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DEVELOPING EFFECTIVE SCHOOL AND UNIVERSITY PARTNERSHIPS FOR TEACHER EDUCATION

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Abstract

The use of school-university partnerships to address the theory-practice divide in teacher education has recently come to attention in international teacher education studies (e.g. [1], [2]). School-university partnerships are particularly important in primary science teacher education as a means to overcome limited opportunities primary pre-service teachers have to observe and practice science teaching during their Practicum. Their opportunities are limited due to a lack of practising teachers who include science in their classroom teaching or who do not feel sufficiently competent to act as science mentors. This is generally attributable to low teacher confidence and knowledge of how to teach science [3].

This workshop will report on a study which is exploring existing school-university partnerships in science teacher education at 5 Australian universities. Utilising a multiple case study methodology [4], the project has examined the experiences of establishing, maintaining and developing these partnerships and explored the benefits of the partnerships for pre-service teachers, practising teachers and schools.

A key outcome of the project is the development of an “Interpretive Framework” in which partnership practices were exemplified, contextualised and summarised, documenting key phases in the development of partnership arrangements. The Framework is currently undergoing validation with Australian universities. In this paper, the authors present the Framework to an broader audience for comment and seek to explore its relevance and transferability to school-university partnerships in an international context.

Keywords: School, University, partnerships, theory to practice, teacher education.

1 INTRODUCTION

This paper introduces a project designed to address two areas of international concern in teacher education: primary teachers’ lack of science knowledge and confidence to teach science, and ongoing criticisms about the effectiveness of traditional approaches to teacher education. The project, called Science Teacher Education Partnerships with Schools (STEPS) [5] reviews and builds on established, innovative and successful practices at five Australian universities, to develop and promote a framework supporting school-based approaches to pre-service teacher education.

The need for innovative approaches to science education arises from the following two key bodies of research. Firstly, science educators’ concerns that school students disengage from science and how this relates to the amount and quality of science teaching occurring in primary schools [6]; and secondly; international and on-going criticism about the quality of teacher education with calls for pre-service teachers (PSTs) to engage more with the teaching profession in authentic ways.

Science education research indicates that students are ‘turn off’ science across the middle years of schooling, and that, in the primary years, science is approached in a disconnected fashion or not at all with young people often not seeing science as relevant to their lives. Additionally, some of the teaching approaches are not informed by the research ([7], [8]).

The need to improve science education outcomes is not only an educational issue but also one often linked to the economic priorities of a nation ([9], [10], [11], [12], [13]).
Concurrently, the perceived inability of teacher education programs to bridge the theory-practice gap that exists between academic programs at university and the school setting ([14], [1], [15]) has led to calls for more school centred approaches to prepare PSTs ([16]. A number of government reports in Australian have called for teacher education programs to utilise a partnership approach ([17], [18]), arguing that practical teaching experiences in schools helps PSTs to better link educational theory with classroom practice. The “Top of the Class” report into teacher education ([18]), argued it is essential that:

...universities build strong relationships with schools. In order to ensure that the practicum is linked to theory, school staff must be more involved in the design of the curriculum around practicum. Clearly, schools will be more inclined to welcome practicum students if they stand to benefit from doing so. (p.78).

In support of this, the Australian Academy of Deans of Education ([19]) submission to the Victorian parliamentary inquiry into teacher education argued for an embedded and central positioning of professional practice in teacher education in ways that [relate] professional experience to theoretical insight. The relationship between theory and practice needs to be seen as "mutually informing" (p.3), and they call for research into new pedagogies that promote such practices.

The STEPS project researchers argue the outcomes described above are worthwhile but will not result from an apprenticeship based approach to teacher education. STEPS is predicated on a professional conception of teaching and the need to provide authentic teaching practice as a basis for understanding theory; an outcome only achievable when schools and universities work closely together in partnership.

Some see the practicum as providing the vehicle for this to occur as it provides authentic opportunities for PSTs which cannot be easily simulated at university ([20], [16]). However, as pointed out by [21], universities generally have little control over the practicum experiences of their students or the teachers with whom the PSTs engage.

McIntyre, Byrd, and Fox ([21], p.174) described effective practicum as ones in which university coursework is integrated with the practical teaching experiences; that include a reflective mentoring approach and; include staff development for the colleague teachers. Darling-Hammond ([1]) has also asserted that teacher education programs need to provide opportunities for PSTs to analyse and apply theory; reflect on their subsequent practice; and have further opportunities to retry and improve.

Ure, Gough and Newton ([22]) pointed to a range of tensions and ambiguities inherent in traditional practicum partnership arrangements, and recommended a number of outcomes including: closer collaboration between universities and schools; clarification of the purpose of the practicum; and a re-conceptualisation of effective teaching and teacher development. They called for research focused on "increasing the links between the placement experience and the academic content of programs to create more informed knowledge about the application of pedagogy" (p. 56).

The features recommended by Ure, Gough and Newton ([22]) align strongly with the partnership approaches at the core of the proposal in this study as the school-based experiences in the five participating universities in STEPS in which science education academics provide opportunities for primary PSTs to teach science in schools, and actively promote reflection on their science experiences in the light of relevant learning theory. This supports an increased clarity of purpose for the new teacher of primary science. It supports PSTs to perform and function more effectively in the primary classroom, by enabling a more positive relationship with the enabling others in the school setting ([23]). Alake-Tuenter, Biemans, Tobi, Wals, Oosterheert & Mulder (2012) ([24]) reviewed current literature on competencies required by primary teachers and recommended that PSTs "need mentoring and support within the context of their internship" and that "[s]trong partnerships between teacher training institutions and primary schools might contribute to achieving this goal" (p.27).

Returning to the context of science education, Mulholland and Wallace (2003) ([25]) examined the particular needs of in-experienced teachers as they learn to become effective teachers of science. They concluded that there are particular difficulties associated with becoming a teacher of science, while Nilsson and van Driel (2010) ([26]) also found this was the case for experienced teachers with limited science backgrounds. As many primary PSTs have little experience of, or commitment to science, their allegiance to science and what Shulman (1987) ([27]) referred to as their pedagogical content knowledge (PCK) is often lacking.

These are critical issues when considered in combination with other studies which show that the development of children’s understandings is fundamentally tied to the quality of teaching ([28], [19]),
thus highlighting the need for significant improvements in current and future primary teachers’ attitudes, personal efficacy and ability to teach science effectively. In a sense there is, therefore, an extra layer of concern for PSTs learning to teach (in general) and learning to teach in the specific context of science which explains the emergence of the STEPS project.

A growing body of research related to STEPS has shown that the incorporation of partnerships into science teacher education provides benefits for PSTs’. They gain in confidence to teach science and develop their science PCK ([29], [30]). In designing such authentic learning experiences, the literature suggests that the role of the university lecturer is also crucial in supporting PSTs ([31]) by, for example, providing science PCK expertise that may not otherwise be readily available from many primary teachers ([32]).

While this research points to factors embedded in specific programs, the purpose of the STEPS Project is to identify the critical success factors for establishing effective partnerships and to situate these within a coherent Interpretive Framework, which is discussed further below. Once in place, the Framework could also prove to be applicable more generally, to curriculum areas other than science and would thus be inclusive of a wider variety of partnership arrangements and pedagogies.

Mastery experiences, meaning experiences of personal accomplishment, are central to building confidence and one of the most influential sources of efficacy ([33]). Furthermore, an individual’s perceived efficacy is a strong determining factor in: the types of activities and settings in which individuals elect to participate ([33]); their resilience and perseverance to overcome perceived barriers ([34]); and the types of strategies with which they select to teach ([3]). This suggests that, if provided with opportunities to successfully teach science to children, the self-efficacy of PSTs about their ability to teach science would improve. Subsequently, PSTs’ willingness to plan and conduct science lessons should increase as should their selection of appropriate science teaching strategies. Evidence emerging from STEPS suggests that the approach is effective in increasing students’ confidence and interest, and capabilities in teaching science ([35]).

Evidence is also emerging that in-service teachers who participate in partnerships with PSTs view their participation as professional learning ([36], [32], [37], [26]). The most productive situation seems to arise when a good professional relationship has been established between the PSTs and their in-service colleagues and when these relationships operate on a mutually supportive basis rather than the supervisory nature of the old practicum situation.

However, Korthagen, Loughran and Russell (2006) ([38]) argued that learning does not occur through the experience alone, but rather through reflection on experience and through interaction with others. Lunenberg and Korthagen (2009, p.229) ([39]) described “triangular relationships” that link practice to experience and theory through reflection on events. This process helps PSTs link theory their practice ([40]). Darling-Hammond (2006) ([1]) also offered the view that the integration of course-work and fieldwork helps PSTs to better ‘understand theory, to apply concepts they are learning in their course work, and to better support student learning’ (p. 307). This integration of theory and practice through the key role of reflection better prepares PSTs to ‘handle the problems of everyday teaching through theory-guided action’ ([38], p. 1021), a finding also supported by ([26]).

2 HOW STEPS ADDRESSES THESE ISSUES

Each of the five universities involved in the STEPS Project had independently developed models involving partnerships between the university and local primary schools to enable pre-service primary teachers to engage in authentic experiences of teaching science in local primary classrooms.

On coming together to form the Project team, and since, through critical appraisal of these approaches, the Project has begun to identify the key features of the partnership approach and the critical success factors required to establish and maintain strong working relationships with their schools and build the capacity of PSTs.

Therefore STEPS directly addresses criticisms of the theory-practice gap, not by being subsumed in the teaching practicum, over which a university has little control, but by explicitly creating authentic teaching opportunities as part of their science education studies and supporting PSTs as they undertake the required planning and teaching. PSTs are supported to implement sound science educational theory in a real classroom setting and also to reflect on their own learning as beginning teachers of science. While such reflection on practice that responds to the quality of the experience
can be difficult to sustain and assess, it is critically important for informing PSTs' developing PCK, professional identity and teaching philosophy ([29]).

Therefore, in summary, the key strength of the STEPS Project is that it simultaneously addresses two key areas of national concern about teacher education: it promotes more authentic teaching experiences that bridge the theory practice gap; and addresses the confidence and competency of primary teachers to teach science.

The researchers are mindful that each of the five science education programs was developed for a particular context and operates within local constraints. The intention of the Project is to use these five programs as a basis for exploring the key factors underpinning school university partnerships, but to then validate these factors by engaging with other universities, both within Australia and internationally, to develop a more robust and generalisable theoretical basis for these approaches to teacher education.

It should be noted, however, that significant variations existed within the five programs involved in STEPS to begin the process. The programs included variations in:

- the way PSTs interact with school children, which ranges from working with small groups through to teaching a whole class;
- reflective practices, ranging from teaching team reflection to individual teachers, with the reflective focus on individual students, small groups or whole class analysis;
- how theory informs the approach and positions the students;
- assessment focus and purposes;
- the nature of the partnership and the degree to which teacher professional development is incorporated into the partnership.
- whether PSTs attend schools as a group or individually.
- the time period that PSTs are actually involved in the schools.

Data has been collected from the various stakeholders at each university including, teacher educators, PSTs, school teachers and principals. The analysis will enable an evaluation of the programs and the identification of more generalisable key factors for effectiveness of the partnerships. Materials are also being developed from the analysis in an attempt to theorise the development of the partnership arrangements between schools and universities. Development and dissemination of these outputs has begun to will continue throughout the life of the project and beyond.

In the first phases of the project the team has identified key elements of good partnerships as including

a. ensuring a close relationship between educational theory and classroom practice;

b. establishing productive partnerships between universities and schools in teacher education, involving academics, school teachers and leaders, PSTs and school children; and

c. the centrality of reflective practice focusing on the development and implementation of curriculum, the relational and instructional elements of the pedagogical contract, and the development of PST’s professional identity.

This Project now moves into a stage of validation of the findings by providing opportunities for academics, teachers and other interested stakeholders to contribute to the further development and evaluation of the outcomes and materials resulting from the Project so far, which include:

1. A synthesis of the variety of teaching and reflective practices and informing theories used in school-based science teacher education programs.

2. Documented exemplars of innovative pedagogies that represent the range of contexts, constraints and affordances that lead to quality student outcomes.

3. An emerging Interpretive Framework informed by contemporary practice that can guide improvement of science teacher education programs.

4. Sustainable methods for establishing and maintaining effective school-university partnerships generalisable across a range of contexts.
Our aim is to facilitate uptake of innovative school-based practices within the sector for the purpose of improving the educational outcomes for children resulting from better science teacher education programs, and teacher education programs generally.

As mentioned above, a main outcome of the project is the development of an Interpretive Framework. In the next phase of its development, the STEPS researchers are hoping to refine the Framework by exploring where similar approaches occur at other institutions, both within Australia and Internationally. To this end, STEPS researchers are currently conducting a series of round table discussions, workshops and seminars at conferences including ASERA, EduLearn 14, ATEA, HERDSA, and AARE. At each of these events, the Framework will be presented and discussed.

When completed, the Framework will: support judgments about current practice; provide a framework for initiating partnerships based approaches; describe the nature of the theory-practice relationships; articulate the nature of relationships integral to the partnership; and how they link to the notions of reflection and teacher identity formation.

2.1 What is an Interpretive Framework?

In the context of approaches to pedagogy and teacher education, an Interpretive Framework is an organised schema for examining and understanding practice, as well as conceptualising and implementing practice. It is both generative and evaluative. It describes the ‘who’, ‘what’ and ‘why’ of practice: who is involved, what are we doing, and why are we doing it (this way) and possible outcomes.

An Interpretive Framework includes principles to guide stakeholder action or a construct by which to analyse pre existing constructs. In summary, an Interpretive Framework:

• is a framework for examining and understanding practice;
• is a framework for conceptualising, structuring and implementing practice;
• consists of guiding principles;
• provides the structure for documenting each project;
• helps to understand those who may stand to benefit or be affected by the activity;
• and incorporates the views of those likely to be affected.

In the context of the STEPS Project, the development of the Framework has been a collaborative and iterative process with the team, drawing on their personal experiences with their own partnership programs backed up by a review of the literature, development of an annotated bibliography and an evaluation of the five approaches in the Projects.

Initial discussions identified various elements of the project. These elements related to theory underpinning the approach; the potential impact of the school-based practice; and the specifics associated with the different models of practice of the project team (see Fig. 1).

The five approaches used by each university were all different in terms of local differences and contexts; the schools used; the nature of the school-based approach. The specifics of each model varied depending on the unit aims and goals and nature of the partnerships involved. In addition, the variety of models included meant that the project could begin to generate some critical success factors and barriers.

2.2 Conceptualising the Interpretive Framework

The first stage to developing the Interpretive Framework was to identify the most fundamental elements underpinning our practice – who is involved, what are we doing, and why are we doing it this way. We decided the framework must:

• Be broad enough to allow for depth of theoretical exploration within the different dimensions
• Have practical application
• Have theoretical application
• Draw on current practice
• Draw on current literature
• Lead to new practice
• Support the development of new practice
• Encompass all elements of establishing and implementing practice

We looked at existing frameworks from the literature and government and organisational documents. These frameworks were represented in different ways such as:
• Diagrams/figures with key elements that were discussed
• Tables with relationships between various elements or components, what might be done, and possibilities or outcomes.
• Full documents that described the background theory, lists of the framework elements that are teased out, and case studies to contextualise and apply the framework.
• Descriptions of various elements.

This Project strives to describe practices that might not be possible without the partnership arrangement. In its current form the Interpretive Framework consists of two main sections:
• Growing University-School Partnerships (GUSP) and
• Representations of Partnership Practices (RPP).

These are outlined in more detail below. The first table (GUSP) attempts to incorporate the needs of the key stakeholders, the elements of practice, and rationale. It also provides scope to understand establishing, implementing and evaluating practice through these partnerships. The second table (RPP) attempts to capture the components at each of the establishment, implementation and evaluation phases of a partnership.

2.2.1 Key stakeholders
• Schools: Those schools involved in the partnership, usually recruited by the science education academic through an existing partnership, such as, placement schools; through other research or educational activities by the academics; or recruited for more pragmatic reasons such as closeness to the university.
• Teachers: Teachers at the school whose classes are involved in the program, or other teachers in the school that might be influenced in some way by the program.
• Children: Children at the partnership schools involved in the learning and teaching activities conducted by the PSTs
• Pre-Service Teachers: University PSTs enrolled in the units that incorporate the school-based programs. They are usually responsible for planning, conducting, reflecting on and reporting on a primary science unit of work involving children
• University: responsible for preparing PSTs to be teacher-ready.
• Science education academics, course directors: Those involved in delivering the courses that incorporate the school-based programs. The course directors are the directors of an entire teacher education course or program, and generally have an overall understanding of the values, goals and intentions of the course, and may or may not have an appreciation of the role that school-based experiences add to the overall PST experience.

2.2.2 Elements of practice:
• Content knowledge, skills, nature of science (NOS): science content from the science curriculum selected for teaching to PSTs and/or taught by the PSTs to school children.
• How to teach, pedagogy: Teaching approaches and strategies that are considered fundamental to science education. These may be part of a tutor-led curriculum, and maybe part of the planning and implementation of units developed by PSTs. For example, probing prior understanding, representation theory, inquiry, promoting curiosity, Science in Society (SIS) components of effective teaching.
• General pedagogy: Pedagogy that may also be part of the tutor-led curriculum, but which also PSTs bring with them from the broader education course or program. For example, classroom management, questioning, standards of graduate teachers, dealing with diversity
2.3 Growing University-School Partnerships (GUSP)

This part of the Interpretive Framework (Table 1) describes the phases of initiating, implementing and evaluating school-based teacher education. The descriptions have been derived through analysis of the practices of the 5 initial examples developed independently by members of the STEPS project.

Fig. 1: Case studies: Identified components of growing school university partnerships

Fig. 1 shows the five components describe the likely processes and thinking required at each phase of development. While the development from initiation to evaluation appears to be linear, in reality it is likely to be an iterative process and one responsive to the needs of all stakeholders. This might mean starting again at another school if, for example, a previous school becomes unavailable for some reason.

Descriptions of the processes involved in developing these types of partnerships help others who might be considering adopting such partnerships to be aware of the thinking and planning is needed over time. It also can help those within existing partnerships by providing a language to talk about often undocumented and amorphous practices.

Table 1 is intended for use by school and university stakeholder groups. While the content of most of the cells is the same, it will be interpreted slightly differently by each group. However in the third column (Elements of Practice) each cell is specifically differentiated for universities and schools to reflect the clearly different roles and activities undertaken by each.

Table 1: Growing University-School Partnerships (GUSP)

<table>
<thead>
<tr>
<th>A. Need and Rationale</th>
<th>B. Institutional and Unit Demands</th>
<th>C. Partnerships</th>
<th>D. Pre-service teacher interactions with children</th>
<th>E. Elements of Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify mutual and differing needs and provide rationale</td>
<td>Identify constraints and affordances governing the approach to partnership development</td>
<td>Negotiate and define value and parameters defining the nature of the partnership</td>
<td>Conceptualise an approach to PST interactions with children.</td>
<td>For Universities: Establish guiding principles for practice that can occur within the partnership. For Schools: Consider options for level of involvement in feedback and personal reflection.</td>
</tr>
</tbody>
</table>
## 2. Implementation Phase

**Be mindful of the needs and rationale and be responsive to emerging needs**

**Manage, compromise, justify and respond to demands (limitations and possibilities)**

**Maintaining and working with partners to meet individual and differing needs of partners**

**Enabling interactions with children that reflect subject-related and general content and pedagogy**

*For Universities:*

Draw on informing theories, and modeling reflective practice and subject-related content and pedagogy.

*For Schools:*

Reflect on current level of involvement in feedback and professional learning.

### 2.3.1 Components of Growing University School Partnerships (GUSP)

**A. Need and Rationale**

Whether initiating, implementing or evaluating a university-school partnership, the needs of each partner and their respective rationale for being involved in the partnership need to be considered. This ensures that each partner’s core requirements are accounted for in the establishment of a partnership arrangement.

In effective partnerships, partners regularly check with one another in the implementation phase to ensure that each other’s needs are being met, and where possible, arrangements are flexible enough to meet emergent needs that may not have been apparent in the initiation phase. In the evaluation phase each partner should review ways in which arrangements did or did not meet their respective needs and adjust the partnership arrangement accordingly for future iterations.

**B. Institutional and Unit Demands**

Both universities and schools have a range of constraints that may shape the way in which a partnership can be organised. Aspects such as timetabling, curriculum and resources, expertise, to name a few, may limit the extent of the partnership arrangement.

Each organisation should try to identify as many constraints and affordances as possible to ensure the success of a partnership. Partners should also be prepared to respond, if possible, to changing constraints if and when they become apparent during the partnership implementation periods. The evaluation phase also allows for improvements to be identified and planned for in further partnership iterations.

### 3. Evaluation Phase

**Evaluating the needs and rationales for their continued relevance and future possibilities.**

**Evaluating against institutional demands and considering different possibilities & approaches.**

**Evaluating the nature of the partnership to respond to current and future needs and possibilities.**

**Evaluating the nature of interactions drawing on a range of evidence, including key stakeholders’ reflections and educational research.**

*For Universities:*

Examining effectiveness of practices in response to institutional, unit, and partnership changes and needs.

*For Schools:*

Evaluating current practices and consider future levels of involvement in feedback and professional learning interests/needs.
C. Partnerships

An essential aspect of initiating a partnership arrangement is to define the type of partnership that is desired/possible. Defining the nature of the partnership means considering the role each person is wanting and able to commit.

Table 2 (Representations of Partnership Practices) shows that partnerships can be connective, generative or transformative. Each of these types of partnership is valuable in its own right, but provides different opportunities for the level of partners’ involvement before, during and after the partnership period. This explores the nature and extent of partner roles in more detail. In evaluating the nature of the partnership, each partner can reconsider their level of involvement and maintain similar or negotiate different levels of involvement for future iterations.

D. Pre-service teacher interactions with children

The PSTs’ interaction with children in the classroom is the core purpose of the partnership. Here, the learning experiences of the children are of fundamental concern. Thus careful planning of the types of learning experiences - ways in which subject and general content and pedagogy is implemented – is essential. Involvement in the planning and implementing of PSTs’ interactions with children can depend on the nature of the partnership that has been negotiated. In evaluating these interactions, both partners should consider the experience of the children, and how educational research can inform the most effective experience possible.

E. Elements of practice

When initiating a partnership, guiding principles of practice should be discussed between the partners. The guiding principles allow partners to establish the elements of practice that will be enacted in their partnership.

For universities, these principles are strongly informed by educational research, particularly related to science education and effective teacher practice.

For schools, the level of involvement in the partnership should be considered before, during and after the partnership so the elements of teachers’ practice within the partnership is selected to best meet the needs of the school, the teachers and the children involved.

1. Table 1 is intended to enable stakeholder groups considering establishing partnership arrangements to plan out the extent and nature of the approach based on their resources and constraints.

2. To evaluate, map, and or plan to further develop an existing partnership arrangement

2.4 Representations of Partnership Practices (RPP)

This part of the Interpretive Framework (Table 2) depicts a typology of practices. These types—described as Connective, Generative and Transformative, describe the degree of embeddedness and apply to four aspects of the partnerships: the nature of the purposes; the partner institutional structures; nature of the partnership as collaborative or cooperative; and the extent to which the process explicitly builds professional identity by linking theory and practice through reflection on the experiences of the various partnership stakeholders.

The table is not designed to imply greater value on one approach over another, but is meant to represents the differing types of practices possible each with its own value and arising out of desired purposes and educational outcomes, and local constraints rather than as a expected trajectory that a partnership should move through in order to reach maturity.

At this stage, the descriptions in each cell have been derived from the analysis of the practices of 5 universities in the Project. Further validation and development is needed from groups and practices outside of the project.

2.4.1 How to use the RPP Framework

Table 2 is intended for use by school and university stakeholder groups who will interpret the content in each cell from their own perspective.

The descriptions of the types of partnerships provided might assist those who are considering entering into partnerships to clarify the desired learning outcomes, structures, and level of responsibility to
taken by each partner. It also may help those within existing partnerships by providing a language to articulate the process or clarify the structure which may currently not be documented.

A need was also recognised for the Framework to inform quality or type of partnership practices. This explicitly draws links between theory and practice, and institutional structures. Through discussion, moving down the columns, the table shows a typology of increasing levels of stakeholder engagement not to imply greater worth of one form over the other, but to show the full spectrum of options and variability available, accepting that all partnerships will have value.

<table>
<thead>
<tr>
<th>A. Purposes</th>
<th>B. Institutional structures</th>
<th>C. Nature of partnership</th>
<th>D. Linking theory with practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Connective</td>
<td>Engagement based on provision of curriculum or other service need.</td>
<td>Partnership activities are short-term and opportunistic and sit within existing structure.</td>
<td>Partners provide short-term services with a focus on one partner’s needs but with mutual benefits and value for all.</td>
</tr>
<tr>
<td>2. Generative</td>
<td>Partners recognise opportunities for mutual professional learning</td>
<td>Partnership activities are considered long-term and are planned and catered for in the teacher education and school programs.</td>
<td>Partners jointly plan the structure of the school-based practices to the benefit of both.</td>
</tr>
<tr>
<td>3. Transformative</td>
<td>Partner involvement based on active professional learning</td>
<td>Partnerships are embedded in the ongoing structures and practices of the institutions.</td>
<td>Partners take joint responsibility for mutually agreed practices and outcomes that are embedded in their respective core outcomes.</td>
</tr>
</tbody>
</table>

2.4.2 Components of representations of Partnership practices (RPP)

A. Purposes

The rationale for partners, particularly schools, for participating in the school-based partnership.

B. Institutional Practices

The structures that exist within each institution and how they are managed and/or adapted to facilitate the school-university partnership.

C. Nature of Partnership

The level of co-operation or collaboration between partners to service a need or engage in joint effort and commitment to partnership outcomes.

D. Linking theory and practice

The level of involvement of each partner in reflection on theory and practice and opportunities for professional identity development.

2.4.3 School-University Partnership Typology

1. Connective

Connective partnerships are co-operative in nature. They are typified by a “win-win” outcome where each partner recognises a key benefit/value from working together. They arise when one or other of the partners may have a particular need and the other is able to provide a space or service to accommodate that need. These partnerships sit within existing structures and tend to be “one-off” or
short-term in nature. They are provided because both partners recognise schools as important sites for PSTs to link theory and practice. These partnerships meet important short-term needs and provide seeding opportunities for other partnerships and/or more long-term generative or transformative partnerships.

2. Generative
Generative partnerships, whilst still mainly co-operative in nature, see a greater level of commitment and participation from both partners. These partnerships generate new or different practices and outlooks in the school and university programs by committing to longer-term involvement in the partnership arrangement due to the recognised mutual benefits. Partners respond to one another’s needs to develop programs that may involve small modifications to existing structures in order to accommodate one another’s needs. PSTs are engaged in reflection on their practice where they make links to underpinning theoretical ideas. Teachers are cognizant of what PSTs are doing in the classroom and this provides opportunities for them to also reflect on practice that may be linked to theory. These partnerships meet important long-term needs and are well-established in both the school and university planning.

3. Transformative
Transformative partnerships are collaborative and focused on active involvement in planning and delivery of curriculum for the purpose of professional learning. They are on-going and embedded in the programs of the collaborating institutions. Partners have a vested interest in working collaboratively to develop key practices and outcomes that are aligned with and fundamental to their teaching and professional learning. Partners engage in critical reflective practice that is guided by theory-practice nexus and over time develops a sense of professional identity forged through their collaborative experience.

Vignettes are currently being developed to illustrate what each cell might look like in practice.

2.5 Feedback on the Framework
1. Does the experience in Australia match with your experiences here regarding teacher education? Science education? If so How? If it is different, how?
2. Do you feel the Interpretive Framework could be adapted to suit your situation or the needs of your stakeholders? Explain.
3. Are you aware of any other partnership based programs or colleagues who might be interested in this work who we can contact?
4. How would the Framework assist you in planning? Evaluating developing your partnership arrangement?
5. To what extent are the tables independent?
6. Are programs able to exist within different levels of the tables concurrently?

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