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**THE LiNKS Program
THE COMPLEXITIES OF A UNIVERSITY-SCHOOL CONNECTION.**

Paper by

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Abstract

Why does this have to be so complex? Is there no pleasing some people? Will we ever get it right? What is right? Is there only one way to do this? Why is it working in school A but not in school B? Is it preferable to try rather than not try at all? Why the detractors? Why high praise from some? Is this evidence of support? Who are the movers and shakers?

The LiNKS Program, at one campus of a large regional university in NSW, Australia, involves teacher education students being attached to a school throughout their entire teaching program. This connection enables them to be incorporated into the school culture which will, in turn, contribute to building the levels of confidence, social capital and resilience in pre-service and new scheme teachers. This program is aimed at providing an opportunity for pre-service teachers to build trust, reciprocity and understanding of one particular school environment. This paper briefly orientates the reader by describing the LiNKS Program, its goals and activities that students may engage in as active participants of the program. It then goes on to illuminate the results of a survey conducted after the program has been running for 18 months through the lens of 'complexity theory'. Identification of such complexities within the LiNKS Program leads to a consideration of the implications for learning to teach, with and by, NSW Professional Teaching Standards.

Introduction

Why does this have to be so complex? Is there no pleasing some people? Will we ever get it right? What is right? Is there only one way to do this? Why is it working in school A but not in school B? Is it preferable to try rather than not try at all? Why the detractors? Why high praise from some? Is this evidence of support? Who are the movers and shakers?

These questions are some of those resulting from analysis of the information gathered from a research project on a campus based initiative, called the LiNKS Program. The questions demonstrate that engagement in an action research project frequently offers up as many questions as it does answers which then lead to further investigation. Consequently, the educational action research methodology chosen for this longitudinal study is particularly appropriate.

What is the LiNKS Program and what is its purpose?

The conceptual underpinning of the LiNKS Program is that 'real life' experience in 'real life' schools will produce better educated and better practiced teachers. An acknowledgment that all human experience is complex and, in the case of the LiNKS Program, dependent upon a sense of reciprocity between students, university and schools being developed, nurtured and maintained, is central to the LiNKS philosophy. The LiNKS Program is additional to the series of professional experiences, compulsory aspects of the students' programs, which allow pre-service teachers to link theory to practice through stages that are sequential, cumulative and complementary. The LiNKS Program is designed to provide a context where theoretical perspectives from university courses are linked to the practical application of these theories but further it is intended to provide pre-service teachers with the opportunity to develop a deeper holistic commitment to their studies in a working school situation rather than from a reductionist view with university courses and schools as separate entities. The opportunity to develop a holistic commitment is made possible as pre-service teachers progress through their degree program, connected to a LiNKS School, where they will increasingly begin to take on the role of the teacher;; the teacher as one who is gaining professional knowledge, understanding and commitment situated in a blend of contexts between their University, LiNKS School, Practicum and Internship placements.

The LiNKS Program provides pre-service teachers with the opportunity to engage in a variety of activities and experiences within a school or early childhood centre over sixty percent, or five semesters of their study program. It is hoped that students participating in the LiNKS Program perceive that what they are learning in university classes, professional experience and as a participant of the LiNKS Program is worthwhile and that it will lead to an improved disposition and capacity to excel in the demanding career of teaching

It is further hoped that the LiNKS Program engages all partners in the spirit of reciprocity. From the student teacher point of view, they will hopefully gain a more thorough understanding of pedagogy, curriculum and assessment, bringing this experience and knowledge back to their university classes. From the school or centres' point of view, there will be reciprocal benefits by gaining appreciation of, and access to, a valuable human resource i.e. gain an understanding of our Teacher Education programs and learn from the skills students exhibit that they have developed as participants in our university programs. It is hopeful that this will enable building the students' and the practising teachers' social capital in the context of working schools. 'Social capital'(Bourdieu, 1985), involves individuals developing confidence in others' reliability and integrity resulting in a sense of trustworthiness. '[A] group whose members manifest trustworthiness and place extensive trust in

one another will be able to accomplish much more than a comparable group lacking trustworthiness and trust' (Coleman, 1990, p.304 cited in Fishler & Firestone, 2006, p.1158). Trust enables deeper questions of teaching practice to be explored. Woloshyn, Chalmers and Bosacki, (2005) argued that skills of building of rapport, establishing compatible goals, negotiating tasks and sustaining a sense of commitment and satisfaction from the collaborative process enabled the developments of social capital. The LiNKS Program has at its very core these same concepts of building rapport, establishing compatible goals, negotiating tasks and sustaining a sense of commitment and satisfaction for all parties involved in the connection. These criteria, as well as the opportunity to engage in reflection and critique, all crucial elements in the building of 'social capital', and well supported as desirable in relevant literature, augur well for the goals of the LiNKS Program. The LiNKS Program has the added advantage of complementing the development of the NSW Institute of Teachers Professional Standards (2004) and the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) national goals, particularly the commitment to collaboration via the opportunity to 'further strengthen [ing] schools as learning communities where teachers, students and their families work in partnership with business, industry and the wider community' (1999).

How does the LiNKS Program work?

Nine hundred and fourteen (914) pre-service teachers, from one campus of a large regional university in NSW, Australia, are involved in the LiNKS Program. Two hundred and fifty eight (258) schools and centres participate in the program. (105 Early Childhood Centres, 11 Central Schools, 14 Primary Catholic Schools, 110 Primary Government Schools, 3 Secondary Catholic Schools, 15 Secondary Government Schools). Each student has a professional relationship with the staff and is assigned to one school or early childhood centre, rather than to an individual mentoring teacher for the majority of their program (five semesters) with the aim of developing a collegial liaison. Pre-service teachers give of their time as a reciprocal gesture (10m hours minimum) to assist in school or early childhood settings in tasks of the school or centre's choosing. In return the school or early childhood centre provides informal mentoring and the opportunity for the student to complete course assignment tasks. Visits and activities are negotiated between the preservice (PST) and the school with guidance provided by academics and LiNKS support documents. A list of suggested activities is provided to both the student and the school. The reciprocal hours are recorded in a journal and signed off by the supervisory teacher at the school or centre after every visit. The LiNKS Journal has become an important document for future employment interviews, together with the Certificate of Reciprocal Service awarded to the student at the end of the LiNKS experience.

Activities LiNKS Students are likely to be involved in.

- Engaging with classroom activities
- Observing lessons in all stages/years
- Working with small groups of children, within view of teachers (e.g. reading groups)
- Shadowing teachers on playground duty
- Assisting with arrival & departure (transport) duty
- Helping with sports teams and events, as a volunteer
- Attending & helping at sports carnivals & cross country events and themed activity days
- Attending school assemblies –speaking at assemblies to give announcements

- Attending staff meetings
- Shadowing teachers as student management procedures are put in place e.g. time out room
- Meet & chat with the Principal, Deputy Principal & Assistant Principal or early childhood Director about the roles & responsibilities of the executive (e.g. at morning tea or lunch time)
- Sitting in on parent-teacher interviews
- Attending excursions as a volunteer helper
- Taking lunchtime activity groups as a volunteer helper e.g.. guitar group, choir, sports teams, clubs, assisting teachers
- Assisting in school musicals/extravaganzas
- Organising class based assembly items
- Organising take home readers/library borrowings
- Spending time helping in the school or centre's administrative office.
- Reading to a small group of children
- Engaging in play and sport sessions

Methodology

The methodology selected is based upon an educational action research approach where the co-researchers continue to evaluate the progress of and make changes to their interventions as part of a systematic cyclical approach to improving teacher education programs. Action research has been used since late 1940s and early 1950s and its purpose in schools has primarily been to improve and change teaching practice, support school reform and promote professional development. Action research requires the researcher to reflect on their own practice by systematically gathering information and then using the insight and data gained to develop ways to improve their practice. Action research uses dialogue with teachers or students, reflection, both individual and collective, observation and analysis to plan, implement and then evaluate cyclically. Assumptions of this approach include the emergent and cyclical nature of action research, the value of collaboration and reflective critique and the potential of action research to create change underpin the success of this process (Christenson, M., Slutsky, R., Bendau, S., Covert, J., Dyer, J., Risko, G. & Johnston, M. (2002).

This longitudinal study has the potential to pinpoint issues that can enhance or inhibit the collaboration of school/academic partnerships and larger scale action research projects in schools and has the potential lead to further exploratory projects. The longitudinal nature of the study can provide useful descriptive material about the professional development of teachers as they embark on their professional careers and may inform future studies on the progression of these students into their early years of teaching. Participation in the research by varied groups of people involved in teacher education will enhance the likelihood of future professional partnerships.

Particular limitations exist in choosing a longitudinal study with a variety of data collection instruments. Focus groups render the researcher with less control compared to individual interviews as participants are able to interact and therefore influence each other and the path of the discussion. This may result in the focus of the discussion meandering along and touching on irrelevant issues, so the interviewer's role is to keep the discussion on track. The data collected must be analysed within the context of the focus group and in sequence so that premature conclusions are not made. An interviewer experienced in focus group interviewing is likely to gather more dependable results for analysis and the knowledge that as no two focus groups are the same, the research plan should

cater to having a number of focus group interviews over the length of the project so that a balance in information will occur (Krueger, 1994). Survey research presents particular limitations although it is a convenient and viable option. There is the potential for informants to offer socially acceptable responses as opposed to articulating what they actually do and why this can make questionable the accuracy of the information offered. The survey questions must be clear and unambiguous, not too lengthy yet have sufficient items to provide reliability, while there is the additional risk of a minimal response rate. (Oppenheim, 1992)

Data sources

As a longitudinal, campus based initiative, this research project is intended to provide cyclical, participative, qualitative and reflective evidence that will continue to emerge as the researchers track selected students over their four year program and into their teaching career. The research project (in totality) will draw on five strands of data gathered via students' LiNKS Journal; early surveys sent to schools & students, interviews; anecdotal evidence and focus groups.

Students have LiNKS journals, in which students record all the activities they participate in, the hours they attend and any comments that they and the teachers have made are maintained. These recorded activities are to be signed by the teacher as verification of the student's activities. These activities are monitored by the researchers to ascertain the types of activities they are generally involved in and whether these activities change over time or from school to school or centre to centre.

Surveys are sent to schools and to students every year to determine how the students' services were utilised, what the problems were, how the program can be enhanced and what, if anything, they gained from the program. The surveys are loosely linked to the NSW Institute of Teachers Professional Standards and so the researchers can gain insight into how the students and teachers perceive their progress to attainment of the professional standards and how this progress is related to the LiNKS program.

In addition, teachers and students are asked if they would agree to be interviewed about their LiNKS experiences and if they are willing to show some of the material they worked on during their LiNKS visits. Researchers monitor changes over time in attainment of program objectives and clarify with students their own understandings of how they are learning. Data is also provided anecdotally as the Professional Experience staff talk to teachers and students about their LiNKS placements and any problems arising or positive benefits emerging. Academic staff also engage in conversations with LiNKS teachers and students, which enables them to gauge the interest levels, note the positives and troubleshoot any difficulties.

Three recent focus group encounters with discussion based upon the LiNKS Program and some aspects of the NSW Institute of Teachers Professional Teaching Standards has just been completed. Aspects of The NSW Institute of Teachers Professional Standards Elements Two, Three, and Four were examined in light of the experiences students undertake in LiNKS Schools. The ideas they were developing about what makes a professional teacher were compared to some of the elements of the NSW Institute of Teachers Professional Teaching Standards with the view that this study can provide some significant snapshots of how teachers develop when they have such broad enculturation experiences.

Complexity Theory to examine the value of the LiNKS Program

Although the LiNKS Program will be examined from a number of perspectives over time, the lens of 'complexity theory' is used in this instance. Complexity theory is a field of study involved in analysing complex systems with the aim of understanding their structure and behaviour. Ferreira, who has traced the origins of complexity theory, pointed out that 'a complex system is characterized by emergent behaviour resulting from the interaction among its parts and, for that reason it cannot be fragmented without losing its identity and purposefulness' (Ferreira, 2001, p.1). According to Ferreira, it has 'a large scope of application in today's life mainly because real world systems are all complex'. Researchers working in the field of complexity theory come primarily from mathematics, physics, computer science and biology but the work of Stadler and Bonabeau (1998) has moved the theory into the social sciences.

Complexity theory is defined as an explanatory approach for organisations that takes into consideration the non-linearity and evolutionary nature of the environment and the inter-relationships of the individuals involved in that connection. As such it has direct relevance to the LiNKS Program. Such a complex system such as LiNKS has a large degree of self organisation, has the potential for embryonic developments and is often far from being in equilibrium. Examining the LiNKS Program from the perspective of complexity theory involves investigating how the individuals and organisations interact, relate and evolve within a larger social ecosystem - 'complexity arises through connectivity and the inter-relationships of a system's constituent elements [the people involved]' (Mitleton-Kelly, 2001, p.25). The LiNKS Program will be examined with respect to how it accommodates the following aspects of complexity theory – the non-linearity of its management, its multiple inter-relationships, its potential for self-organisation, its evolutionary nature and its constant state of disequilibrium, and how it fosters embryonic developments.

- **The LiNKS Program is a non-linear program in regard to its management with the players having multiple layers of accountability and responsibility.**

The structure of the LiNKS Program is far removed from a linear model. Many levels of inter-relationships exist and negotiations must take place to establish roles and responsibilities at every level. For example there are the people with whom a typical pre-service student teacher will interact with in schools/centres. On top of that there are the relationships at the university made even more difficult when a program like this stands outside the normal professional experience channels. Because the LiNKS Program is not simply defined by professional standards or outcomes statements already defined in course programs and is a negotiated relationship it has the potential to have many more levels of negotiation within these relationships than the usual practice teaching experience. In reality these relationships are recursive with an ebb and flow of interactions occurring between each of the individuals and groups involved. The complexity is evident.

↔	↔	↔	↔	↔	
Pre-service student teacher connected to a LiNKS School/Early Childhood centre.	Principal/ Director	Executive staff/ variety of positions	Deputy Principal/s	Grade Coordinators	
			Assistant Principal/s	Committee Chairs	
			Assistant Director	Sport coordinators Etc	
	Teachers	Grade groups/ EC room groups	Individual teachers		
	School Counsellors				
	Consultants	In each Key Learning Area			
		Outside agencies e.g. DOCS			
	School/pre-school students	Kinder- Year 6/ 0-5 years	Single classes	Small groups→ Individual children	
	Parents/Carers				
	Support/ Ancillary staff	Ancillary support e.g.	Groundstaff		
			Canteen staff		
			Front office		
			Print room		
			Library		
			Labs		
Teachers Aid e.g.		Vision			
		Hearing			
		Behaviour disorder			
		Physical disability support			
University LiNKS Program Co-coordinator	University Deputy Head of School of Education	Course Co-coordinators	Lecturers & Tutors		
	Program Convenors				
	LiNKS Administrative Assistant				

Table 1. Indicates, as an example, the complex nature of the relationships required by the pre-service teacher with an ebb and flow of interactions occurring between each of the individuals and groups involved. The complexity is evident.

Complexity theory also helps to explain why interventions may have unanticipated consequences. It is impossible to foresee all potential changes and therefore take all issues into account at the planning stage. As such, recognition by all people involved that small change can produce quite significant and unpredictable qualitative changes is important. Change is to be expected and can result in a state somewhere between stability and instability, which according to Gleick, (1990, as cited in Mitleton-Kelly, 2001) and Parker & Stacey, (1990 as cited in Mitleton-Kelly, 2001), is a 'state of creativity and innovation'. The researchers welcome creativity and innovation in the evolution of the LiNKS Program.

- **Multiple inter-relationships**

Equality in the LiNKS Program is not an essential element and as such it is not a partnership, rather it is best viewed as a connection. What is essential however is that each participant in the connection understands that they have a valuable role to play in such a complex program. The LiNKS Program co-coordinator is constantly responding to new issues regarding the LiNKS Program. The need for communication, in an era when communicating with schools is so difficult, is a constant challenge to the LiNKS Program. At times students are also difficult to communicate with and there is a need for good relationships to be built and nurtured between them, schools and university staff. Working on good communication and relationship building is one of our main focuses. As teaching is a profession built on relationships, with a great deal of reciprocity required, participation in the LiNKS Program provides a good modeling process for our students, with the acknowledgement that at times it will be somewhat frustrating and time consuming and for all involved.

Soliman (2001) suggests reciprocity can be viewed as a condition where each party recognises and appreciates the other for the value they have to offer the connection. When designing the LiNKS Program, the researchers were cognizant of the fact that our students are a valuable commodity in the field of education but as yet are not always recognised as such. Potter (1999) cited in Peters, (2002) provides a definition of reciprocity as it applies to practising teachers in a professional development context, however it is useful in defining the sense of reciprocity and value that not only the LiNKS schools have to offer our students but that our students have to offer their LiNKS school in return:

Reciprocity represents an attempt to establish a social relationship that expresses and symbolizes an interdependence and complementarity. The concept is important to the collaborative research process where the school-based researchers on the one hand and the university-based researcher on the other, both teach and learn from one another. (p.61)

- **Self-organisation**

The LiNKS Program will have movers and shakers, doers and viewers all prepared to provide differing levels of support or otherwise. The movers, shakers and doers in the LiNKS Program are the University Academics involved in the project, the Pro Vice Chancellor, the Head of School, the Deputy Head of School at the campus in question, the Administrative Support staff member, the local Principal's Council, the local Department of Education and Training Director (DET), local DET schools, local Catholic Schools and Independent Schools, Principals, Directors, Teachers and Early Childhood Centre Directors, Teachers, Proprietors and University Students. Holland and Miller (1991), suggest that complex systems tend to exhibit 'self-organizing' behaviour with the participants co-evolving with one another and consequently adapting to their environment,

especially if a benefit is perceived. Kauffman (1993, cited in Anderson, 1999, p.219) further asserts that such programs may commence in an uncertain state yet over time they usually evolve toward order instead of disorder. Fontana and Ballati (1999) claim that self-organisation, or 'autogenesis' is the natural result of nonlinear interaction and so the movers, shakers and doers are those most responsible for self organisation of the LiNKS Program.

The LiNKS Program will have detractors. This is to be expected and is no reason to not continue the process of evolution if it is perceived to have value. The detractors are termed the 'least-fit element' by Bak (cited in Anderson, 1999, p.224) and he suggests that the least fit member is usually replaced in the same way that 'the least effective firms in an industry tend to go bankrupt and be replaced by new entrants'. In the context of the LiNKS Program, what has happened is the insertion of increased energy to promote the fact that a benefit is possible by participation in the program. For instance if the connection between the LiNKS Program and the NSW Institute of Teachers Professional Teaching Standards can be made then this could be the injection of evidence needed to convince detractors that the program does have personal benefits for them.

- **Evolutionary nature and constant state of disequilibrium**

The movers, shakers and doers proceed with change, highlight problems and work at solutions. The viewers will sit back and take it all in; some will be drawn onto the doer's team and as such usually exert a very positive influence on others [other viewers and detractors] and the program, once a decision to offer support has been made. Drazin & Sandelands (1992, cited in Anderson, 1999, p.219) research found that:

when the interactions of large numbers of components involve positive feedback loops, some behaviors self amplify, quickly crowding out others. Groups of components become locked into self-reinforcing feedback cycles that lead to predictable collective behaviour.

The data suggests that the LiNKS Program, since its inception, is becoming more predictable, accepted and valued as time passes as the following examples of survey excerpts suggest. Seventy four (74%) of school informants perceived the LiNKS program to have value with two typical responses being:

It's a great idea and experience for aspiring teachers to become immersed in the school environment, and get a real feel for what the teaching and learning environment is like. Such regular exposure may aid the student teacher in deciding their future in the early stages (if there's any doubt!!).It also allows them to develop certain skills and observe the degrees of professional that is required in the teaching profession. Assistant Principal #115

LiNKS can be wonderful- if the LiNKS students want to become involved and want to learn. My two are part of my school community and the [primary school students] view them as real cool teachers. Visit regularly, join in, kids love them. A big help in a one teacher school. Will try anything to learn new skills. LiNKS students are invaluable. Principal #153

However, not everyone loves it. The question '*Did you find the LiNKS Student a valuable asset to your school/centre?*' and '*Did you find your LiNKS experience valuable?*' asked of schools, centres and pre-service teachers had a negative response rate of fifteen percent (15%) with typical comments listed below:

'Students weren't around long enough to be of any value' Classroom Teacher #30
 'No-she was only here to help her course requirements' Assistant Principal # 18
 'No-some of the LiNKS students come and do not act motivated or keen at all. It's a bit disappointing' Classroom Teacher #46
 'No' Head Teacher #53
 'Not so much for us as for them' Principal # 96
 'Depends on the initiative and motivation of the student. Some seem to think it is a task and don't value the experience' Deputy Principal #109
 'Of no value to the class teacher, only sat and observed' Classroom Teacher # 133
 'Not really, they just observed, not much interaction with students, if any' Classroom Teacher #142
 'Not really, she only observed' #151
 'This year 2 short visits, not effective for anyone' #178

So, is there no pleasing some people? Complexity theory suggests that there will always be detractors in any connection. The LiNKS Program will evolve and progress regardless of the detractors in a self sustaining fashion if the program is seen to have value. The LiNKS Program is considered valuable by 74% of schools surveyed with 3% considering it had both valuable and not valuable aspects and 16% considering that their experience, so far, had not proven to be valuable to them. In 12% of the not valuable responses the school could see value for the students but not for the school. In the early childhood sector 60% of respondents indicated that the LiNKS Program had a valuable role to play with 30% indicating the opposite. In the pre-service student data 76% found value in the program with 5% indicating that it was of no value. Schools, early childhood sectors and pre-service teachers' data combined indicated that 73% valued the LiNKS Program and 15% didn't.

These results indicate that overall the majority of informants considered that the LiNKS Program does hold value and, as expected, not all respondents will be pleased all the time. This is a positive sign in that there is some recognition of the inherent value in the LiNKS Program but it is also an indication that an injection of energy, in the area of supporting detractors to consider the potential of the LiNKS Program and to assist the teachers to gain professional standards or 'a payoff', is needed.

The following informants' comments are offered as typical, indicating the perceived value of the LiNKS Program however the researchers feel that further research is warranted to explore the different understandings and interpretations of the term 'value':

'I love LiNKS ' Pre-service teacher #F11
 'Overall I like LiNKS and want to help get it better established' Pre-service teacher #F15
 'More emphasis [is needed] on LiNKS Program. Pre-service teacher #51
 'LiNKS school- fantastic resource for making connections between theory and practical' Pre-service teacher #52
 'It is a very supportive program' Pre-service teacher #10
 'The LiNKS Program is very useful in communicating with teachers, parents and students as well as observing teaching practices' Pre-service teacher #60
 'I think the LiNKS Program is a fantastic idea. We were really impressed with most of the students allocated to our schools' and 'the LiNKS student had a great deal of common sense and professionalism' Deputy Principal #90

‘An additional adult is always welcome in my activities in a small school’ Classroom Teacher #96

‘Yes, [its valuable], she was able to take small groups and work with them, especially in reading.’ Classroom Teachers 1.# 18

‘Helped prepare and run musical item. Great help over 5 months’ Classroom Teacher 3 # 18

‘Always able and flexible to help with whatever is happening in the classrooms’ Assistant Principal; #30

‘Yes their assistance was valuable as they helped with reading groups, maths activities and giving spelling and maths test to small groups of pupils. Also supervising writing tasks, e.g. narratives and recounts’ Classroom Teacher #33

‘Yes, [its valuable], she’s extremely helpful and organised’ Director #167

‘I find it informative to see what the students are learning and how it is being presented’ Director/Teacher #194

‘Found helpful when they had an assignment to review a centre policy! This was appreciated. Two way benefit. Always nice to have an interested student on hand to assist’ Director/Teacher #229

The following comments, while not explicitly suggesting value, do indicate support for the program coupled with suggestions for improvements.

‘Not enough [LiNKs] for beginning teachers’ Pre-service teacher #F1

‘Can LiNKs be put on a timetable i.e. a day for LiNKs [each week]’ Pre-service teacher #F10; ‘Maybe in groups of days –not every week’ Pre-service teacher #F10;

‘Maybe multiple LiNKs so [we] can decide whether to teach primary or secondary’ and ‘need to know how a school is run’ #F14;.

- **Fosters embryonic developments**

One of the valuable aspects of the LiNKs Program is the number of small scale research and teaching experiences that it has fostered. Academic staff design course based assessment tasks that directly link to experiences in schools necessitating negotiation with pre-service teachers, individual teachers and schools. As a result there has been more collaboration around what constitutes appropriate assessment in a teacher education institution. From the first year of their undergraduate degree, pre-service teachers observe and experience episodes in schools which prompt conversations with their lecturers in a wide variety of courses - not just the typical professional experience courses. This enables a constant reference back to the linking between theory and practice throughout the four years of the program. Academic staff reflect upon ways the LiNKs Program can assist in school of education research efforts especially with regard to action-based research and has resulted in a number of initiatives. This embryonic development of more intensive action-based reflective practice is what we intend in our programs.

- **So does complexity theory shed light on the operation of our LiNKs Program?**

The surveys and anecdotal responses reinforce the notion that the LiNKs Program is dynamic and therefore constantly evolving and changing but also then leads to the question: So why the detractors? It is best responded to through a complexity theoretical lens with a challenge: Why not? It is to be expected that in any connection there will be detractors. A new and evolving connection will automatically shift the boundaries of one’s comfort zone and this immediately sets up personal and social challenges. Personal and social challenges Holland & Miller (1991, p.365) claim, when

viewed through the lens of complexity theory, can be addressed when each participant adapts to the challenges of the environment by focusing on ways to increase and improve energy in the areas of 'performance, utility, payoff or fitness value over time'. So in order to maintain the LiNKS Program, which like any connection is fallible to dissipation, members must be induced to contribute energy to the program (Barnard 1938 in Anderson, 1999, p.222). They will ultimately find a way of working within the system or perhaps outside the system, that suits them.

It can also be the case that the behaviour of complex processes can be quite sensitive to small differences in initial conditions, so that two entities with very similar initial states can follow radically divergent paths over time - and so will we ever get it right? What is right? Is there only one way to do this or one right way? Why is it working in School A but not School B? As an example of the diversity of attitude in school and early childhood centre contexts the following responses are offered as scenarios.

Scenario School A- 300 Primary school students - classroom teacher perspective.

[Is the program valuable?]

Yes- they are willing to learn, keen, flexible, try new ideas e.g. interactive whiteboard, using techniques they have been introduced to e.g. Records of Reading, grouping students, observing classroom teachers dealing with behavioural issues- this will make them a more confident/competent teacher and someone valuable to any school staff. The school students love it [when the LiNKS student attends]. We consider only the benefits from helping future teachers ...some schools are not as welcoming as we had a student who changed to a school [us] who were willing LiNKS participants and valued the student as a future classroom teacher. Classroom teachers need to form strong collegial bonds which allow communication, sharing of resources, ideas, observation of quality teaching- all this establishes more skill and confidence when the students attend practicum. #147

Scenario School B-400 Primary school students-classroom teacher perspective.

[Is the program valuable?]

No, they just observed and asked questions. [I want to know] what students should be doing. I didn't know the LiNKS student was arriving and so she was given to me with no prior notice. Fitting in with times to come within the uni timetable and school timetable [is difficult]. [It is] important to make sure the student contacts the school and knows what class and the name of the teacher.# 105

Scenario Early Childhood Centre A- director perspective

[Is the program valuable?]

Found helpful when they had an assignment to review a centre policy. This was appreciated. Two way benefit. Always nice to have an interested student on hand to assist. # 42

Scenario Early Childhood Centre A- director/teacher perspective

[Is the program valuable?]

No. I found this to be an imposition on my staff and my time. #175

According to complexity theory there is not one right way, or only one way to do things. The LiNKS Program is a constantly evolving connection that is non-linear and therefore very complex. Different attitudes to the program by the staff at schools/centres and the LiNKS Program pre-

service teacher education students are evident and expected. What is right in one instance in one period of time will most likely NOT be right in either the same context at a different period of time or in an altered context. To borrow Anderson's words (1999, p.217), 'the behavior of complex processes can be quite sensitive to small differences in initial conditions, so that two entities with very similar initial states can follow radically divergent paths over time'. The non-linear nature of the LiNKS Program means that myriad people are involved in the functioning and management of the program and self-organization, or 'autogenesis', is the natural result of such nonlinear interaction (Fontana & Ballati 1999). It is for this reason that if LINKS is not successful in one context that is not an indication that it will always be unsuccessful in that or other contexts, each different context will self-organise to fit within the evolving constraints of the LiNKS program. Often it simply takes a change in attitude by a teaching staff member or pre-service student teacher or a replacement in staff to turn an unsatisfying experience into a positive one. So in answer to the question: Is it preferable to try rather than not try at all? Absolutely yes, it is preferable to keep trying and adapting as the model is not static but constantly evolving. Change is the rule not the exception.

Why high praise from some? Is this evidence of support? The high praise and sense of value as interpreted by 73% of schools, centres and students, is evidence of support and provides myriad future research opportunities, however the LiNKS program is a dynamic, evolving entity and as such there can be no 'resting on laurels', as 15% of respondents don't see value in the program. Our intention is to work with the movers and shakers, (the Pro Vice Chancellor, the Head of School, the Deputy Head of School, the Administrative Support Staff Member, the local Principal's Council, the local Department of Education and Training Director, local Catholic Schools and Independent Schools, Principals, Directors, Teachers, General School & Early Childhood Centre Staff , University Students and Academics) to take note of their positives, successes, issues and ideas, invite them to share their successes and solutions, to instigate small change in other contexts, respond to suggestions in a positive light, provide more structure when requested and continue to conduct research so that our future directions can be determined by the participants in the program. The alignment of our LiNKS program to the NSW Professional Teaching Standards is one way to gauge the issues.

The LiNKS Program and NSW Professional Teaching Standards

The LiNKS Program has very strong connections to Elements 6 & 7 of the NSW Professional Teaching Standards (Appendix 1). All sub elements have the capacity to be enhanced by the LiNKS Program for both pre-service and practising teachers. These elements refer to the need for teachers to continually improve their professional knowledge and practice and that they should be actively engaged members of their profession and the wider community. Additionally a focus group discussion was held to ascertain how the different elements of the LiNKS Program contributed to student knowledge in some aspects of Elements Two (teachers know their students and how they learn) Three (teachers plan, assess and report for effective learning) and Four (teachers communicate effectively with their students) This was an indirect method of ascertaining whether LiNKS filled any 'holes' in student understandings or whether LiNKS was only 'icing on the top' of the teacher education degree programs. In an era of ever tighter budgetary restraint in teacher education all such programs, no matter how valid professionally, must justify themselves in terms of accreditation necessities. The connections between the LiNKS Program and these Elements

appeared to be supportive of the LiNKS Program in providing capacity and opportunity to further enhance pre-service teachers' achievement of a number of the elements from the NSW Professional Teaching Standards.

The focus group study confirmed that pre-service teachers felt that they were developing knowledge of the **physical, social and intellectual developmental characteristics of the age group(s) of students (2.1.2)**: *'LiNKS provided an affirmation of what they [students] are like.'* They were able to work on establishing compatible goals between what was happening at university and what they saw in classrooms and were beginning to create an awareness of a sense of commitment and satisfaction from the collaborative process that the LiNKS Program offered.

The pre-service teachers were able to view **students' varied approaches to learning (2.1.3)** and felt confident in what they had learnt at university. *'[I/we] felt pretty confident that we know about different learning styles but there was not enough prac to see how it worked. LiNKS helped here.'* The LiNKS Program provided them with an additional opportunity to see the theory translated into in practice.

The pre-service teachers' **knowledge of how students' skills, interests and prior achievements affect learning (2.1.4)... pushed them beyond their zones of comfort which resulted in self critique and reflection** *'Going to [LiNKS] schools got us out of our comfort zones and we were challenged.'* and *'We get confronted by our own prejudices in LiNKS, e.g. don't like swearing or don't like the way kids dress. We need to deal with ourselves a lot when we are in our LiNKS School observing all this'.*

Planning teaching and learning goals (3.1.1) was an area students felt confident in as a result of their university preparation (see Appendix 2: 3.1.1) but it was in their LiNKS Schools that they saw it in practice. *'In schools through LiNKS we saw teachers put it together.'*

Providing feedback to [school] students, (3.1.7) was considered an important aspect of the teaching and learning process yet comments such as *'We've not seen a lot of it in our LiNKS classrooms as we watch. It must be something teachers do at home.'* and *'[Assessment] is really important in teaching.'* prompted reflection and critique.

The pre-service teachers found **effective communication and classroom discussion, (4.1.1)** with staff in schools and centres difficult which tends to indicate that the more time they spend in their LiNKS School, the easier this should become. It also points to the need to inject energy in communicating with schools on how important it is to make the students feel welcome. *'You are on your own trying to communicate what you were doing and how you could contribute to the school.'* and *'Hard to go into staff room and talk to staff members, they tended to ignore you if you didn't speak up.'*

As students were asked about aspect **4.1.5 Teaching strategies** they took the opportunity to comment on the difference between the rhetoric and the practice *'Not a lot of variety of strategies seen in school.'* and *'Information and Computer Technology was a cop out- schools said they were doing it but they didn't.'*

It appears from the focus group data that the collaborative process of the LiNKS Program was welcomed and provided an avenue of satisfaction. Most crucially this analysis has identified the LiNKS Program as an opportunity for students to reflect on and critique practice, their own and those of teachers they were observing and working with and the schools they were working in. Critical reflection is a vital skill that is developed over the course of a degree program and the

LiNKS Program is providing the opportunity for reflection in action, for later action by the students (Grushka, Hinde-McLeod and Reynolds, 2005). It is expected that it also provides the same opportunity for teachers and schools/centres to reflect on and critique the LiNKS Program, the pre-service teachers, the university administrative processes, academic staff and the degree programs. This provision of opportunity to reflect on practice is essential for the continued successful evolution of the LiNKS Program and is welcomed. It is evident that the LiNKS Program has the capacity to enable, not only our , but also practising teachers as they engage in the program, the opportunity to work towards achievement of a number of the elements from the NSW Professional Teaching Standards.

However, as Radford (2007) reminds us, complexity theory helps us understand that learning to teach is a complex process - not just a complicated process - and as such outcomes can not be easily anticipated or managed. Radford compares the creative process of the artist to the teaching situation and argues that, due to the unpredictability of the teaching process, focusing on established goals (or in this case Professional Standards) may not be achieved due to the multitude of incidental events along the way. To take just one example from our focus group study; the students uniformly noted that ICT was not a strength in any classrooms or schools that they attended despite the rhetoric to the contrary from school authorities. The effect of not seeing accomplished ICT practice however, can have a dual effect. It could limit the ability of pre-service students to use ICT or alternatively it could lead pre-service teachers to seek this out for themselves and to try to change this state of affairs. In reality it will probably have both effects and so we will never uniformly produce pre-service teachers all possessing the same skills and attitudes. Additionally with regard to the ICT example, listening to the students reinforced the necessity for us to continue to fight for better ICT structures in our programs so at least we can model good practice. What initially appears to be a problem can actually lead to very positive outcomes and if we go back to Radford's analogy of teaching being like an artist producing a work of art, in some ways we, as tertiary educators, can stand back and critique, offering suggestions and guidance but in reality acknowledging that we have limited control of where it will all lead. However, crucially, we must also give the artist the skills to critique his or her own work because in a complex world there will be no clear linear answers to all the questions.

Why does this have to be so complex? Is there no pleasing some people? Will we ever get it right? What is right? Is there only one way to do this or multiple versions of one right way? The difficulty is in making the connection between what is taught in university and what happens in schools. By regularly participating in, and observing educational practice and having conversations about those everyday events in schools and classrooms, pre-service teachers may be better prepared to be quality teachers. Building the connections between the NSW Institute of Teachers standards and what pre-service teachers see in classes, when and how they use the particular elements of the NSW Institute of Teachers standards and how they should respond is hopefully provided by the LiNKS Program. So as pre-service teachers become connected to a school over an extended period of time, experience a variety of events at that school, watch over time how teachers reflect in action, on action and reflect for action, become social participants of the school, begin to trust, understand and develop a sense of reciprocity with colleagues they may be better able to add to their teaching tool kit and gain confidence, educational social capital and resilience in order to better reflect and act in their role as pre-service and new scheme teachers.

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