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Mentoring: A rich source of information to network and align student and teacher needs

Abstract

Alignment of teachers' and learners' purposes in the learning context is a complex process and a development of mutually beneficial relationships is critical to the interface of teaching and learning. Mentoring provides a means of creating this interface by facilitating a network of learning relationships. The purpose of this article is to report on the mentoring process that was developed in an Evaluations and Investigations Program (EIP) (Gluck and Draisma 1997). It focuses on experience gained in facilitating student mastery in the fields of Physics for Nurses and Acute Care Nursing.

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Russell Gluck
Kim Draisma

Introduction

Alignment of teachers' and learners' purposes in the learning context is a complex process and a development of mutually beneficial relationships is critical to the interface of teaching and learning. Mentoring provides a means of creating this interface by facilitating a network of learning relationships. The purpose of this article is to report on the mentoring process that was developed in an Evaluations and Investigations Program (EIP) (Gluck and Draisma 1997). It focuses on experience gained in facilitating student mastery in the fields of Physics for Nurses and Acute Care Nursing.

Background

The Aboriginal Education Centre (AEC) was funded under the EIP to investigate infrastructure necessary to educate Aboriginal professionals for community, professional and industrial organisations in the Illawarra and surrounding regions. Among other disciplines, the EIP report reflected on experiences of facilitating Nursing students' mastery of Physics and Acute Care Nursing. The EIP report argued that learning environments which met the needs of Aboriginal students provided a direct window to a range of mainstream teaching and learning issues. Thus the techniques developed in this project are able to be adopted easily into all teaching and learning activities. Mentoring was a key process in facilitating networks in which learning relationships could develop to promote student success and teacher effectiveness. It is these foci that are addressed here.

Mentoring: Theory and practice

Mentoring focussed on aligning student need with teaching practice. The mentoring process was underpinned by the theoretical framework of Vygotsky's zone of proximal development (ZPD) (see Vygotsky 1978; Gallimore and Tharp 1990) and implemented through the practice of mentoring as described by Argyris, Putnam and McLain Smith (1985). The ZPD is defined as:

... the distance between the actual developmental level [of a learner] as determined by independent problem solving and the level of potential development as determined through problem solving ... in collaboration with more capable peers (Vygotsky 1978, p. 86).

Gallimore and Tharp describe moving through the ZPD as a gradual process, where the learner moves from assisted performance to

unassisted and self-regulated performance:

- Stage I: where performance is assisted by more capable others;
- Stage II: where performance is assisted by the self . . . [but where] performance is [not] fully developed [n]or [automatic];
- Stage III: where performance is developed, [automatic]; and fossilized; and
- Stage IV: where [new learning situations lead] to recursion through the zone of proximal development (Gallimore and Tharp, 1990).

The mentoring role may be carried out by a range of individuals: for Vygotsky this could be a 'peer or more capable other' (Vygotsky 1978) but could easily be a teacher or learning developers. Mentors are able to assist the learner to more easily understand or recognise what they know, what they don't know and what they need to do to find out.

Argyris et al. (1985) depict the essence of the mentoring process as one in which teachers have to be prepared to step outside their more comfortable roles as 'experts'.

[Mentors] must be willing to make themselves vulnerable and to put their own reasoning and actions on the line, subjecting them to the same scrutiny to which they subject the reasoning and actions of [the students]. They must be able to contend with their own defensive reactions and remain open when their views and actions are called into question, often without much compassion or skill. And they must do all this while simultaneously negotiating a dilemma faced by [student] and [mentor] alike. On the one hand, the [mentoring] process is intended to be jointly controlled, with participants taking responsibility for their own learning; while on the other hand, the process necessarily starts out under conditions of inequity. At the outset [students] are largely unaware of their theories-in-use and only vaguely aware or able to envision the alternatives posed by the [mentor].

[Students] therefore enter the process in a position of dependence on the [mentor]. They discover in an explicit sense that they know their own theories-in-use less well

than the [mentor] does, and they have scarcely any idea about how to remedy the gaps they uncover in them. Understandably this discovery triggers experiences of distress and anxiety that themselves evoke reactions that can get in the way of working through the dilemma that triggers them. [Students] may concealed, even from themselves, the inconsistencies of their actions. They may resist the help of the [mentor] in discovering these inconsistencies or the alternatives that might reduce them (Argyris et al., 1985, p. 269).

In this project, mentoring provided a mechanism to review and reorient learning environments, including teaching practices in which students had not achieved success. It also provided a method for students to re-engage in the learning process and move through their ZPDs. A recent graduate, who was taken through this process, described the mentoring process in the following way:

Find the individual's base line, thereby reinforcing the student's comfort. Then, build a framework which will allow the student to climb at their pace. That is, let them find their own way up their own mountain [ZPD] (Gluck and Draisma 1997, p. 42).

The mentoring process enables reflections to be shared with teaching staff, expert positions to be let go of and collaborative systems and feedback loops to develop between mentor, teacher and students. This results in the transformation of all into co-learners and the development of an interactive system that enriches the learning environment. Something new is brought into being (Gluck 1997).

Mentoring in Physics

Mismatches between teaching and learning processes became apparent early in the project. For example, Nursing students were having difficulty with Physics. The following depicts a typical conversation between students and the AEC mentor.

Students: We can't understand what the lecturer is talking about!

Table 1 Staff and learning development within the mentoring process

Relationships within mentoring	Development occurring in the interaction
student and mentor	student learning development
mentor and lecturer	staff teaching development
mentor, lecturer and tutor	staff teaching development
lecturer, tutor and students	learning development and teaching development

Mentor: Are specialist tutorials [provided by the AEC] helping?

Students: Not really. The tutor just really repeats what the lecturer has been doing. We reckon we're going to fail.

Discussion with students ruled out the 'lack of background' or 'deficit' argument frequently used when discounting students' ability to succeed. Students had demonstrated competence in numeric operations required for successfully undertaking Physics subjects for the Nursing degree prior to admission to study.

Past performance revealed they had not come to grips with the process and language that was being used to teach and pass Physics tests. For example, the process of questioning in open ended or objective tests was largely unfamiliar to the students. They had no familiarity with questioning techniques that required them to identify a correct answer from a range of possibilities, where the question was phrased in the negative, such as 'Which one of the following is not appropriate in this context?'

The mentor obtained students' permission to meet the lecturer and argue that the learning issue was not a question of lacking basic numeracy but rather the discourse of Physics. The mentor, lecturer and tutor utilised a role play in which a Physics problem was posed for solution to unpack the teaching and learning situation and develop a strategy to work toward meeting students' learning needs. The mentor took the part of the student while the lecturer and tutor proceeded to instruct the mentor on how to perform a Physics test. As the process took place, the mentor recorded the

language and the steps involved in performing the test. The lecturer was required to make explicit his tacit knowledge (see Lincoln and Guba 1990) or 'theory-in-use' (Argyris et al., 1985).

As a result of this process it was possible to create a flow chart of the language and steps that a student would have to understand and operate to successfully perform the test and complete subsequent Physics tasks. The following steps are the result of the role play.

- 1 List the formulae, give the formulae names and
- 2 describe what they are used for.
- 3 Detail what each symbol means and list unit of measurement for each symbol.
- 4 Write each formula out in English.
- 5 Create a list of questions for each formula.
- 6 Select key words or phrases which apply to each formula, and therefore show how to choose the correct equations.
- 7 Then, in symbol form, rearrange the formula so the unknown is on the left and the known is on the right.
- 8 Cancel the units, if possible, doing the arithmetic in units.
- 9 Make sure the units on the left equal the units on the right.
- 10 Check the arithmetic. If the units don't match up, check why not?
- 11 Then put the numbers with their units in the place of the symbols.
- 12 Use calculator. Check calculator entry procedure.

The tutorial process was then amended to teach the students to unpack the requirements of a question in

order to solve a variety of Physics tests. Students previously knew how to perform these operations, but did not have control of the language associated with the request to perform them. The consequence of transferring this insight, derived in the role play, to the tutorial process enabled students to move from the concrete to the abstract and from the known to the unknown rather than from the abstract to the more abstract and the unknown to the greater unknown. (This process was identical to a direction previously taken in Chemistry. See Draisma and Gluck et al., 1994).

Table 1 identifies the relationships that occurred within the mentoring process in Physics. It also places these relationships in the context of both staff development and learning development.

Mentoring in acute care nursing

Work undertaken in the 200 level subject, Acute Care Nursing, provides a further example of the benefits of collaborative activity between the mentor, students and lecturers to enhance the learning environment and benefit mainstream student learning.

Students who entered 200 level were experiencing learning difficulty in a new subject, Acute Care Nursing. A discussion took place between the Nursing lecturer and mentor about what Aboriginal students' learning needs were and how they had been successfully supported in first year. Details of how a Chemistry tutorial process (Draisma and Gluck et al., 1994) and the above Physics process were shared and an agreement to work collaboratively in the development of an Acute Care Nursing learning development tutorial was achieved. Details of resources and expertise that the AEC could bring to the process were discussed. Discussion included access to specialist tutors and funds and learning development resources through established relationships between the AEC and Aboriginal Tutorial Assistance Scheme and the Learning Development Centre (LDC).

The following diagrams (Figures 1 to 7) illustrate the sequence of relationships that were networked (using the brokerage model of Kelly and Sewell 1988), in order to develop the learning environment. The seven sequences illustrate changes in the network of relationships as the process matured:

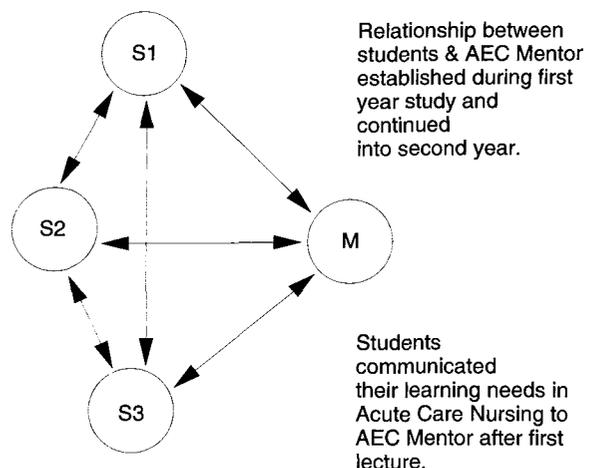
- from bringing students, teachers and resource personnel together for the purpose of aligning students learning needs with teaching;
- to an academic development network that included mainstream students.

In Figures 1 to 7, the following abbreviations apply:

M	= Mentor, Aboriginal Education Centre
H	= Head of Learning Development Centre
L	= Lecturer in Acute Care Nursing
STAC	= Specialist Tutor in Acute Care
S1, S2, S3	= Students

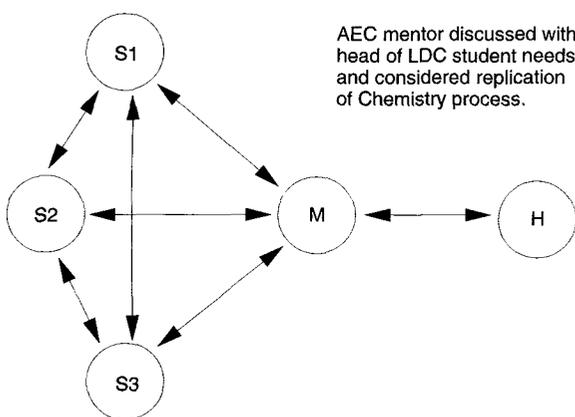
Sequence 1 shows the relationship between the students and the AEC Mentor at the successful completion of first year (100 level). This relationship carried into 200 level studies and provided a basis for students to communicate their learning needs as they entered a new field of study, Acute Care Nursing.

Figure 1 Academic network sequence 1



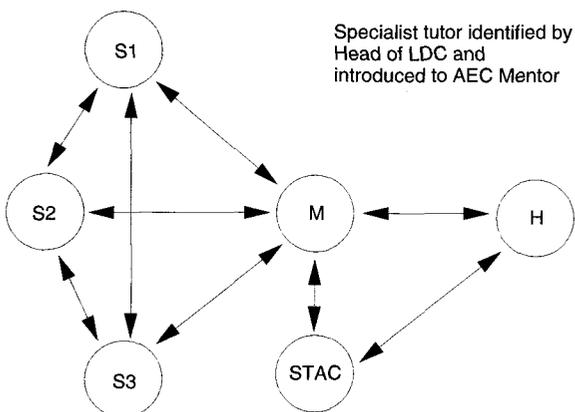
Sequence 2 shows the AEC Mentor approaching the Head of the LDC to discuss students' learning needs and the possibility of replicating the work undertaken in Chemistry for Nursing (see Draisma and Gluck et al., 1994) in order to provide a learning environment that would enable students to gain control of their learning in Acute Care Nursing studies.

Figure 2 Academic network sequence 2



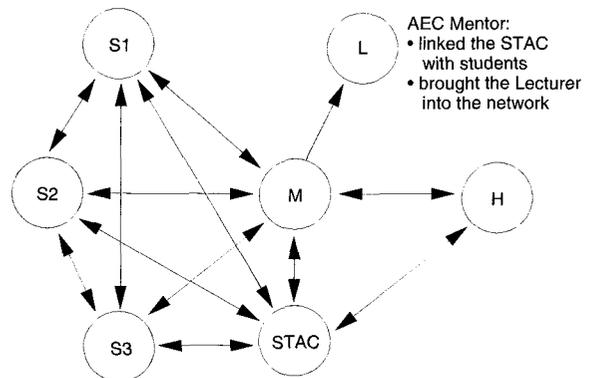
Sequence 3 illustrates the identification of an appropriate specialist tutor in Acute Care Nursing (STAC) and the start of a network between the AEC Mentor and the Head of the LDC.

Figure 3 Academic network sequence 3



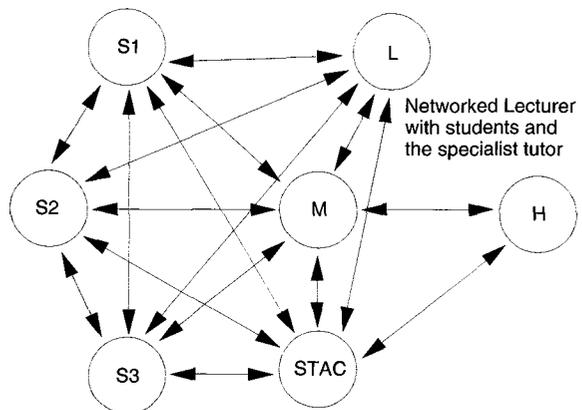
Sequence 4 shows the bringing of the STAC and the AEC Mentor into the relationship network and the initial contact between the Lecturer and the AEC Mentor.

Figure 4 Academic network sequence 4



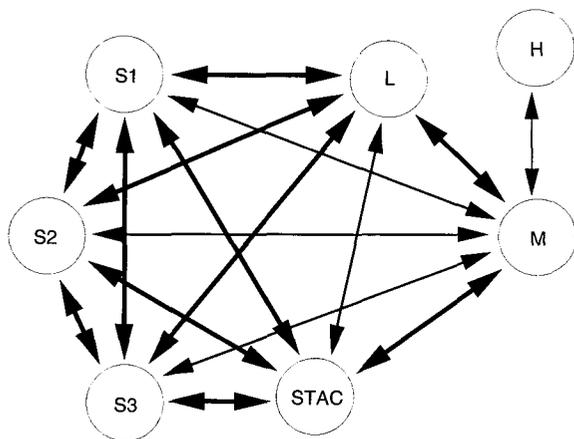
Sequence 5 highlights the introduction of the Lecturer into the students' network.

Figure 5 Academic network sequence 5



Sequence 6 shows the maturation of students' academic development network and highlights the density of information flow between individuals in the network. Students and the mentor jointly identified the need for weekly learning objectives that enabled them to assess their learning activity. The mentor communicated the needs of the students to the lecturer who developed weekly learning objectives. Students further identified and communicated the need for tools which would enable them to self assess their learning and demonstrate their ability to meet weekly learning objectives. The lecturer developed self assessment tools and distributed the learning objectives and self assessment tools to all students.

Figure 6 Academic network sequence 6



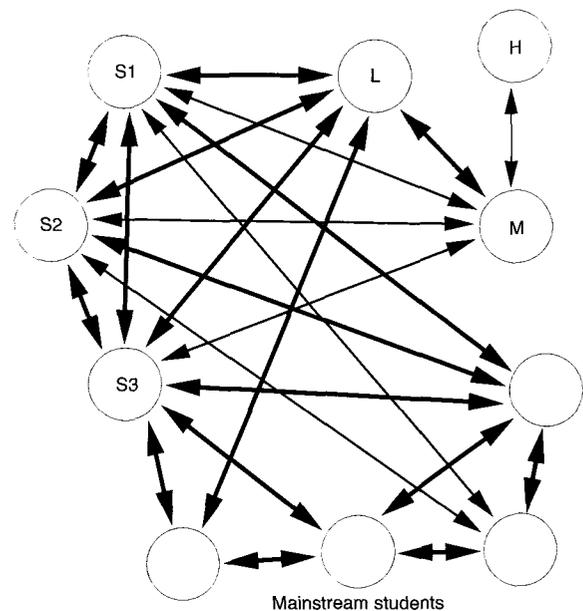
The shape of the students' academic development network is illustrated above. The thickness of the lines illustrates the relative shift in the strength of links and density of information that flowed between individuals as the academic development network matured.

Here the students are operating at Stages I and II of Vygotsky's Zone of Proximal Development where performance is assisted by more capable others or themselves, but where that performance is not fully developed nor automatized. The lecturer, mentor and special tutor in Acute Care Nursing were engaged in scaffolding student performance to enable students to shift to the next level of the ZPD.

Sequence 7 illustrates a form of the self directed academic learning development network which incorporates mainstream students and highlights the departure of the STAC.

Here students have reached Stage III of the ZPD where performance is developed, automatized and fossilised. The assistance of 'more capable others' in the form of the special tutor in Acute Care Nursing is no longer needed. Students would enter Stage IV, the recursive stage of the ZPD, when they next encountered a new subject or entered a learning environment that required different knowledge and/or skills.

Figure 7 Academic network sequence 7



Mentoring: A process for engaging students and teachers in learning

Teachers were generally receptive to approaches by the AEC mentor to discuss teaching practice and Aboriginal students' learning needs but students were not necessarily enamoured when first approached about self-defeating learning strategies and actions, particularly those who continually 'threw every ounce and fibre of themselves' at tasks in the belief that what was required were massive solo efforts. The theories-in-use for some students were characterised by pre-established notions that collaborative learning is cheating and leads to being shamed; reflection with others on learning tasks is big noting and sets up conditions for being shamed by teachers and ostracism from student groups. When they set themselves up for failure, students' theories-in-use needed to be challenged.

After graduation, a student who participated in the mentoring process provided comment on this process and previously self-defeating learning strategies:

This was a very painful period — aching! Self defeating learning strategies was a major hurdle . . . It was a big

step facing [my] own inadequacies . . . accepting them . . . and then the challenge to find strategies that worked and fitted; strategies I was comfortable with (Gluck and Draisma 1997, p. 46).

The mentor recognised, firstly, that students wanted to learn and this required them to look at what underpinned their learning practices (theories-in-use). Secondly, students wanted to protect themselves from the pain and vulnerability that learning involves. Willingness to learn and the need for self protection are 'generic to all growth and learning that is central to one's sense of self' (Argyris et al., 1985; Diamond, 1983; Sullivan, 1953) and are not unique to Aboriginal students. The issue for learners and the mentor was the development of safe territory for reflective relationships which enabled individuals to manage the tension between 'having a go' and 'self-protection'.

Mentoring supported the reflective process by providing a practical means of working with these tensions in the learning 'space'. It facilitated relationships that enabled students to redefine their theory-in-use related to learning.

Conclusion

Mentoring enabled students to raise learning issues in the context of the system of relationships that created the learning environment. Students were enabled to address the goodness of fit between instruction received and their process of maturing or moving toward attaining their potential in the field of study. Mentoring provided a safe forum for students to voice lack of fit and consider appropriate strategies to communicate their needs to providers of instruction. Mentoring also enabled willingness to admit not knowing, aspiration to know, imagination and experimentation with ways of knowing to generate new learning possibilities for the total environment.

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