Peer Tutoring: Teoretical Foundation and Benefits

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Abstract

Peer tutoring is a very old practice, traceable back at least as far as the ancient Greeks. A theoretical grounding for peer tutoring can be found in L.S. Vygotsky's idea of the Zone of Proximal Development and to the cognitive developmental and socio-cultural theories. The terms peer tutoring, peer mediated learning and peer assisted learning are often used synonymously in the literature. Peer tutoring and cross-age tutoring also go by the names of "peer teaching," "peer education," "partner learning," "peer learning," "child-teach-child," and "learning through teaching" and there has been instances where cooperative learning has been referred to as peer-tutoring. Peer tutoring is one of those terms that seem to have many definitions. The textbook definition of *peer tutoring* is "a system of instruction in which learners help each other and learn (themselves) by teaching," It is commonly used to describe tutoring that is done between two people who are close in age and at a similar academic level. The different models of peer tutoring reported in the literature are: class wide peer tutoring, reciprocal tutoring, peer-assisted learning strategies (PALS) and cross-age tutoring. Many advantages have been claimed for peer tutoring and related forms of peer assisted learning that include more active, interactive and participative learning, immediate feedback, improved academic performance, swift prompting, lowered anxiety with correspondingly higher self disclosure, and greater student ownership of the learning process and the like.

KEYWORDS: Peer tutoring, cross age tutoring, class wide tutoring, reciprocal tutoring.

Peer tutoring is the system of instruction in which learners help each other and learn by teaching. It is commonly used to describe tutoring that is done between two people who are close in age and at a similar academic level. It consists of students teaching other students, of the same or a different age, on a one-to-one basis, or one tutor working with two or three students simultaneously. Peer tutoring is a cooperative undertaking in which students share not only the answers but the process used to reach the answers. It is a beneficial way for students to learn from each other in the classroom. While one student may excel in math, another student may be top-notch in English. These two students can work together to help each other understand difficult concepts, while deepening their own knowledge of the subject. Peer tutoring is a flexible, peer-mediated strategy that involves students serving as academic tutors and tutees. Typically, a higher performing student is paired with a lower performing student to review critical academic or behavioral concepts.

Peer tutoring is a method of teaching in which one student (or a small group of students) receives personalised and individualised instruction (Medway, 1995). In tutoring, the teacher is called a tutor, while the student is called a tutee. Tutoring most

often supplements traditional classroom instruction, which is typically conducted in large groups for those students who require remedial help and those who have difficulty learning by conventional methods. Being closer in knowledge and status, the tutee in a peer relation feels freer to express opinions, ask questions, and risk untested solutions. The interaction between instructor and pupil is more balanced and more lively when the tutor is a peer (Damon and Phelps, 1989).

Theoretical Grounding of Peer Tutoring.

It is likely that peer and cross-age tutoring have been part of human existence since hunter gatherer times. As Jenkins and Jenkins (1987) write, "Tutorial instruction (parents teaching their offspring how to make a fire and to hunt and adolescents instructing younger siblings about edible berries and roots) was probably the first pedagogy among primitive societies". Wagner,(1990) on the other hand, traces the historical origins of peer tutoring in Western civilization back to Greece in the first century A.D. and through Rome, Germany, other European locales, and finally America. Topping's history (1988) dates the formalized use of peer tutoring back to the 1700s. Other academics trace peer tutoring back to the "Monitorial System" of the early nineteenth century (Bland and Harris 1989).
Peer tutoring is a very old practice, traceable back at least as far as the ancient Greeks. Archaic definitions of peer tutoring perceived the peer tutor as a surrogate teacher, in a linear model of the transmission of knowledge, from teacher to tutor to tutee. Later, it was realised that the peer tutoring interaction was qualitatively different from that between a teacher and a student, and involved different advantages and disadvantages.

A theoretical grounding for peer tutoring can be found in L.S. Vygotsky's idea of the Zone of Proximal Development. Vygotsky wrote that problem-solving in collaboration with more capable peer could enable children to enter into new areas of potential (Vygotsky, 1978). These new areas, which Vygotsky called the leading edge of children's intellectual growth constitute the zone of proximal development (ZPD); it is created when a child interacts with a more experienced mentor in intellectually productive ways. Vygotsky argues that it is not only information that is internalised, but also fundamental cognitive processes that are implicit in the communication. Accordingly, both parties of the communication stand to benefit. The tutee profits from the very acts of questioning, challenging and providing feedback to the tutor. The tutor profits from the act of reformulating knowledge for transmittal to the tutee, from answering the tutee's questions and from responding to the tutee's challenges. This is what is meant by the old axiom that one never really knows a subject until one tries to teach it (Damon, 1995).

Webb (1991) found that when students did not understand a teacher's explanation, peers were often able to provide explanations in words that were more easily understood. Othman (1997) conducted a study to gain understanding of significant mechanisms of Peer Tutoring (PT) with respect to the balance between enhancing tutees' learning, while maintaining tutors' own achievement. Data analysis revealed that enhancing tutees' learning required tutors and tutees each to perform roles that were individually relevant. For example, at a cognitive level, tutees had to think aloud, verbalise what they learn, and pay attention. On a behavioural level, students had for example, to listen, cooperate, and compromise explaining, repeating and

providing cues. At the affective level, tutors had to reinforce, praise, and encourage successful responses from the tutees.

Koh's (1998) study revealed that more than half of the respondents perceived small group discussion, case study, student presentation, cooperative learning, PT and role play to be useful active learning strategies for helping students to attain all the higher levels of Benjamin Bloom's taxonomy of cognitive learning outcomes. Nazzal (2000) recommended the use of peer tutoring as an alternative means of lessening the potential effects of several factors that put low socio-economic students at risk for dropping out of school. Peer tutoring reinforced perceptions of students towards the school and decreased feelings of alienation. Brown (2001) reported that mathematics teachers were adopting new teaching strategies such as cooperative learning, hands on activities, computer labs, one-to-one teaching, lecturing, peer tutoring, and guided practice in Alabama High Schools and the teachers' major concerns were student retention, covering of all the course material, student concentration and student attendance.

At this point of development, a definition might have been: more able students helping less able students to learn in co-operative working pairs or small groups carefully organised by a professional teacher. However, as development and research in different formats of peer tutoring proceeded apace in more recent years, it became clear that peer tutoring is not necessarily only about transmission from the more able and experienced (who already have the knowledge and skills) to the less able (who have yet to acquire them). As peer tutoring has developed, defining it has become more difficult, and a current definition seems so broad as to be rather bland: people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by teaching. However, this definition does include reference to the gains accruing from the tutoring process to the tutor increasingly; peer tutoring projects target gains for both tutors and tutees. Peer tutoring is characterised by specific role taking: at any point someone has the job of tutor while the other(s) are in role as tutee(s).

The theoretical basis of peer tutoring can be traced back to the cognitive developmental and socio-cultural theories. (Topping & Ehly, 1998a; Foot & Howe, 1998; Topping & Ehly, 2001). However it also draws on the social learning theories of motivation and social cohesion (Slavin, 1996; Maheady & Gard, 2010; O'Donnell & King, 1999; O'Donnell & O'Kelly, 1994). Piaget's concept of equilibration, the reconciliation of the internal cognitive conflict between assimilation and accommodation, as the process that drives cognitive development was extended by Doise and Mugny (1984) to what they called socio-cognitive conflict. These concepts place great value on the impact peer interactions have on constructing social and moral values, and social and cognitive development (Piaget, 1932; Doise & Mugny, 1984; Maheady, 1998; Foot & Howe, 1998).

The importance of social interactions on development was also addressed by Vygotsky (1978). Vygotsky's sociocultural theory of development described learning as occurring within the zone of proximal development. Vygotsky described this as the difference between what a learner can do unaided, and what they can do supported by more skilled peers (Vygotsky, 1978; Topping & Ehly, 1998a; Foot & Howe, 1998).

As peer tutoring is interactive in its nature, it provides for optimal conditions in which cognitive development can take place (Foot & Howe, 1998).

Cognitive elaboration or restructuring is where the learner makes connections between new and prior knowledge by restructuring existing cognitive structures or adding the new information to them (Foot & Howe, 1998; Topping & Ehly, 1998a; Thurston et al., 2007; Slavin, 1996; O'Donnell & O'Kelly, 1994). Peer tutoring is an effective means of elaboration, as students are able to gain a better understanding of the subject by explaining it to someone else (Slavin, 1996; Maheady & Gard, 2010).

Slavin (1996) identified the social learning theoretical aspects of peer learning as motivation and social cohesion. Reward structures built in to peer tutoring programs provide individual and group incentives to help one another achieve goals (Cohen, 1986; Slavin, 1996; Maheady & Gard, 2010; Rittschof & Griffin, 2001). Social cohesiveness is achieved as pupils become individually accountable and care for the group's and their own learning (Slavin, 1996; Rittschof & Griffin, 2001)

The textbook definition of *peer tutoring* is "a system of instruction in which learners help each other and learn (themselves) by teaching," (Goodlad and Hirst , 1989). Key to this definition is the word *peer,* meaning someone with the same or a nearly equal status as the person being tutored, who, as such, is not a professional instructor. Peer tutoring has played an important part in education and has probably existed in some incarnation since the beginning of civilization. But the first recorded use of an organized, systematic peer tutorial learning project in the Western World didn't come about until the late 1700's.

Arising from school budget woes in the late 18th and early 19th centuries, peer tutoring became an effective way of giving underprivileged (at this time, sadly, only male) children a reasonable shot at an education. The first systematic approach to peer tutoring is credited to Andrew Bell, who was the superintendent of the Military Male Asylum at Egmore, in England (Goodlad et. al., 1989). When Bell took the reins at this institution, the asylum was run as a school for boys whose fathers had been killed during wartime. Bell transformed the asylum into more of an official school.

Like many good ideas, Bell's thoughts on implementing peer tutoring came from a very strange, almost unconscious source. Ever the frugal superintendent, he observed several children drawing in the sand at a beach one day, and then introduced the idea of using trays of sand as cheap writing material in his school (Goodlad et. al., 1989). Since the rest of his teaching staff thought this was absurd, Bell began to use *monitors* -- children to teach each other with sand -- to ensure that the sand trays were indeed being used. Bell later realized that the use of these child monitors was a much more significant discovery than trying to cut costs by using such a highly unorthodox and *sandy* teaching practice.

So, during the years of 1791 and 1792, Bell redesigned his school so that every person had a specific role with associated tasks. He sectioned the school off into classes of students grouped according to their level of achievement. If a student was doing well, he could be promoted to a better class; if his work was sub-par, he could be demoted to an inferior one. Bell arranged each class in such a way that half of the students would perform as tutors and the other half would receive tutors' instructional help.

Also, teachers, teaching assistants and ushers would roam throughout the school helping children, monitoring the tutors and quizzing students to make sure the teaching system was working.

With this experimental system in place, Bell reasoned that the tutors "Enabled their pupils to keep pace with their classes, in which otherwise some of them would fall behind, and be degraded to lower classes, or else continuing attached to their class, forfeit any chance of improvement, by never learning any one lesson as it ought to be learned". Bell's *experiment* is thought to have been one the first examples of the systems approach to educating people. Making use of Bell's tutorial experiment a few years down the line was a man named Joseph Lancaster, who was also enticed by the idea of providing education for children who would not otherwise get it, often because of the social class of their families. Lancaster opened a school in London, England in 1801 where he was responsible for approximately 350 students. Realizing there was no way he could teach this number of students and maintain order at the same time, he decided that boys who knew a *little* were qualified candidates to teach those who knew even less, and gave these boys the means to do so.

Lancaster modified Bell's method somewhat by giving his tutors detailed instructional materials to help them assist others and themselves. He designed very structured, organized teaching materials; he also came up with answer keys, which students could use to drill other students on the material they were learning, while older students monitored them. This was done *while* Lancaster was teaching a different group of students. So, the idea was that those students that were not receiving the headmaster's instruction, never had an idle moment and were engaged in the learning process throughout an entire school day. Another unique aspect of this approach was that it allowed students that may not have even been familiar with subject matter to actually be responsible for *teaching* it. They did this by way of possessing the answer keys and watching the other students work out problems before giving students the answers.

Another key player in the introduction of systematized peer tutoring was William Fowle. Fowle also used a monitorial approach in his school in England in the late 1800's. He conducted studies on his students and began to provide some educational theory to support peer tutorial practices (Ehly and Larson, 1980). Fowle concluded that children could, in some respects be better teachers than adults could because children know that they are in the same boat. Ideally, this causes them to be more considerate and respectful of each other's feelings, rather than feeling panicky due to having to work with an adult who they may feel is judging them and their work every step of the way, and thus holding them back from learning. American educators who shared the lack of financial backing necessary to hire teachers in great numbers heard of the ideas of Bell, Lancaster and Fowle (Elhy et. al., 1980). Taking a cue from these men from their British motherland, American instructors often would rely on certain students to teach others before a school system was put in place. This was the birth of peer tutoring in America. And while it is highly likely that tutoring in very different formats was going on in higher education (and elsewhere), it is important to note that these men's ideas were extremely influential (and egalitarian) before the use of professional teachers became more widespread in the U.S. (Goodlad et. al., 1989).

Terminology.

The terms peer mediated learning, peer assisted learning and peer tutoring are often used synonymously in the literature. Peer mediated and peer assisted learning could be better described as overarching terms which include group instructional learning approaches such as cooperative learning as well as peer mentoring, peer modelling and peer tutoring (Topping, 2005; Topping & Ehly, 1998a; Ryan, Reid, & Epstein, 2004). Peer tutoring and cross-age tutoring also go by the names of "peer teaching," "peer education," "partner learning," "peer learning," "child-teach-child," and "learning through teaching" (Britz, Dixon, and McLaughlin 1989); and there has been at least one instance in which cooperative learning has been referred to as peer-tutoring (Wagner, 1982).

Definitions.

"Peer tutoring" is one of those terms that seem to have many definitions. At Dickinson State, peer tutoring typically refers to 25 to 50-minute sessions between two students, one of whom is a trained tutor, and another who is studying the material the tutor is already familiar with. Peer tutoring is not a substitute for faculty office hours; it is an opportunity to work one-on-one with another student -- someone who can help you see and understand the course material from the student's and, to some degree, the professor's perspective simultaneously (since the peer tutor has already learned the material and has professor approval to tutor).

Probably the most succinct definition of peer tutoring comes from Damon and Phelps(1989a): "Peer tutoring is an approach in which one child instructs another child in material on which the first is an expert and the second is a novice". However, multiple definitions of peer tutoring exist, and they are not all consistent. For example, not all peer tutors are "experts." They are sometimes randomly assigned, same-age classmates (Greenwood, Delquardi, and Hall, 1989; Palincsar and Brown, 1986; Dinwiddie, 1986) or same-aged low achievers (Pigott, 1986). To make matters more confusing, the term "peer tutoring" often subsumes both cross-age and same-age tutoring. As Gaustad (1993) explains: Peer tutoring occurs when tutor and tutee are the same age. In cross-age tutoring, the tutor is older than the tutee. However, sometimes the term peer tutoring is used to include both types.

Finally, some researchers imply that there is no such thing as a true "peer" tutor. As Damon and Phelps (1989b) put it: . . . peer tutoring is often called "cross-age" tutoring, because the tutor is usually two or more years older than the tutee. In a strict sense, the phrase "peer tutoring" is something of an oxymoron. As if the overlap between peer and cross-age tutoring was not confusing enough, peer and cross-age tutoring also go by the names of "peer teaching," "peer education," "partner learning," "peer learning," "child-teach-child," and "learning through teaching" (Britz, Dixon, and McLaughlin 1989); and there has been at least one instance in which cooperative learning has been referred to as peer-tutoring (Wagner, 1982). Furthermore, peer tutoring is a type of "peer resource programming," and shares attributes with youth service, youth involvement, peer helping (or counseling), peer mediation, peer leadership, and cooperative learning. Peer tutoring has also been called one approach to "peer cooperation," along with cooperative learning and peer collaboration. "Peer collaboration" differs from peer tutoring in that children begin at roughly the same

levels of competence when they collaborate to "solve tasks that neither could do previously" (Damon and Phelps, 1989b). Finally, "Mutual Instruction" or MI has been proposed as a more descriptive term than peer and cross-age tutoring (and counseling) (Swengel 1991).

Many varying definitions exist for peer tutoring from simply one child helping another child to more in-depth criteria. Many definitions for the tutoring process involve an expert student assisting a novice student yet this is not always the case (Kalkowski, 1995). At times students were randomly paired to provide assistance. Peer tutoring also transpired when same-age students were paired, and when students were paired with older tutors. Mastropieri et al. (2006) described peer tutoring as groups of two or three combining lower achieving students with higher achieving students for assistance. Further confusing the matter, Mastropieri et al. interchanged peer tutoring and peer-assisted learning. Colvin (2007) suggested peer tutoring occurred within same societal groups and may be formal or informal, may be one-on-one or in small groups, and may involve furthering classroom discussions or solving specific problems. For purposes of this ARS, Goodlad and Hirst's (1989) definition will be utilized which states "peer tutoring is a system of instruction in which learners help each other and learn (themselves) by teaching". Peer tutoring implies that teaching is not being completed by a professional.

Goodlad & Hirst (1989) defined peer tutoring as a system of instruction in which learners help each other and learn (themselves) by teaching. Peer tutoring is an evidence-based instructional strategy that provides academic and social benefits to the tutor and tutee (Topping & Ehly, 1998b). According to Keith Topping and Shirley Hill, "peer tutoring can be defined as "people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by teaching". Peer tutoring usually occur in pairings that involve a higher achieving student tutoring a low achieving peer, same ability matches, cross-age matches or between pupils with learning or behavioural difficulties (Goodlad & Hirst, 1989; Topping & Ehly, 1998a).

Robert Thomas definition on peer tutoring is another definition that is widely acceptable. His definition stipulates that peer tutoring is "the process by which a competent pupil, with minimal training and with a teacher's guidance, helps one or more students at the same grade level learn a skill or concept" ("Cross-age and Peer tutoring," 1993). According to Slavin (1995), peer tutoring is a component of cooperative learning. Utley and Mortweet (1997) defined peer tutoring as "a class of practices and strategies that employ peers as one-on-one teachers to provide individualized instruction, practice, repetition, and clarification of concepts".
Peer tutoring is a method of teaching in which one student (or a small group of students) receives personalised and individualised instruction (Medway, 1995). Paul (2006) defined peer tutoring as an instructional strategy that partners students to help one another learn material, reinforce skills or practice a learned task. Peer tutoring often results in academic, emotional and social gains for the students involved. Through a structured program supervised, planned and monitored by a teacher, peer tutoring can help readers receive individualized and targeted instruction that they may not otherwise receive.

Boud, Cohn, and Sampson (2001) define peer tutoring as involving students‟ learning from and with each other in ways which are mutually beneficial and involve sharing knowledge, ideas, and experiences among participants. The emphasis is on the learning process, including emotional support that learners offer one another, as much as the learning itself. Peer tutoring involves a more able child, the tutor, helping a less able child, the tutee, in a co-operative working pair carefully organised by a teacher (Topping, 1989). Within this system ofinstruction, learners help each other and learn by teaching (Goodlad and Hirst 1989), It may be same-age or cross-age. According to Schloss, Schloss & Schloss (2007) peer tutoring is an instructional strategy where peers act as instructional agents for their fellow students.

Types/Models of Peer Tutoring.

The Access Center explained three common types of peer tutoring. Cross-Age Tutoring involves older students tutoring younger students. While tutors received training, the format of the sessions remained unstructured. Tutors acted as models for behavior, organization, and improving study habits. Another tutoring method was Peer-Assisted Learning Strategies (PALS). The PALS approach includes very structured tutoring in math and reading two or three times a week for about 30 minutes. Higher and lower-achieving students were paired together. The higher achiever always began the session as the model and encouraged the lower achieving student to complete the next step. One other peer tutoring programme was Reciprocal Peer Tutoring (RPT). RPT consists of two or more students working in a structured format of prompting, teaching, monitoring, evaluating, and encouraging. Tutors and tutees alternated roles in RPT. The main differences in training were the amount of structure and number of participants in tutoring sessions, but all three programs indicated peer tutoring is beneficial (Access Center).

The different models of peer tutoring reported in the literature are: class wide peer tutoring, reciprocal tutoring, peer-assisted learning strategies (PALS) and cross-age tutoring (see **Table 1**) (Fuchs, Fuchs, Mathes, & Simmons, 1997; DuPaul, Ervin, Hook, & McGoey, 1998; Topping & Ehly, 1998b; Okilwa & Shelby, 2010; Durrer & McLaughlin, 1995; Ryan et al., 2004; Delquadri, Greenwood, Whorton, Carta, & Hall, 1986; Fantuzzo, King, & Heller, 1992). Peer tutoring has been used in structured and unstructured formats and across different content areas; however it is most commonly applied to reading and maths (Fantuzzo & Ginsburg-Block, 1998; Topping & Ehly, 1998b; Rohrbeck, Ginsburg-Block, Fantuzzo, & Miller, 2003; Ginsburg-Block, Rohrbeck, & Fantuzzo, 2006; Spencer, Scruggs, & Mastropieri, 2003; Spencer, 2006; Spencer, Simpson, & Oatis, 2009). Although peer tutoring can appear in different formats and be applied to different areas, the effectiveness of peer tutoring programs are dependent on similar effective research-based components. These components include: tutor training and preparation, opportunity to practice tutoring skills, highly structured learning format, regular weekly sessions, and lastly continual teacher support and feedback (Enright & Axelrod, 1995; Van Keer, 2004; Fantuzzo et al., 1992).

Table.1: Types / Models of Peer Tutoring.

TYPES / MODELS	DESCRIPTION
Class wide peer tutoring (CWPT)	Developed by Delquadri et al. in 1986 at the Juniper Gardens Project in Kansas City. Students in an entire class are paired into tutor-tutee dyads who work together on tasks

	structured by the teacher for 30 minutes per day. After 10 minutes of tutoring, roles are reversed. Each dyad is typically assigned to one of two competing teams to earn points for responding to the task, or for their role as tutor or tutee
Peer-assisted learning strategies (PALS)	A modified version of CWPT developed by Fuchs et al (1997). Pupils are divided into higher ability and lower ability pairings. In PALS Reading the pupils take turns to read with the stronger reader going first. The steps for PALS Reading include partner reading, paragraph shrinking, prediction relay and retelling. PALS Maths includes two procedures of coaching and practice.
Reciprocal peer tutoring (reverse role tutoring)	Originally developed for pairs of low-achieving urban elementary school students by Fantuzzo et al (1992). A collaborative learning strategy in which students alternate between the role of tutor and tutee. RPT combines same age pairs of similar ability and utilises self-management methods and group interdependent reward contingencies to promote academic and social competency.
Cross-age peer tutoring	The tutor-tutee dyads are students of different ages and grades. Older students in higher grades are matched with younger students in lower grades.

Benefits of Peer Tutoring.

Currently, there is sufficient research that documents the benefits of peer tutoring as a supplement to traditional instruction. Peer tutoring has been used across academic subjects, and has been found to result in improvement in academic achievement for a diversity of learners within a wide range of content areas [12-14]. Common components of peer tutoring programs facilitate both cognitive and social gains in both higher performing mentors and low performing mentees in an individualised and positive way.

Academic and Cognitive Gains through Peer Tutoring:

Positively affects mathematics performance [Greenwood and Delquadri,1995; Kunsch, Jitendra, and Sood, 2007). Overall, peer tutoring in mathematics is most effective in improving mathematics performance for students at risk for or experiencing mathematics disabilities, elementary aged participants, and mathematics computation content (Kunsch, Jitendra & Sood, 2007).

- Improves reading achievement for students of all levels (Scruggs, Mastropieri & Marshak, 2012; Miller, Topping and Thurston 2010).

Some established positive outcomes of peer tutoring in reading classes include improvements in key reading skills as well as gains in self concept and competency in reading (Miller, Topping and Thurston 2010). Results from a study of peer tutoring reading programs in middle schools indicated that students' oral reading rate increased following peer tutoring programs.

- Accommodates diverse students within a classroom (Scruggs, Mastropieri & Marshak, 2012)

Inclusive learning, which is the practice of teaching disabled students alongside non-disabled peers in regular classroom settings, can be facilitated through an emphasis on differentiated learning, where students of varying academic levels receive instruction appropriate for their individual learning styles and speeds (Scruggs, Mastropieri & Marshak, 2012) Differentiated learning, which emphasizes providing students with varied opportunities to acquire knowledge and master skills, can be difficult to implement in a traditional classroom setting (Scruggs, Mastropieri & Marshak, 2012). Peer tutoring can be an effective strategy for educators to facilitate differentiated learning without stigmatizing and alienating students. When peer tutoring is implemented in a class wide setting, students are able to approach the curriculum at their individual learning level, using strategies tailored to individual mentees (Kamps, et al. 2008).

- ❖ Promotes higher order thinking (King, 1997).

By explaining concepts in detail, high level questioning, and the use of supportive communication skills, peer tutors can help low performing students master material previously introduced in a traditional classroom setting and build on their knowledge using higher ordering thinking skills (King, 1997).

Social and Behavioral Gains through Peer Tutoring:

Results in positive effects on social, self concept, and behavioral outcomes (Fuchs, Fuchs & Burish, 2000; Ginsburg-Block, Rohrbeck & Fantuzzo, 2006; Bowman-Perrott, 2009; Leasher D. C. & Ortega-Medina, 2007; Sideridis, et al.1997). Social, self concept and behavioral outcomes were affected positively with the use of peer assisted learning strategies, including peer tutoring. Additionally, researchers found a significant positive relationship between social and self concept outcomes and academic achievement. Decreases in disruptive behavior (Leasher Dennis, Canas, & Ortega-Medina, 2007) and improvement in social interactions among culturally and developmentally diverse peers are also noted outcomes of peer tutoring programs (Ginsburg-Block, Rohrbeck & Fantuzzo, 2006).

- ➢ Increases students' sense of control and responsibility for their academic achievement [(King, 1997; Mitchem, 2001).

Peer tutoring increases students' sense of internal responsibility for their achievement (King, 1997). Peer tutoring programs have also been shown to improve student's ability to accept constructive feedback from adults (Mitchem, 2001). Training students in peer tutoring strategies can help students take responsibility for their learning, and their ability to recognize and accept responsibility for academic failures.

Theoretical advantages of peer tutoring.

The cognitive processes involved in peer tutoring have been explored by various writers over the years, many of whom emphasised the value of the inherent verbalisation and questioning (e.g. Gartner, Kohler and Riessman 1971, Durling and Schick 1976, Bargh and Schul 1980, Webb 1982, Foot, Shute, Morgan and Barron 1990, Forman 1994). A neo-Piagetian interpretation of individual development through the cognitive conflict and challenge 324 involved in many forms of peer assisted learning is offered by Doise and Mugny (1984). However, peer tutoring is more fully understood through the social interactionist (or socio-cultural or social

constructivist) view of cognitive development. Supported (or 'scaffolded') exploration through social and cognitive interaction with a more experienced peer in relation to a task of a level of difficulty within the tutee's 'zone of proximal development' remains a theoretical cornerstone of peer assisted learning (Vygotsky 1978). This theme has been further developed by Barbara Rogoff (1990) under the label of 'apprenticeship in thinking'.

Peer tutoring is often promoted on the grounds that, for the tutors, it is 'Learning by Teaching'. This view is expanded in the old saying 'to teach is to learn twice'. Sternberg's (1985) theory of intelligent performance identifies components which might be enhanced during peer tutoring (Hartman 1990): the meta-cognitive skills of planning, monitoring and evaluating and the associated use of declarative, procedural and contextual knowledge; and the cognitive processes of perceiving, differentiating, selecting, storing, inferring, applying, combining, justifying and responding. Just preparing to be a peer tutor has been proposed to enhance cognitive processing in the tutor by increasing attention to and motivation for the task, and necessitating review of existing knowledge and skills. Consequently, existing knowledge is transformed by reorganisation, involving new associations and a new integration. The act of tutoring itself involves further cognitive challenge, particularly with respect to simplification, clarification and exemplification.

An excellent study by Annis (1983) compared three randomly allocated groups of students: one which merely read the material to be studied, one which read the material in the expectation of having to teach it to a peer, and a third which read the material with the expectation of teaching it to a peer and then actually carried this out. On a 48 item test of both specific and general competence, the 'read only' group gained less than the 'read to teach' group which in turn gained less than the 'read and teach' group. The tutors gained more than the tutees. A similar study by Benware and Deci (1984) compared the relative effectiveness of reading to learn for a test and reading for learning to teach a peer. Subjects were randomly assigned to conditions and the outcome measure was a 24 item test of both rote memory and conceptual understanding. While both groups performed equally well on rote learning, the 'learn to teach' group performed better on higher order conceptual understanding, and on a questionnaire regarding motivation and learning perceived their experience as more active and interesting.

Many other advantages have been claimed for peer tutoring and related forms of peer assisted learning (e.g. Greenwood, Carta and Kamps 1990). Pedagogical advantages for the tutee include more active, interactive and participative learning, immediate feedback, swift prompting, lowered anxiety with correspondingly higher self disclosure, and greater student ownership of the learning process. The 'pupil/teacher' ratio is much reduced and engaged time on task increased. Opportunities to respond are high, and opportunities to make errors and be corrected similarly high. In addition to immediate cognitive gains, improved retention, greater meta-cognitive awareness and better application of knowledge and skills to new situations have been claimed. Motivational and attitudinal gains can include greater commitment, self-esteem, self-confidence and empathy with others. Much of this links with work on self-efficacy and motivated learning (Schunk, 1987), leading to the self-regulation of learning and performance (Schunk & Zimmermann, 1994). Modelling and attributional feedback are important here perhaps peer tutoring can go some way towards combating the

dependency culture associated with superficial learning. From a social psychological viewpoint, social isolation might be reduced, the functionality of the subject modelled, and aspirations rose, while combating any excess of individualistic competition between students. Moust and Schmidt (1994a) found that students felt peer tutors were better than staff tutors at understanding their problems, were more interested in their lives and personalities, and were less authoritarian, yet more focused on assessment. Economic advantages might include the possibility of teaching more students more effectively, freeing staff time for other purposes. Politically, peer tutoring delegates the management of learning to the learners in a democratic way, seeks to empower students rather than de-skill them by dependency on imitation of a master culture, and might reduce student dissatisfaction and unrest.

Peer tutoring can have disadvantages, however (Greenwood et al. 1990). Establishing it does consume organisational time in designing and effecting appropriate peer selection and matching, and it may also necessitate some adaptation to curriculum materials. Certainly the requirements for training students in teaching and learning skills are greater, although it can be argued that peer tutoring merely serves to bring to the surface needs that traditional teaching tends to overlook. All these may involve increased costs in the short term, with a view to reduced costs and/or greater effectiveness in the medium and long term. The quality of tutoring from a peer tutor may be a good deal inferior to that from a professional teacher (although this should not be assumed), and the need for monitoring and quality control cannot be overstated. This also significantly consumes time and resources. Likewise, the tutor's mastery of the content of tutoring is likely to be less than that of a professional teacher, so curriculum content coverage in peer tutoring may be much more variable. For these reasons, project coordinators may experiment 326 initially with peer tutoring for consolidation and practice, rather than the first learning of new material, utilising it on a small scale with suitable topics.

Research on peer tutoring in schools.

A recent review (Topping 1992) identified 28 previous reviews and meta-analyses of research on peer tutoring, mostly in schools. Sharpley and Sharpley (1981) conducted a meta-analysis of 82 studies in schools, reporting substantial cognitive gains for both tutees and tutors. Same-age tutoring appeared as effective as cross-age tutoring, and training of tutors significantly improved eventual outcomes. Cohen, Kulik and Kulik (1982) discovered 500 titles relating to tutoring. In 65 studies with control groups, tutored students out-performed controls in 45. There was again evidence that tutor training produced larger sizes of experimental effect. Highly structured tutoring was also associated with larger effect sizes. There was evidence that peer tutoring improved tutee attitudes in class, as well as tutee self-concept. In 38 control group studies measuring tutor achievement, tutors out-performed controls in 33. Improved tutor attitudes and self-concept were also reported.

There is thus substantial evidence that peer tutoring is effective in schools. Beyond this, relative cost-effectiveness may also be considered. Levin, Glass and Meister (1987) conducted a cost-effectiveness analysis of four different interventions designed to improve reading and mathematics in primary schools (elementary schools) in the USA: computer assisted learning, reducing class size, lengthening the school day, and cross-age peer tutoring. The most cost-effective intervention (peer tutoring) was four

times more cost- effective than the least. The least cost-effective was reducing class size. While evidence concerning peer tutoring in schools can certainly not be automatically generalised into higher and further education, there is considerable food for thought in these findings.

Peer tutoring in higher education – previous reviews.

Previous reviews and surveys of peer tutoring in higher and further education include those of Goldschmid and Goldschmid (1976), Cornwall (1979), Whitman (1988), Lee (1988), Lawson (1989), Maxwell (1990) and Moore-West, Hennessy, Meilman, and O'Donnell (1990). All of these are interesting, but the earlier papers were completed at a time when most of the literature was descriptive in nature. The Goldschmids' own empirical work (1976) was well before its time in this respect. Cornwall (1979) offered a wide ranging overview of the field, including advice on organisation and problem solving. In a survey of 93 colleges, Lee (1988) made a comparative analysis of seven different kinds of programmes targeted on increasing retention and reducing student dropout. Programmes involving peers as resources showed up particularly well. The most expensive programmes were not more effective than cheaper ones and size of institution was not a factor in retention and dropout rates. Peer tutoring and peer counselling both showed good costeffectiveness, while traditional remedial programmes proved very cost-ineffective. Lawson (1989) surveyed 19 colleges and universities in Canada identified as having peer assisted learning programmes. Peer tutoring was found to be more common than peer counselling. Detailed descriptions of goals, selection, training, logistics and methods for evaluation of programmes are given, but little hard data on comparative effectiveness and costeffectiveness. Peer assisted learning programmes in United States medical schools were surveyed by Moore-West et al. (1990). Of 127 colleges in an association, 62 replied, and of these 47 had peer tutoring programmes, while 40 had 'advising programmes' and 13 had 'peer assessment programmes'.

Cross-year small-group tutoring.

In this review of the more recent substantive literature on different forms of peer tutoring, the format most like surrogate professional teaching will be considered first. This is where upper year undergraduates (or post-graduates) act as tutors to lower year undergraduates, each tutor dealing with a small group of tutees simultaneously. The literature search revealed 18 studies of note (Bobko 1984, Meredith and Schmitz 1986, Cone 1988, Moust, De Voider and Nuy 1989, Button, Sims and White 1990, House and Wohlt 1990, Lidren, Meier and Brigham 1991, Longuevan and Shoemaker 1991, Moust and Schmidt 1992, 1994b, Johansen, Martenson and Bircher 1992, Ameman and Prosser 1993, Johnston 1993, American River College 1993, McDonnell 1994, Moody and McCrae 1994, Mallatrat 1994 and Schmidt, Arend, Kokx and Boon 1994.) Many of these gathered only subjective feedback outcome data. Of eleven studies doing this, nine reported very positive outcomes, one noted outcomes as good as those from teaching by professional faculty, and one reported less good outcomes than for professional faculty. Three studies reported reduced dropout in association with such tutoring. Five studies reported improved academic achievement, another four reported academic achievement as good as that from professional teaching and one reported achievement slightly but significantly worse than that. Much of the research is not of the highest quality, but good quality studies

(e.g. Lidren 1991 and American River College 1993) do clearly demonstrate improved academic achievement.

In Bobko's (1984) study, the peer tutors had groups of 25 tutees for 12 hours per week. Course grades did not show a significant improvement over previous years, but previous groups may not have been comparable. Interviews with tutees yielded many reports of increased confidence and less anxiety, while tutors reported improvements in their knowledge and ability to communicate. Meredith and Schmitz (1986) reported a study involving many subjective ratings, and although some favoured peer tutoring compared to faculty tutoring, others indicated the opposite, and a great many were not significantly different. A mixed method project reported by Cone (1988) involved rotating recitation and testing between same-year peers with coaching and testing by cross-year peer teaching assistants. Tutoring objectives and materials were highly structured. Outcomes on test were markedly higher than normal expectations, but the lack of proper control groups and the absence of information about assignation to groups limit the conclusions that might be drawn.

A comparative study by Moust et al. (1989) in law included process measures which indicated that student tutor behaviours were very similar to those of professional faculty. Nevertheless, on outcome test scores the faculty tutored students scored higher than those tutored by peers. Button et al. (1990) reported cross-year tutoring (which they termed 'proctoring') in mechanical engineering and computing in relation to specific design projects. The subjective feedback from the vast majority of tutors and tutees was very positive. House and Wohlt (1990) compared achievement outcomes on Grade Point Averages for peer tutored and non-tutored students. Male peer tutored students achieved higher GPA's than non-tutored, but female tutees did not. The subjects were self selected into groups and the outcome measure was very general and probably insensitive to small scale intervention effects. Student drop-out also improved. A better quality study by Lidren et al. (1991) used randomized control groups and compared outcomes for peer tutored groups of six with groups of twenty. Both groups performed better academically in terms of examination results and positive subjective feedback than non-tutored students. The smaller peer tutored groups yielded better outcomes than the larger ones.

Longuevan and Shoemaker (1991) deployed upper year students and clerical staff as volunteer tutors. The tutors were required to attend the same lectures as the tutees prior to giving tutorial assistance. This tutoring programme charged a fee to tutees and 10-15% of undergraduates in the institution participated. There was some evidence that larger amounts of tutoring resulted in higher Grade Point Averages, although the size of difference was small and its significance not easy to establish. Johansen et al. (1992) reported subjective feedback, with tutees mostly satisfied but tutors rather anxious. Ameman and Prosser (1993) studied peer tutoring in dentistry in Australia. Subjective feedback indicated confidence gains in tutors and tutees. Johnston (1993) deployed trainee teachers as tutors for economics students in 'micro learning groups' of four. Although subjective feedback was very positive, the examination and test results of participants and non-participants were not very different.

American River College (1993) deployed twenty-four paid 'learning assistants' for three hours per week with groups of two to six tutees. Tutees' subjective feedback was very positive, and tutors felt their own knowledge of their subject improved. Most

strikingly however, although tutees had lower general Grade Point Averages than non-tutored students, they scored as well or better than them in tutored subjects. In the area of computer science, McDonnell (1994) researched tutoring by third year students of small groups of up to four second year students, and reported very positive subjective feed- back. Moody and McCrae (1994) reported on cross-year tutoring in groups of six to fourteen in law. Subjective feedback from tutors was positive. Mallatratt (1994) targeted reduced dropout rate for a peer tutoring project in computing. Half the students utilised the scheme, a quarter regularly. Tutees reported finding the experience supportive and achieved improved grades compared to previous cohorts of students. Seven students reported that peer tutoring had been the critical factor in preventing them from leaving the course, and other subjective feedback was positive.

Moust and Schmidt (1992, 1994b) found student tutored and staff tutored groups gained equally in achievement during an eight-week problem based law course. Schmidt et al. (1994) compared the achievement of 334 peer tutored and 400 faculty tutored groups in a problem-based health sciences course. Overall, the latter achieved slightly but significantly better, but peer tutoring was equally beneficial in the first year of the course.

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