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Proposed Principles for Promoting Pre-service Teacher Transfer of Group-based Learning to the Classroom: A Discussion Paper

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Abstract: The effective 'transfer' of knowledge and skills from university to the workplace is of global interest, yet this area of inquiry lacks research. Teacher educators, for example, require information on how to advance pre-service teachers' transfer of group-based learning to the primary school classroom (Scott & Baker, 2003). Group-based learning (GBL) is a valued means of developing learners' group work, personal attributes and interpersonal skills, and in the case pre-service teachers their professional skills.. Graduate teachers do not necessarily generalise GBL pedagogy to the classroom. This discussion paper draws from a qualitative case study that examined this pedagogy in a pre-service teacher education program at Edith Cowan University. The case study revealed three core GBL issues: 'consistency and coherence'; 'equity and fairness'; 'pragmatism and adding value'. This paper proposes four principles of effective transfer and examines how, in relation to these three issues, these principles can promote effective transfer.

Introduction

Educational literature highlights group work as a purposeful and relevant approach to facilitate learning and teaching. Cooperative, small group work can advance children and youths' academic achievement, critical thinking, social interactions, communicative behaviours, self-esteem and motivation (see Ashman & Gillies, 1997; Gillies, 2003; Johnson & Johnson, 1998; Slavin, 1987). There is substantial evidence demonstrating that group-based learning (GBL), along with other peer-mediated learning approaches, is one of the most successful and influential pedagogic techniques (Gillies et al). GBL encompasses learning occurring with, from, and through other people. It is conducted in a wide range of primary and secondary schools including those for learners from diverse backgrounds (Johnson & Johnson, 2000). It is used as a learning and teaching medium for language, literacy, numeracy, humanities and science based classes. There is international and national research evidence that supports the use of GBL in our schools (Gillies, Ashman, & Terwel [Eds.], 2008; Kutnik, Ota, & Berdondini, 2008).

If "teacher education [is] to prepare prospective teachers for the use of these skills in their future classrooms" then teacher education courses need to model cooperative learning and make explicit to pre-service teachers cooperative learning values, theories and practices (Veenman, van Benthum, Bootsma, van Dieren, & van der Kemp, 2002, p. 276). Echoing this point, Ashman and Gillies (1997, p. 276) in a study involving GBL with Year 6 children concluded that: "teachers need to be trained to introduce cooperative learning practices if groups are to work effectively". Similarly, Kutnick et al (2008) state that developing effective GBL outcomes for and with children relies, in part, on the commitment and ability of teachers to foster a 'collective learning environment'.

The use of GBL pedagogy can challenge teachers as they may lack the theoretical and practical knowledge of how to apply (i.e., transfer) GBL principles, practices and resources to their classrooms (Gillies et al, 2008; Kutnik et al, 2008). Pre-service teachers' transfer of knowledge and skills from a university to a classroom setting is considered "one of six most basic and pressing arenas in which educational research needed to make progress in the 21st century" (Schoenfeld, in Lobato, 2006, p. 432). Teacher education is constantly criticised regarding its perceived failure to prepare beginning teachers adequately for classroom work (Grossman, 2005; Hughes, 2006; Scott & Baker, 2003). This is compounded by the lack of evidence-based research regarding the transfer of teaching knowledge and skills from university to the classroom (Scott & Baker, 2003; Scheeler, 2008). The *Top of the Class* report into teacher education in Australia calls for research regarding the "effectiveness and impact of different forms and elements of teacher education" (House of Representatives Standing Committee on Education and Vocational Training [HRSCEVT], 2007, p. 6). This includes the transfer of GBL to the classroom.

The topic of how GBL theoretical and practice-based knowledge is transferred by beginning teachers into their classrooms is the primary focus of a longitudinal research project being conducted at Edith Cowan University (ECU), Perth, Western Australia. ECU is the second largest supplier of teachers in Australia. Its biggest single course is the Kindergarten through Primary (K-7) which prepares pre-service teachers to teach children aged 3.5 to 12 years. In 2007, K-7 staff collectively identified a concern associated with their apparent lack of consistent terminology used to describe GBL; the limited coherent alignment of GBL across all K-7 course units and government and university documents; and the transfer of GBL ideals and practices between K-7 staff, and to and between the pre-service teachers.

In response to these concerns, an insider-research (Sikes & Potts, 2008) case study was established to examine K-7 staff (n=16) beliefs, theory and practice of GBL within their teaching program with the aim of improving the consistency, coherence and transferability of this pedagogy (see Cullity, De Jong, Sharp, Spiers, Turner, & Wren, 2008). In addition to illuminating staff beliefs, theories and practices about GBL, the case study offered an opportunity to identify and critically engage with issues allied to transfer. This discussion paper progresses the theme of GBL issues and transfer. With reference to the challenge of transfer, it examines three core issues identified in the case study, namely 'consistency and coherence'; 'equity and fairness'; and 'pragmatism and adding value'. The case study findings suggest that if pre-service teachers are to transfer GBL to the classroom, teacher educators/academics need to consider: the 'consistent and coherent' use of GBL terminology and practice across the pre-service teacher education course; the notion of 'equity and fairness' in respect to GBL supporting or hindering pre-service teacher learning and assessment outcomes; and whether or not GBL is a 'pragmatic' or 'value adding' pedagogic strategy.

These issues are complex, inter-related and provocative. As such, we propose that: the efficacy with which the GBL theoretical and practice-based knowledge is transferred by pre-service teachers to the classroom will be enhanced if the nature of, and relationship between, these issues and transfer is better understood and actively addressed in teacher education. We advance this proposition by tendering four principles of effective transfer and examining how, in relation to the GBL issues and relevant literature, they can promote effective transfer.

Principles of Transfer

The transfer of knowledge and skills from one context to another can generate images of a person comprehending and acting on new information. Research and education literature shows different theoretical paradigms ranging from industry-based ideas; and psychodynamic psychology to social cognitive theory, epistemology and constructivism. Some authors perceive transfer as a linear process. Others claim that it is a dynamic and interdependent process. The technical-rationality (theory to practice) approach appears to be predominant (Tigchelaar & Korthagen, 2004). Most emphasise the

challenge of integrating theory and practice. All acknowledge the complexity of transfer. Some emphasise the *pedagogy of teacher education* (e.g., Korthagen & Kessels, 1999); others, such as Lobato (2006, p. 431), argue that the difficulties with transfer are to do with methodological and theoretical problems with the 'transfer construct'. Lobato suggests that learning and transfer are conceptually indistinguishable.

Based on our work (Cullity et al., 2008), we have taken an eclectic approach and synthesised our ideas with that of other researchers. We, then, propose a set of four principles that are fundamental to pre-services teachers' transfer of education knowledge and skills from a university to classroom setting. These four principles are propositional and are outlined below.

Principle 1 (Pedagogic)

Transfer is a particular construct which needs to be understood and applied from a practical and theoretical perspective. Successful transfer of theoretical and practice-based knowledge is fundamental to good practice and achieving outcomes for all. As such, it is necessary that the practice and theory of transfer is an explicit component of teacher education. Pre-service teachers should be adequately prepared for the challenges of transfer, be reflective of their experience of transfer, be able to monitor their transfer progress, and improve their theoretical understanding and practical application of this process. This principle draws on ideas presented by Scott and Baker (2003) and Scheeler (2008) who separately advocate the need to make explicit to pre-service teachers the nexus between transfer-based theory and practice if they are to articulate this knowledge and skills to the classroom.

Principle 2 (Systems Thinking)

Transfer is a recursive, dynamic and interdependent process. Transfer influences and is influenced by context, is multidimensional and is in constant change. It occurs at many levels: within-the learner; between the learners; between the learners and teachers; and between the learners and their school context. This systems thinking principle reflects ideas promoted by Senge, Roberts, Ross, Smith and Kleiner (1994), and is implicit in Tigchelaar and Korthagen's (2004) 'Gestalt practice to theory' model.

Principle 3 (Philosophy of Learning)

Transfer is a constructivist process, being influenced by prior knowledge and actively shaped by the learner. Learners assimilate and accommodate theoretical and practice-based knowledge according to their existing understanding, insights and experiences. This principle is implied in Lobato's 'Actor-oriented transfer perspective' (2006) and the 'Gestalt model' (Tigchelaar & Korthagen, 2004).

Principle 4 (Qualitative Differences)

Transfer occurs in qualitatively different ways. At a basic level, theoretical and practice-based knowledge is applied to meet the needs of others without modification. At a more complex level it is modified and adapted to meet the needs of others. Ultimately, the flexibility with which learners can apply their knowledge and skills responsively to the context will be dependent on how comfortably and confidently they have been able to accommodate them within their existing repertoire of learning and teaching strategies. This principle emerges from the 'Articulation' model (Baker, Scott, & Showers,

1997; Scott, & Baker, 2003) which asserts that transfer occurs at 3 levels: horizontal, vertical, and executively.

Of what significance are these principles of transfer to GBL? In short, it lies in our contention that if the nature of, and relationship between, the three identified issues and the construct of transfer is better understood and actively addressed in teacher education, then the efficacy with which the GBL theoretical and practice-based knowledge are transferred to the classroom will be enhanced. In advancing this proposition, we turn to examining the nature of the three GBL issues and how they and the principles of transfer relate to each other. We also consider some specific strategies that can promote effective transfer.

Effective GBL Transfer: The Issue of ‘Consistency and Coherence’

The case study (Cullity, et al., 2008) highlighted that individual K-7 staff hold firm ideas about the semantic understanding of the terms ‘team’ and ‘group’ work and they expressed differences of opinion as to whether these terms locate GBL pedagogy and outcomes within, first, a shared/working together or a competitive relationship; and, second, how some staff align GBL to a cooperative or a collaborative pedagogic approach. Project findings revealed how individual staff allude to a pedagogic confidence about the role of GBL and that each of them hold a private understanding of the purpose of GBL in his/her K-7 unit.

At first glance these differences are hardly surprising and provide a healthy tension for debate. It is evident from a cursory review of group-based learning literature that this pedagogic approach is varied in concept, practice and terminology. In their discussion of GBL methods used in higher education Strijbos and Martens (2001, para. 2) commented ‘There are no clear guidelines to determine what group-based learning method should be applied. Quite often it seems a subjective decision, based on either teaching pedagogy preferences or the prevailing theoretical research paradigm’.

Further, the literature reflects much contestation regarding definitions and philosophical underpinnings of GBL. For example, there is on-going debate regarding the elements of cooperative learning and collaborative learning (Dillenbourg, 1999; Panitz, 1996). The challenge of developing a shared understanding of GBL appears to be elusive too. Dillenbourg (1999, p.1) reports that a group of 20 scholars who had explored collaborative learning could not agree on a definition of this pedagogic approach.

Consistency of Definition: A Core Issue for Course Design

The higher education sector admires academic integrity. Autonomy of practice is closely guarded by academics. It is considered critical to encouraging pre-service teachers to engage with the breadth of world views and not be married to one particular ideology. So, having a range of GBL definitions, theories and practices across a teacher education course upholds academic freedom and supports democratic choice. In short, a prescriptive understanding of GBL amongst teacher educators is contrary to academic freedom and constraining of transformative learning for pre-service teachers.

Alignment of Issues to Principles of Group-based Learning

The challenge, then, for lecturers is to make GBL choices appropriate to the learning needs of pre-service teachers and even take an eclectic approach to course design. Panitz (1996, para. 19) suggests that whilst there are distinct similarities and differences between the ideals and processes of cooperative learning and collaborative learning, by focussing on the specifics of each approach educators “run the risk of polarizing the educational community”. He argues that of greater benefit than the cooperative/collaborative discussion is the appropriate selection and use of either the cooperative or

collaborative approach when assisting students to learn. Strijbos and Martens (2001) propose a dynamic perspective on social interaction and assert that different approaches to GBL pedagogy may “result in different interaction processes, and thus be applicable to achieve different learning objectives” (abstract). A mixed tactic is advocated by Gumperz, Cook-Gumperz, & Szymanski (1999) when they discuss the relevance of collaborative processes in a classroom that uses cooperative learning principles.

The above perspectives beg the question: “Is it actually imperative to have consistency of understanding of the concept of GBL and coherence of its application?” We would argue unequivocally “yes”. The premise of our position is fundamentally concerned with supporting *successful transfer* of GBL theory and practices, as stated in Principle 1. The assumption is that an explicit and consistent definition of GBL across and within the delivery of a teacher education course (i.e., a ‘whole-of-course’ approach) is important because the work of pre-service teachers requires the application of GBL pedagogy in their classrooms. In comparison to most other professions, this adds a complex and unique dimension to the role of a teacher. This complexity needs to be understood in relation to the principles of transfer too. Our contention (Principle 3) is that transfer is a constructivist process that is recursive, dynamic and interdependent. It is likely that adopting a ‘whole-of-course’ approach that propagates a consistent and coherent definition and practice of GBL will permit these principles to be more manageably understood, implemented, sustained and monitored in relation to the quality and success of transfer.

Complementing the teacher’s unique role in the transfer of GBL pedagogy to the classroom is the proposition that transfer of theoretical and practice-based knowledge will be enhanced by: (1) initial learning focusing on *understanding* principles; (2) the explicit explanation of cause and effect relationships and reasons; and (3) principles of application are directly engaged (Darling-Hammond & Bransford, 2005). This proposition is supported by Korthagen and Kessels’ (1999) observation that one of the core causes of the ‘transfer problem’ in teacher education is the tendency of lecturers to overlook the pre-service teachers’ preconceptions about learning and teaching. The authors refer to Corporaal who interprets the poor transfer of theory to practice as a lack of integration of the theories presented in teacher education (‘the teacher educator’s theory’) into the conceptions student teachers bring to the teacher education program (‘the student teachers’ theory’) (Corporaal cited in Korthagen & Kessels, 1999, p. 5).

Lobato (2006) raises the same issue when she promotes the ‘actor-oriented’ perspective in the transfer of knowledge and skills. This perspective includes “the influence of learners’ prior activities on their activity in novel situations, which entails any of the ways in which learning generalizes” (p. 437).

Teacher educators need to consider pre-service teachers’ prior knowledge of GBL theory and practice if they are to utilise and develop their students’ understanding of this pedagogy (i.e. Principle 3: Transfer as a constructivist process). To do otherwise is to ignore an existing and valuable pool of knowledge. Tigchelaar and Korthagen (2004) advance this transfer notion by advocating the need for teacher educators to work actively with their students’ prior knowledge. The teacher educator is challenged here to facilitate for the pre-service teacher a link between earlier experience, practice and theory in order to enrich existing Gestalts. This underscores the importance of, in the first instance, developing a consistent and coherent shared approach to GBL; secondly, making explicit across a teacher education course the beliefs, theory(ies) and practices associated with this pedagogy; and thirdly, highlighting the principles of transfer and how they might ‘look’ in practice. In particular, Principle 1 advocates that transfer is a construct that needs to be understood and applied from a theoretical and practical perspective. This understanding will go some way to addressing the concern that not enough research attention is paid to the *pedagogy of teacher education* (Tigchelaar & Korthagen, 2004).

A cautionary note, underpinned especially by principles 2 and 3, is necessary though. Engaging in developing consistency and coherence will require an ongoing, planned, reflective and monitored process. Knowledge is not absolute. It is changing and hence the shared understanding is changing. The process should include constant reflection on the notions and practices of GBL, and sharing these

reflections with colleagues and pre-service teachers so that GBL evolves rather than becomes static. There should be a tacit goal to work towards a culture of critical appraisal of the theory and practice of GBL by pre-service teachers and staff. Principle 4 underpins these ideas.

Effective GBL Transfer: The Issue of ‘Equity and Fairness’

Cullity et al. (2008) revealed that K-7 staff appear confident in their frequency of use of GBL, the choice of GBL as an effective pedagogic approach, and the use of GBL to assess pre-service teachers’ work. The pragmatic and pedagogic aspects of GBL rarely worry staff. Rather, K-7 staff are concerned about how to engage pre-service teachers actively in the group learning process so that all group members contribute to and gain from the GBL event. Key to this was the notion of ‘equity’ and ‘fairness’ in respect to the extent to which GBL supports or hinders pre-service teachers’ learning and/or assessment outcomes. Typical dilemmas included: (1) whether or not it is fair to ask pre-service teachers to attend outside-of-class meetings when some of them will have adult responsibilities (e.g., work, domestic, sporting); (2) the challenge of staff ensuring that the ‘time’ and ‘location’ issues of holding out-side-of-class meetings is equitable and fair to all pre-service teachers; and, (3) if the group assessment task requires additional work, should staff or pre-service teachers be accountable for ensuring these meetings have occurred?

It is evident that individual and group assessment is integral to GBL and challenges teacher educators. Group assessment is used to develop pre-service teachers’ self and peer assessment practices; for example, they assess each others’ work and justify the feedback and mark given (Zeegers, Russell, Davies, & Menon, 2005/2006). This assessment activity requires the pre-service teachers to explore and co-construct ideas and knowledge (Zeegers et al.) thus reflecting Gregory and Thorley’s (1994) notion of GBL. Similarly, pre-service teachers require knowledge of assessment marking criteria, a template, or rating guide if they are to independently judge their and others’ work (Crowe & Pemberton, 2002; Johnson & Johnson, 2004; Hughes, 2002; Race, 2001; University of Technology Sydney [UTS], 2007).

There is ample evidence that student learning outcomes are enhanced when group-based learning is carefully structured and monitored (Johnson & Johnson, 2004), and when students have opportunities to develop effective group processing skills (Slavin, 1995). However, inequality of effort from individual students thwarts the intended learning and teaching outcomes of the GBL experience. Pseudo groups, for example, can occur when individual members become travellers/‘free-riders’ (Strijbos & Martens, 2001) rather than active participants and this can create difficulties when monitoring and assessing pre-service teacher outcomes.

We know that there are well established strategies designed to maximise equity and fairness in GBL activities. For instance, the need to maintain individual accountability is paramount to the overall success of building students’ social interdependence (Johnson & Johnson, 1998) so that each student is accountable for his/her own and the group’s outcome(s). Despite these strategies, the case study and literature (for example: Cullity, et al., 2008; Strijbos & Martens, 2001; Johnson & Johnson, 2004; Kriflik & Mullan, 2007) suggest that the equity and fairness issue remains the greatest challenge in ensuring that learning outcomes are achieved and that a healthy attitude is developed towards the pedagogy.

Threats to Effective Transfer

In our view there are two possible ramifications, both of which have the potential to undermine effective transfer. Firstly, non-participatory pre-service teachers limit their opportunity to understand GBL pedagogy and subsequently their capacity to apply this theoretical and practice-based knowledge to the classroom. Secondly, and perhaps most profoundly, participatory pre-service teachers who have

had acute experiences of inequity and unfair practice may as a result either abandon the pedagogy all together or apply it in a fashion that is primarily pragmatic with little or no value-addedness in terms of learning (the subject of the third issue).

In addition to ensuring that a teacher education program covers the full range of GBL strategies to maximise equity and fairness, such as individual accountability, establishing shared goals, and social interdependence (Johnson & Johnson, 2004, 1998, 1994), we advocate that the theory, principles and practice of effective transfer are explicitly embraced as an intrinsic element of the equity and fairness issue. This could, for example, involve pre-service teachers purposefully reflecting on their experience of fairness and equity:

- How their experience of this issue has influenced and been influenced by their beliefs, knowledge, skills and application of GBL (Principle 2: Transfer as a recursive, dynamic and interdependent process);
- How their past and present experience is shaping their GBL beliefs, knowledge and skills (Principle 3: Transfer as a constructivist process); and,
- How their experience of this issue is impacting their application of GBL in the classroom (Principle 4: Transfer occurs in qualitatively different ways).

If relevant, this reflective process can be accompanied by ideas for problem-solving the issue with the aim of promoting effective GBL transfer.

In summary, we assert that successful transfer is unlikely to take place unless pre-service teachers are scaffolded into developing future learning skills; this point is similar to the ideas of expressed by Darling-Hammond and Bransford (2005); and Bransford and Schwartz (1999). This includes supporting pre-service teachers to understand the nature of any GBL issues, such as equity and fairness, how they articulate with the efficacy of theoretical and practice-based knowledge transfer, and how to address these issues when experienced by them and the children they teach.

Effective GBL Transfer: The Issue of Pragmatism and Adding Value

There is an abundance of higher education texts that outline ways to plan, structure, implement and monitor GBL activities (e.g., Biggs & Tang, 2007; Gardner & Korth, 1997; Gibbs, 1992; Johnson & Johnson, 2004, 1998; Race & Pickford, 2007). In addition, the nature of GBL is largely dependent on the intended learning outcomes, the needs and characteristics of the students and the resources available.

An intended outcome of GBL in the K-7 course is to advance pre-service teachers' interpersonal skills with peers and professionals. Cullity et al (2008) revealed that friendship and random selection are the preferred means of organising in-class groups, and friendship is the preferred means of organising groups when pre-service teachers undertake an assessment task.

The common practice of organising 'friendship' based groups raises questions about the pragmatic (*ad hoc*) or value added nature of this strategy. To what extent does it enhance pre-service teachers' learning, transfer of skills or other intended course outcomes (e.g., interpersonal skills)? Does the predominance of using this approach to organising groups contradict the notion of organising a balanced demographic within groups (Johnson & Johnson, 2004)? Does this indicate K-7 staff's reluctance to create a level of cognitive and/or social dissonance as a catalyst for learning or whether a key priority is individual group harmony? Of relevance to these questions is the belief most K-7 staff hold that GBL offers pre-service teachers a collegial and safe learning environment. Some staff (Cullity, et al., 2008) noted that the idea of a secure learning milieu can be disrupted when group members become aggressive (i.e., dominate) or passive (i.e., free rider) participants and, thereby, disadvantage other learners. What does this reflect about the potential value that GBL can add to participants' learning about conflict management and, then, transferring this to the classroom? In short, in what ways does GBL add value to pre-service teachers' social, academic, affective, personal and professional selves? We address these questions in the discussion that follows.

Adding Value to Pre-service Teachers' Selves

At the heart of these questions is a core issue about the pragmatic and value added nature of different group structures, how these GBL structures enhance learning, and the subsequent efficacy of theoretical and practice-based knowledge transfer. Cullity et al (2008) highlighted this matter. In particular, some staff raised concern as to whether or not GBL provides a productive learning environment, despite their belief that GBL had developed pre-service teachers' academic, professional, inter- and intra-personal and social abilities.

We advocate that there are pragmatic and applied purposes of GBL (e.g., lecturers managing their workload) and that GBL ought first and foremost to be used in ways that add real value to student learning. Student learning is advanced, that is, when they are encouraged to engage meaningfully with theoretical and practice-based knowledge at a critical, conceptual and reflective level. This belief is consistent with the 'deep learning approach' as proposed by Biggs and Tang (2007, pp. 24-26). The idea of value adding to student learning mirrors Bruner's theory of 'meaningful learning' which states that the quality of learning is enhanced when students understand through direct experience key concepts and how they relate to each other (McDevitt & Ormrod, 2007). Applying GBL to primarily value-add is encapsulated in the 'Articulation' model of transfer (Baker, Scott, & Showers, 1997; Scott & Baker, 2003) which contends that the probability of successful transfer of theoretical and practice-based knowledge can be increased by embedding intensive fully elaborated training designs for teacher education programmes (i.e., including theory-demonstration and peer micro-teaching components). We argue likewise.

The prospect of effective transfer of GBL knowledge and skills will be advanced if pre-service teachers are engaged in GBL processes that add value to their learning rather than, predominantly, meeting their and their lecturers' pragmatic needs; for instance, when a particular group-based assignment is based entirely on skills criteria and not social criteria (e.g., friendships). This can be achieved when the design of the assignment optimises the collective skills within their group and builds their capacity to manage potential conflict productively. This idea is underpinned in Principle 4 (Transfer occurs in qualitatively different ways). We believe that GBL experiences enrich and enhance pre-service teachers' theoretical and practice-based knowledge. Nonetheless, GBL work should be carefully mediated by the lecturer (as opposed to relying on incidental learning) as, then, the capacity and confidence of the student to effectively transfer this knowledge will be increased significantly. This is likely to strengthen student opportunities to apply knowledge and skills at a 'vertical transfer' level and, possibly, gain 'executive control' more rapidly (assimilation of theoretical and practice-based knowledge with confidence in application) (Scott, & Baker, 2003).

Conclusion

The multiple pedagogic, pragmatic, assessment and professional roles demanded of GBL illustrate the importance of this learning and teaching approach. Successfully transferring the theoretical and practice-based knowledge of GBL from university to the workplace, particularly for pre-service teachers, remains a significant challenge. In respect to this challenge, Cullity et al (2008) examined teacher educators' beliefs, theory and practice of GBL and illuminated three key issues of consistency and coherence; equity and fairness; and pragmatism and adding value that are associated with this pedagogy. In this paper we have proposed four principles of effective transfer and considered how, in relation to these GBL issues, they can promote effective transfer. In doing so, we have argued that the efficacy with which the GBL knowledge and skills are transferred to the classroom will be enhanced if the nature of and the relationship between these issues and transfer is better understood and actively addressed in teacher education.

Our intention in writing this paper is to understand better the multifaceted character of beginning teachers' transfer of GBL theoretical and practice-based knowledge to their classrooms. This

discussion, we believe, contributes to an evidence-based foundation for the current phase of our research which is to examine: 'how K-7 pre-service and beginning teachers transfer group-based learning pedagogy into the classroom'.

References

- Ashman, A., & Gillies, R. (1997). Children's cooperative behavior and interactions in trained and untrained work groups in regular classrooms. *Journal of School Psychology, 35*(3), 261-279.
- Baker, R., Scott, S., & Showers, B. (1997). Attacking the articulation problem in teacher education. *Australian Journal of Teacher Education, 22*(2), 1-5.
- Biggs, J., & Tang, C. (2007). *Teaching for quality learning at university*. Berkshire, England: SHRE & Open University Press.
- Bransford, J., & Schwartz, D. 1999. Rethinking transfer: A simple proposal with multiple implications. *Review of Research in Education, 24*, 61-100.
- Crowe, C., & Pemberton, A. (2002). *'But that's your job!': Peer assessment in collaborative learning projects*. Retrieved August, 31, 2007 from http://www.tedi.uq.edu.au/conferences/teach_conference00/papers/crowe-pemberton-1.html
- Cullity, M., de Jong, T., Sharp, S., Spiers, S., Turner, W., & Wren, J. (2008). *Mapping group-based learning in the Kindergarten Through Primary Program at Edith Cowan University*. Joondalup, WA: Office of Learning & Teaching, School of Education, Edith Cowan University. Available from: http://www.ea.ecu.edu.au/data/tmp/mapping_gbl_in_k7_final_211008.pdf
- Darling-Hammond, L., & Bransford, J. (2005). *Preparing Teachers for a Changing World. What teachers should learn and be able to do*. San Francisco, CA: Jossey-Bass.
- Dillenbourg, P. (1999). What do you mean by collaborative learning? In P. Dillenbourg (Ed.). *Collaborative-learning: Cognitive and computational approaches* (pp. 1-19). Retrieved September, 16, 2008 from <http://hal.archives-ouvertes.fr/docs/00/19/02/40/PDF/Dillenbourg-Pierre-1999.pdf>
- Gardner, B., & Korth, S. (1997). Classroom strategies that facilitate transfer of learning to the workplace. *Innovative Higher Education, 22*(1), 45-60. [Electronic Journal].
- Gibbs, G. (1992). *Discussion with more students*. England: Polytechnics & Colleges Funding Council.
- Gillies, R., Ashman, A., & Terwel J. (Eds.). (2008). *The teacher's role in implementing cooperative learning in the classroom*. NY: Springer.
- Gillies, R. (2003). The behaviors, interactions and perceptions of junior high school students during small-group learning. *Journal of Educational Psychology, 90*, 747-757.
- Gregory, R., & Thorley, L. (1994). Introduction. In L. Thorley & R. Gregory (Eds.). *Using GBL in higher education* (pp. 19-24). London: Kogan Page.
- Grossman, P. (2005). Research on pedagogical approaches in teacher education. In M. Cochran-Smith & K. Zeichner (Eds.). *Studying teaching in education: The report of the AETA Panel on Research and Teacher Education* (pp. 425-476). Washington, DC: American Education Research Association.
- Gumperz, J., Cook-Gumperz, J., & Szymanski, M. (1999). *Collaborative practices in bilingual cooperative learning classrooms*. Retrieved September, 16, 2008 from <http://repositories.cdlib.org/cgi/viewcontent.cgi?article=1068&context=crede>
- House of Representatives Standing Committee on Education and Vocational Training [HRSCEVT]. (2007). *Top of the class: Report on the inquiry into teacher education*. Canberra: House of Representative Publishing Unit.
- Hughes, J. (2006). Bridging the theory-practice divide: A creative approach to effective teacher preparation. *Journal of Scholarship and Teaching 6*(1), 110-117.
- Hughes, J. (2002). *Tools and techniques for enhancing the quality and effectiveness of student teams*. Paper presented at Higher Education Research and Develop Society of Australasia, Christchurch, New Zealand. Retrieved September, 16, 2008 from <http://ecu.edu.au/conferences/herdsa/main/papers/ref/pdf/ChristensenHughes.pdf>

- Johnson, R., & Johnson, D. (1994). *An overview of cooperative learning*. Retrieved August, 12, 2006 from <http://www.co-operation.org/pages/overviewpaper.html>
- Johnson, D., & Johnson, R. (1998). *Cooperative learning and social interdependence theory: Cooperative learning – together we stand, divided we fall. Social psychological applications to social issues*. Retrieved August, 12, 2006 from <http://www.springerlink.com/content/103n14112205w62n/>
- Johnson, D., & Johnson, R. (2000). Cooperative learning, values, and culturally plural classrooms. In M. Leicester, C. Modgil., & S. Modgil (Eds.), *Classroom issues: Practice, pedagogy and curriculum* (pp. 15-28). London: Falmer Press.
- Johnson, D., & Johnson, R. (2004). *Assessing students in groups: Promoting group responsibility and individual accountability*. Thousand Oaks, CA: Corwin Press.
- Korthagen, F., & Kessels, J. (1999). Linking theory and practice: Changing the pedagogy of teacher education. *Educational Researcher*, 28(4), 4-17.
- Kriflik, L., & Mullan, J. (2007). Strategies to improve student reaction to group work. *Journal of University Teaching and Practice* 4(1), 13-27. [Electronic journal]
- Kutnick, P., Ota, C., & Berdondini, L. (2008). Improving the effects of group working in classrooms with young school-aged children: Facilitating attainment, interaction and classroom activity. *Learning and Instruction* 18, 83-95.
- Lobato, J. (2006). Alternative perspectives on the transfer of learning: History, issues, and challenges for future research. *The Journal of the Learning Sciences*, 15(4), 431-449.
- McDevitt, T. & Ormrod, J. (2007). *Child development and education* (3rd ed.). Upper Saddle River, NJ: Pearson, Merrill, Prentice Hall.
- Panitz, T. (1996). *A definition of collaborative vs cooperative learning*. Retrieved September, 16, 2008, from C:\Documents and Settings\mcullity\Local Settings\Temporary Internet Files\Content.Outlook\PQAT8ZRK\panitz-paper.htm
- Race, P. (2001). *Assessment series No. 9: A briefing on self, peer and group assessment*. Retrieved September, 16, 2008 from <http://internt.iha.dk/paedagogik/seminarer/Chris%20Rust/ASS009PhilRace.pdf>
- Race, P., & Pickford, R. (2007). *Making teaching work: 'Teaching smarter' in post-compulsory education*. Los Angeles: Sage.
- Scheeler, M. (2008). Generalizing effective teaching skills: The missing link in teacher education. *Journal of Behavioral Education* 17(2), 145-159.
- Scott, S., & Baker, R. (2003). Determining the effectiveness of a teacher preparation course by exploring the transfer of complex teaching models by graduates. *Asia-Pacific Journal of Teacher Education*, 31(1), 67-85.
- Senge, P.M., Roberts, C., Ross, R.B., Smith, B.J., & Kleiner, A. (1994). *The fifth discipline fieldbook*. London: Nicholas Brealey Publishing.
- Sikes, P., & Potts, A. (2008). *Researching education from the inside: Investigations from within*. London: Routledge.
- Slavin, R.E. (1995). *Cooperative learning: Theory, research and practice*. Boston: Allyn & Bacon.
- Slavin, R.E. (1987). Developmental and motivational perspectives on cooperative learning: A reconciliation. *Child Development* 58, 1161-1167.
- Strijbos, J., & Martens, R. (2001). Group-based learning: Dynamic interaction in groups. Paper presented at EURO-CSCL Conference, Maastricht, Netherlands. Retrieved August, 5, 2008, from www.ll.unimaas.nl/euro-cscl/Papers/154.doc
- Tigchelaar, A., & Korthagen, F. (2004). Deepening the exchange of student teaching experiences: Implications for the pedagogy of teacher education of recent insights into teacher behaviour. *Teaching and Teacher Education*, 20(7), 665-679.
- University of Technology Sydney [UTS]. (2007). *Peer assessment*. Retrieved June 25, 2008, from <http://www.iml.uts.edu.au/assessment/students/peer.html>
- Veenman, van Benthum, Bootsma, van Dieren, & van der Kemp, 2002

Zeegers, M., Russell, R., Davies, R., & Menon, E. (2005/2006). Towards a pedagogy of group work. *International Journal of Learning*, 12(10), 205-211. [Electronic journal].