff of the value of the work. This was a point made by one of the School Directors.

Support from [academic developer] was really helpful for giving us strategies and words to describe the value of DfL processes so we could convince staff (DTLC).

Teams and networks matter

Leadership in higher education is underpinned by social networks and relationships (Bolden, Petrov & Gosling 2011). The social dimension includes both formal and informal networks, internal or external to the institution, and provides the leader with support and information needed to make good decisions (Bolden, Petrov & Gosling 2011). The distributed model of leadership relies heavily on individuals working together towards the same goal (Spillane, Halverson & Diamond 2001), so the social dimension of leadership is particularly well developed in distributed leadership teams (Bolden, Petrov & Gosling 2011). When asked what helped them most in their role, both the School Directors and Curriculum Fellows recognized the importance of the people they worked with in the DfL implementation team. This finding supports the idea that the FSTE DfL team was working as a distributed model of leadership.

Support network in SD team important to me. We built strong relationships and I felt like I could call on them/count on them for feedback and bouncing ideas off (DLTC).

Working in an excellent team. Everything we achieved we did as a team and having a good understanding between all members made it much easier and more enjoyable to do the work (CFD).

Discussion

The *Design for Learning* (DfL) curriculum reform project has provided an opportunity to test leadership development for teaching in a university science faculty. The project deliberately concentrated on the development of leaders of teaching and learning from within existing faculty members. Factors important for success, as reported by team members, included a clear need for authority, academic credibility, strong relationships with local academics and a supportive team environment. Exploration of team relationships also suggests that the interplay between leadership roles was important to deliver curriculum reform. Evaluation of the outcomes of the *Design for Learning* project in the Faculty of Science, Technology and Engineering is currently underway.

The partnerships developed in the School teaching teams during this project are an interesting example of co-operation between informal and formal leadership roles with direct relationships to line managers. Relationship diagrams constructed by participants illustrate the difference between a formally acknowledged leadership role as described for the School Directors and a more tacit role, as experienced by the Curriculum Fellows. Although the School Directors did not have line management responsibility for discipline staff in their area, they did feel they were vested with authority through their relationship to Heads of School. The Curriculum Fellows were more ambivalent about leadership and described their role in more subtle terms as 'helping' or 'persuading' although they saw their role as central to implementation. In this project, it is the combination of roles that offers coherent leadership for discipline academics. The process of curriculum reform operated within a consenting hierarchical structure but relied on influence to shift underlying attitudes.

Line managers that control budget and workload set boundaries around the scope of curriculum reform while senior University and Faculty management sets institutional priorities for teaching and learning. Together, this sets the space in which curriculum reform operates (Marshall et al. 2011) and gives academics permission to participate. However, hierarchical authority and top-down instruction to innovate have not been sufficient to create sustainable change in science teaching in universities (Dancy & Henderson 2008). Attitudes to teaching and learning may be more effectively changed through collaborative and/or informal interactions (Haigh 2005). The Curriculum Fellows report that collaboration on design tasks opened conversations with discipline staff about educational principles. Encouraging general discussion about teaching and learning has been suggested as an explicit strategy for generating curriculum reform in science faculties (Anderson et al. 2011). Our experience supports this approach and suggests strategies that foster cultural change for academics should be included in curriculum reform processes.

Location of the school teaching teams close to discipline academics and appointment of team members with previous experience of teaching in the discipline were also recognized as important for the implementation of curriculum reform. Although it is difficult to isolate the effect of the background of the teaching and learning team members from other influences, it is likely that the School Directors and the Curriculum Fellows did have greater credibility because they were perceived as scientific and teaching peers. This effect has been seen in curriculum reform initiatives led by Professor Carl Wieman at the University of Colorado and University of British Columbia (Wieman, Perkins & Gilbert 2010). Participating science departments primarily used teaching reform funding to appoint science education specialists who, like the curriculum fellows in FSTE, were junior science academics with a strong interest in education. Wieman, Perkins & Gilbert (2010) report a significant increase in interest in education and voluntary curriculum revision through the activities of appointed education specialists. Bush et al. (2010) attribute this success largely to the embedded nature of the science education specialists and, in particular, to their interest and training in science education.

Translation of educational design principles into the local science teaching context needs leaders who can speak authoritatively as science academics and also as educationalists. Wieman, Perkins & Gilbert (2010) also identified a thorough knowledge of educational research as important for effective leadership of curriculum development. However, educational training is not readily observed in practice in existing discipline teaching units. Bush et al. (2011) found explicit training in educational research was limited to 32% of the educational specialists hired in science faculties in the University of California system. The authors point out that little data is generally available

on teaching-focussed appointments within science. The recent rise in similar positions in Australia (Larkins 2011) invites similar work in this system.

In this FSTE project, the emerging teaching and learning leaders were not given explicit professional development in teaching and learning but did have informal mentoring through higher education specialists. The Curriculum Fellows recognized the value of being able to put a cogent education argument which provides an avenue to shift conversations from compliance to fundamental principles. Graduates of the Graduate Certificate in Education at the University of Sydney reported a shift in underlying conceptions of teaching and learning (Ginns, Kitay & Prosser 2008) which would presumably also support leadership in this area. There have also been multiple calls for professional leadership development of teaching and learning leaders (summarized in Southwell & Morgan 2010) with the ultimate aim of improving student learning. Professional development in both leadership and higher education remains a key component in fostering curriculum reform.

This study describes an integrated leadership team which brings together the existing leadership role of School Director of Learning and Teaching with project-based Curriculum Fellow to better leverage support for curriculum reform. This combination of formal and informal leadership provides a model which has the capacity to underpin sustainable improvement in science teaching and learning in higher education. Three key elements emerged from this study to guide others embarking on program level curriculum reforms. Firstly, curriculum reform programs need specific funding to ensure that the workforce is adequately resourced. In this study, the Curriculum Fellows were new positions that played a critical role in the leadership of DfL implementation. Secondly, formal and informal leaders should be identified from within the disciplines so that they commence the curriculum reform work as respected peers with the capacity to influence others at a localized, informal level. Lastly, both the formal and informal leaders should be supported with training in leadership and management to develop their confidence and effectiveness at facilitating change. This professional development is particularly important for the informal leaders who often do not perceive themselves as working at this level.

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Appendix 1: Survey Questions for School Directors Teaching and Learning, and Curriculum Fellows

Consent for participation in the DFL evaluation survey

We are evaluating our curriculum reform programs in the Faculty of Science, Technology and Engineering. As you are a Curriculum Fellow we would be grateful if you would take the time to answer a few questions around your experience of the curriculum reform process.

It is expected that this will take around 15 minutes to complete. Your participation is purely voluntary and anonymous.

By agreeing with the following statement, you are giving permission for your responses to be used in this project as described in the participant information statement and consent form sent via email with the link to this survey.

"I have read and understood the participant information statement and consent form, and any questions I have asked have been answered to my satisfaction. I understand that even though I agree to be involved in this project, I can withdraw from the study at any time, up to four weeks following the completion of my participation in the research. Further, in withdrawing from the study, I can request that no information from my involvement be used. I agree that research data provided by me or with my permission during the project may be included in a thesis, presented at conferences and published in journals on the condition that neither my name nor any other identifying information is used."

☐　　I agree to provide responses in the following short answer survey

DfL evaluation survey questions
Please provide your candid comments and thoughts to the following questions about your role as a Curriculum Fellow in FSTE. It is expected that this will take around 15 minutes to complete.

1. Describe your role currently (eg. duties, responsibilities, activities, etc)?
2. How has your role changed over the period of the Design for Learning (DFL) implementation (2010 - 2012)?
3. What has been the major impact of DFL in your school?
4. What has been the most valuable contribution of your role in implementing DFL?
5. Describe the three most important factors that have helped you in your role.
6. Describe the three most important things that have limited or reduced your effectiveness in your role.
7. How has this role developed your confidence as a leader of teaching and learning?
8. How has this role developed your expertise as a leader of teaching and learning?
9. Any other comments you would like to make about the role?

Appendix 2: Questions for Curriculum Fellows focus group

Roles

You were appointed in this role because of your interest and expertise in learning and teaching. We would like to explore the idea of your leadership in this area.

   a) Has this position changed your perception of your capacity for leadership?
   b) In what ways did appointment at Level B indicate leadership responsibility and/or authority to you?
   c) This is fixed term appointment. Did that change your view of your role?

Impact of DfL

In the questionnaire, the School Directors described a broad impact for the DfL project whereas Curriculum Fellows saw impact at a more personal level.

   a) How has DfL changed the way the academics in your area think about learning and teaching?
   b) Do you think this change will be long-lasting?
   c) Would this change have happened without the appointment of curriculum fellows?

Relationships

Draw a diagram of your sphere of influence. Individually, then generate one for the group.

Appendix 3: Questions for School Directors, Learning and Teaching focus group

Roles

One of the School Directors mentioned leadership in their responses to the questionnaire.

a) How comfortable are you with the describing this role as a leadership role? (Facilitator to explore authority (ie. line management vs persuasion), ownership and managing up)
b) Has this position changed your perception of your capacity for leadership?
c) How do you see the role of the School Director changing after the funding for DFL stops?
d) What are the professional benefits of taking on this role?

Impact of DFL

In the questionnaire, the School Directors described a broad impact for the DFL project whereas Curriculum Fellows saw impact at a more personal level.

a) Has DfL changed the way the academics in your area think about learning and teaching?
b) Do you think this change will be long-lasting?
c) Would this change have happened without the appointment of curriculum fellows?

Relationships

Draw a diagram of your sphere of influence. Individually, then generate one for the group.