

Peer Tutoring in Higher Education: A Review of Empirical Research.

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Abstract

Peer tutoring is a pedagogical strategy that is purported to be beneficial to both the tutors and the tutees. In this paper, a systematic review of the literature on peer tutoring in higher education (primarily, colleges and universities) was conducted. This involved a comprehensive search of an electronic education research database for empirical studies on peer tutoring in higher education from 1997-2017. The aim is to determine the likely factors that influence peer tutoring effectiveness in higher education. The Attitude, Skill, Knowledge (ASK) peer tutoring model proposed by Fitch and Semb (1993) was employed for this purpose. Findings showed that attitude, skills and knowledge of the tutor affect learning outcomes in peer tutoring contexts as does the attitude of the tutee. These findings are juxtaposed in the framework of Piaget, Vygotsky and Bandura's learning theories with emphasis on self-reflection and self-efficacy in peer tutoring. This paper concludes with implications for practice.

Keywords: peer tutoring, higher education, tutor, tutee, Piaget, Vygotsky, Bandura

Peer Tutoring in Higher Education: A Review of Empirical Research.

“The beginnings of peer tutoring lie in practice, not in theory” (p. 87, Bruffee, 1995). The history of “older children instructing younger children”(p. 107) can be traced back to first century AD, under the Roman rhetorician, Quintilian; journeying thereafter through Spain and India in the 1700s to 1800s (Krouse, Gerber & Kauffman, 1981). It found formal institutional adoption in the nineteenth century as a matter of economic convenience for the working class populace in London (Fogarty & Wang, 1982). Laced with moral repudiation for lackluster academic performance, higher ranking students monitored their lower ranking peers under the overall supervision of the teacher. Tokens were used as reinforcements to order students through these ranks. This approach, known as the Lancasterian method, after its founding proponent Joseph Lancaster, achieved immediate mass popularity (Gerber & Kauffman, 1981). Seating preferences, classroom discourse and other pedagogical practices were filtered through the ranks which promoted a competitive rather than collaborative environment amongst peers. The popularity waned as later educational reforms morphed some of the punitive aspects of Lancaster towards a focus on mutual tutor-tutee learning outcomes.

By the early sixties, peer tutoring experienced a resurgence in Eastern, then Western Europe and further westwards until it began to make a dominant appearance in American schoolhouses. The Mobilization of Youth in New York City project was one of such early examples where younger students were tutored in reading by older ones to reported success (Ehly & Larsen, 1976). However, literary discourse prior to the 1980’s did not reflect these developments; it was still focused on the study of student-teacher relationships, specifically providing instructional guidance on teacher interactions with students (Johnson, 1981).

Citing a need for more student-student empirical research, Hanser (1982) studied the dynamics of peer approval and disapproval in a musical classroom. It was discovered then that “...only subjects who received high rates of approval from fellow subjects improved to any degree from pretest and posttest” (p. 226). This indicated a strong correlation between peer behavior and academic performance. Educators’ view of students gradually began to evolve from seeing them solely as recipients of instruction to potent pedagogical change agents (Fogarty & Wang, 1982). Several more observations were drawn on the impacts of peer relationships on students’ wellbeing. According to Johnson (1981), peer relationships could;

- (a) influence educational aspirations and achievement
- (b) inspire openness to divergent values, attitudes and ways of perceiving the world.
- (c) teach students the social competencies necessary to reduce social isolation

Whitman and Fife (1988) classified these peer relationships into two broad types; near-peer and co-peer. Near-peer refers to a dynamic where there is a considerable knowledge gap between the students whilst co-peer relationships occur within students of similar knowledge levels. In higher education, undergraduate teaching assistants, tutors and counselors would be considered near-peers. Partnerships and work groups are co-peers. Peer tutoring, simplified for its purpose here, explores both near-peer and co-peer relationships where one student offers short-term instructional assistance to another student. This, now familial practice in education is considered here from a student-centered purview. A justification for this study is provided on the heels of other well-versed reviews. The results are presented via the ASK peer tutoring model (Fitch & Semb, 1993). Findings are subsequently discussed in light of their theoretical antecedents; Piaget, Vygotsky and Bandura’s perspectives.

Literature Review

Over the last few decades, several literature reviews and meta-analyses have been conducted in the field of peer learning, education and assessment. This section discusses some of the pertinent ones and identifies the gaps that necessitated this effort.

Secomb (2008) conducted a review of peer teaching in undergraduate health education of publications from 1980 to 2005; it uncovered some positive impacts which includes the improvement of students' confidence in clinical practice. A subsequent review, also in the medical field, spanned peer assisted learning in general (training, teaching and assessment) and ascertained the previous findings (Burgess, McGregor & Mellis, 2014). However, a related meta-analysis of 10 studies in undergraduate medical education revealed no significant differences between peer-teaching and faculty teaching (Rees, Quinn, Davies & Fotheringham, 2016).

When Osguthorpe and Scruggs (1986) investigated peer tutoring in special education, they discovered that handicapped/remedial students can be trained to be tutors themselves; a role in which they were as much personal/social beneficiaries as those whom they tutored. Similar results were reported amongst students with mild disabilities (Stenhoff & Lignugaris/Kraft, 2007). They also observed therein, that the degree of training the tutors received significantly influenced tutee learning outcomes. A more recent study by Bowman-Perrott, Davis, Vannest, Williams, Greenwood and Parker (2013) focused on single-case research experiments for the K-12 group. They found peer tutoring to be immensely effective across different grade levels, competences and content areas; but more so, for socially disabled students. Maheady, Harper and Mallette (1991) discussed the instructional approaches, merits and concerns of employing peer-mediated instruction in special education classrooms.

These accounts of peer tutoring offer up niche perspectives on the status of peer tutoring in medical and special education. Others reveal important gaps. For instance, though Rohrbeck, Ginsburg-Block, Fantuzzo and Miller's (2003) meta-analytic review identified peer tutoring to be an effective intervention strategy with young, urban, low-income and minority students; it also revealed that many of the examined studies were missing descriptive demographic information. More comprehensive reviews have been conducted. Topping (1996) synthesized much of the literature on the effectiveness of peer tutoring in higher education prior to 1997, documenting a working definition and typology. In an extended review of literature up till 2006, he offers an integrated theoretical model of peer learning; opining that despite the well-documented benefits of peer learning, it was an under-theorized field (Topping, 2005).

This effort here builds upon the previous reviews two-fold. First, it constitutes the inclusion of more up to date literature, 1997 - 2017, on peer tutoring in higher education. And secondly, it extrapolates the theoretical underpinnings of the operational aspects of peer tutoring. There are related reviews that approach this topic similarly. Stigmar (2016) tackles the first account with its recency. Ward, Lee and Lee's (2005) theoretical leanings mirrors the second. However, Stigmar (2016) reports mostly descriptive statistics such as regions where the studies were conducted, disciplines covered and oft preferred research methodology. In addition, previously documented benefits of peer tutoring on improving critical thinking, collaboration and communication skills of students, are reiterated. On the other hand, Ward, Lee and Lee (2005) studied peer influences in physical education from the analytical view of Piaget's equilibration theory, Vygotsky's sociocultural theory and Skinner's behavior analytic theory. The study here offers both theoretical and empirical perspectives. It also unveils other contexts that were not explicitly mentioned in the others.

Research Motivation

Peer tutoring is becoming popular as focus shifts from traditional didactic lecturing approach to more collaborative strategies. When viewed as a social context for collaborative learning, peer tutoring appears less a mediative intervention and seems simply attuned to the norms of academic life. In a sense, it reinforces one's natural propensities to socialize, belong and be part of a group of peers or likeminded individuals, also known as a community of practice. In another, it eschews self-oriented learning tendencies. As Knox (1980) notes "adults who actively seek to enhance proficiencies tend to see themselves as users of, rather than recipients of, education" (p. 79). Academia is one arena where peer tutoring is beneficial for immediate compensation in the form of achieving learning outcomes. The non-academic skills developed however remain relevant in later professional life successes where collaboration is vital.

Research Questions

In light of the information presented, the research questions and model for interpreting the findings follows. This research is stemmed from admitting that indeed peer tutoring works, many more times than not; but there are some unaddressed concerns regarding the nuances. This study attempts to address this by investigating this research question; what factors have been shown to influence the effectiveness of peer tutoring in higher education?

The Attitude-Skills-Knowledge (ASK) model of tutoring is the analytical tool. Fitch and Semb (1993) posit that effective tutoring is characterized by;

- attitude: the tutor must be approachable and have a positive attitude towards teaching

- skills: the tutor must have good communication skills such as listening, asking questions and providing feedback
- knowledge: the tutor must have a good command of the subject matter

It is hypothesized here that tutors in effective peer tutoring programs exhibit these characteristics. This model will also be extended to explore the reciprocal ASK characterization for tutees in the same programs. The knowledge obtained from the findings will improve the practice of peer tutoring. Educators will be better informed about creating contexts for effective peer tutoring to occur.

Research Methodology

To address the highlighted research concerns, a systematic literature review methodology was employed. A search of the electronic database Education Resources Information Center (ERIC) was conducted using the keywords ‘peer tutoring’ for articles published between 1997 and 2017. The search options ‘peer-reviewed only’ and ‘full text available on eric’ were selected. Additional filtering options restricted the articles by publication type and education level, to journal and higher education articles, respectively.

The inclusion criteria maintained that the articles must be empirical studies where mention of peer tutoring (or its variant) is explicit in the abstract/keywords or otherwise introduction/conclusion sections. Participants must include student tutors/tutees in higher education and findings are expected to be student-centered. Review or opinion articles were excluded.

For each identified study, the basic background information about the paper is gathered; geographical region, discipline and publication year. This forms the descriptive statistics of the review. The findings in the body of the research are then analyzed with the ASK model (Fitch & Semb, 1993). Further, the theoretical underpinnings of these findings are synthesized in the frameworks of Piaget, Vygotsky and Bandura. Recommendations for applying these findings are also suggested.

Results

A total of 63 articles were returned from the initial search and filtering process on the electronic database (<http://www.eric.ed.gov>) as at the time it was conducted, march 2018. Certain articles that bypassed the search criteria due to systemic errors were identified; 30 articles were excluded for not belonging to higher education and/or being empirical studies. When the inclusion criteria was applied on the remainder 33 articles, it was discovered that 4 more articles did not emphasize student-centered findings in their results. The final result is 29 empirical studies of peer tutoring in higher education that were reviewed in this study. These are listed in Table 1.0 in no particular order.

Ciscell, Foley, Howe and Gjosedal (2016)	Kieran and O'Neill (2009)	Yurt and Aktas (2016)
Bell, Arnold and Haddock (2009)	Bell and Elledge (2008)	Arendale (2014)
Marx, Wolf and Howard (2016)	Alrajhi and Aldahfri (2015)	Cooper (2010)
Townsend, Delves, Kidd and Figg (2011)	Rae and Baillie (2009)	Michael (2016)
Baek, Yoo, Lee, Jung and Baek (2017)	Outhred and Chester (2010)	Lelis (2017)
Linda, Thespiso and Andrew (2017)	Zamberlan and Wilson (2015)	Martin (2015)
Grinnell, Muise and Litvin (2009)	Walvoord and Pleitz (2016)	Sanford (2012)

García, Morales and Rivera (2014)	Lueg annd Lueg (2014)	Al Kharusi (2016)
O'Brien, Freud and Sinanan (2014)	Johnson and Galluzzo (2014)	Lin and Yang (2013)
Zamberlan and Wilson (2017)	Gerhardt and Olan (2010)	

Table 1.0: Empirical studies in higher education from 1997 - 2017

Descriptive Statistics

The descriptive statistics are presented by the discipline of the study, the region where it was conducted and the publication year

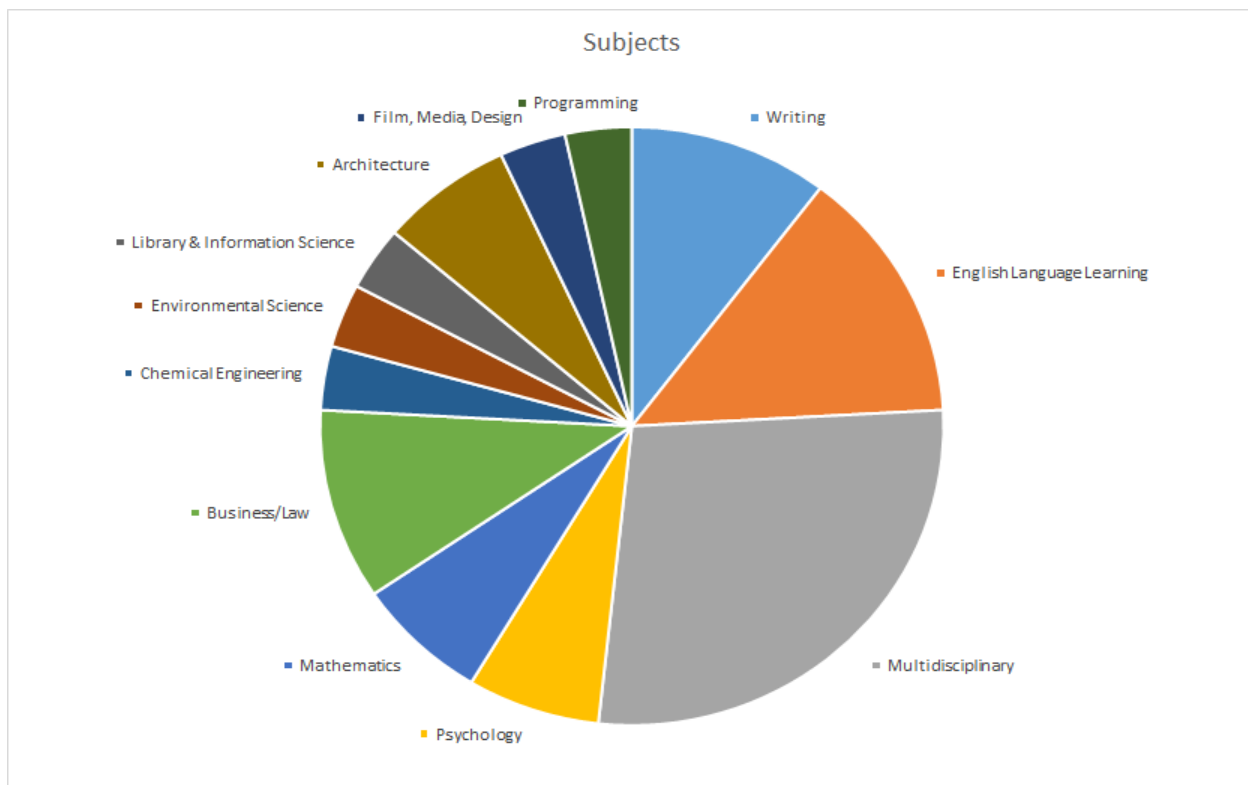


Fig 1.1: Empirical studies by discipline

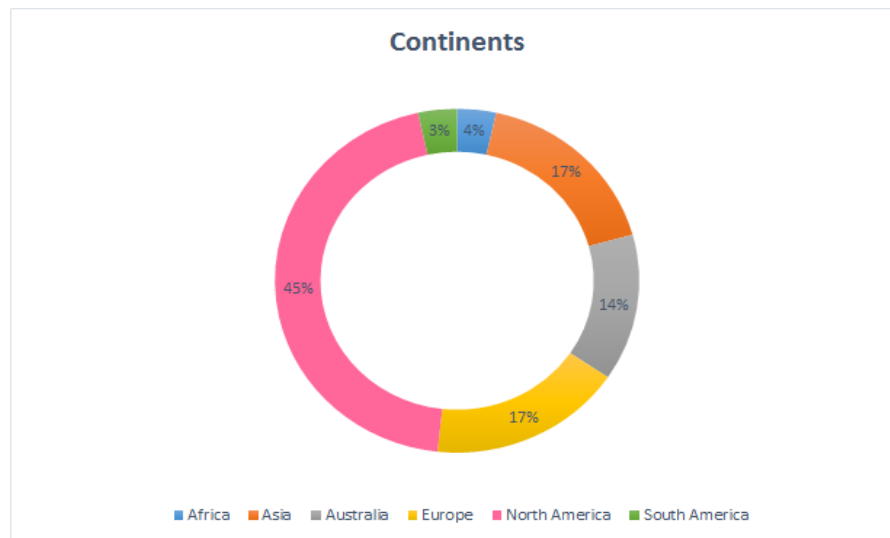


Fig 1.2: Empirical studies by region

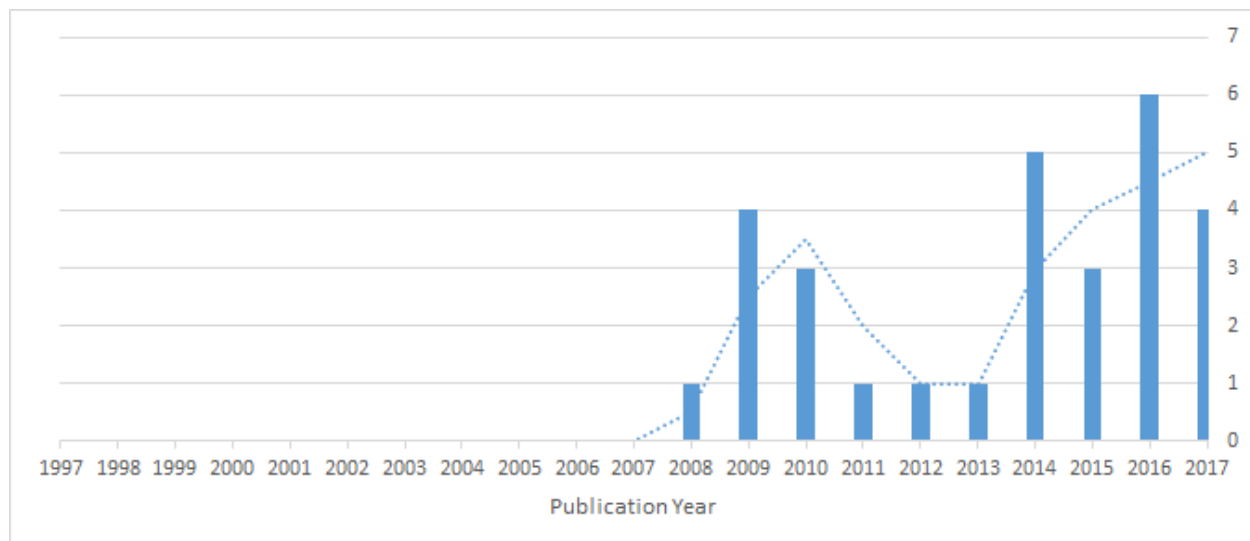


Fig 1.3: Empirical studies by year

Findings show that all disciplines are equally represented. Most of the reviewed studies emanate from North America. In a distant second is Asia, Australia and Europe, trailing at a 50% marginal difference. African and South American representation is negligible. For the yearly distribution, no study was accounted for from 1997 to 2007. From 2008 to 2017, the number of studies rises, falls, then rises again, peaking in 2016.

ASK Model Analysis

The synthesized details of the findings are presented for both the tutor and tutee.

ASK: Tutor

The findings showed that some tutors initially doubted their own competencies (O'Brien, Freud & Sinanan, 2014). Even though tutors needed to be knowledgeable about the subject matter their roles often involved offering moral/non-academic support to struggling students (Linda, Tshepiso & Andrew, 2017). The ones who were effective demonstrated a combination of commitment, tutoring experience, good communication skills, empathy, personality match with tutee and enthusiasm for tutoring (Townsend, Delves, Kidd & Figg, 2011; O'Brien et. al, 2014). The tutors with poor interpersonal skills received the lowest ratings in the feedback from their peers (Johnson & Galluzzo, 2014). In effective peer tutoring programs, tutors skills improved in problem solving, punctuality, understanding of subject matter and sharpened personalities (Al Kharusi, 2016).

ASK: Tutee

The research showed that frequent users of peer tutoring programs were already high achieving students (Walvoord & Pleitz, 2016). Ciscell, Foley, Howe and Gjosedal (2016) concurred, adding that the students who struggled the most academically were the least likely to seek help. In part this is because students in academic danger have negative self-imposed views of themselves and feel shame/stigma prohibiting from seeking help for peer tutoring. On a positive note, peer tutoring was shown to positively influence the tutees' self-concept (Alrajhi & Aldahfi, 2015) and self-efficacious learning skills (Michael, 2016). Academically, it also improved tutees self-confidence in tackling difficult problem sets (Kieran & O'Neill, 2009; Johnson & Galluzzo, 2014). Non-academic skills like communication and knowledge mediation

also improved in groups where peer tutoring was applied (Lueg & Lueg, 2014; Yurt & Aktas, 2016).

ASK: Tutor-Tutee relationship

Tutees indicated that they wanted to belong or fit in. Tutors also expressed similar sentiments, that it was important to have an authentic connection with the tutee for a successful tutoring relationship (Linda, Tshepiso & Andrew, 2017). Hence, tutees are likely to book the same tutor over and over again if they have developed a friendship with him or her (Al Kharusi, 2016). This positive tutor-tutee relationship and high levels of peer engagement are important because they are positively correlated to tutoring success (Michael, 2016). A sustained, healthy, positive and trusting relationship between tutor and tutee opened up more channels of communication which led to improved study skills directly and improvement of grades indirectly (Marx, Wolf & Howard, 2016; García, Morales & Rivera, 2014; Arendale, 2014). In some cases, bidirectional learning occurred (Lin & Yang, 2013)

Discussion

The interpretation of the findings covers both the anticipated and unanticipated research concerns; the latter first. A broad variety of tutoring contexts were covered:

- Locations: Classroom, tutoring centers, writing centers, online and library were the most frequented locations
- Group dynamics: The one-to-one, one-to-many and many-many, tutor-to-tutee matching was observed.
- Both near-peer and co-peer relationships were reviewed, and they were represented in equivalent proportion.

- Prescheduled appointments and walk-in tutoring sessions were accounted for.
- Also, instances of periodically reoccurring and one-off tutoring were recorded
- Some peer tutoring activities were mandated by the instructor and others were voluntary services offered by the school

There is very little research on peer tutoring amongst graduate students as evidenced in this review. Most graduate students were employed in the role of tutors and only one reviewed study indicated having the graduate students in a tutee role. Peer tutoring adoption was low in a study of MA students in the school Media, Film and Design (Lelis, 2017). They were graduate students without more advanced peers to work with. For this reason, they reckoned that their same-year peers will be at similar knowledge levels. The resultant anticipation of negligible learning outcomes was a self-fulfilling prophecy in this study.

On the same note, majority of the studies were reported amongst undergraduate students, primarily freshmen. They did find it effective unlike the singular aforementioned graduate case. The study by Cooper (2010) reports that “students who visited the TC more than 10 times per quarter had approximately 10% higher rates of persistence and approximately 0.2 points higher average GPAs than students who infrequently visited or who do not visit the TC during their first year of college” (p. 21). They may also need it more; freshmen are just transitioning from high school and it is likely that they are not yet familiar with deeper learning skills that go beyond regurgitating information (Zamberlan & Wilson, 2015).

Volition plays an important role in peer tutoring effectiveness. Where the choice to undergo peer tutoring is not made by the participants e.g. as an assigned percentage of course credit, the learning motivation is at risk. Lueg and Lueg (2014) found that some students did not like the mandated in-class peer tutoring and found it to be more time consuming than traditional

lecture/note-taking. The learning outcomes were also affected in such contexts; the weaker students relied on the higher performing students to pass the course. But this is not in the best interest of the student. Peer tutoring is intended as an intermediary recourse/measure; the goal is not for the tutee to be permanently dependent on the tutor (Arendale, 2014).

These discussions illuminates several points about the effectiveness of peer tutoring in higher education. At this point, substantial data has been elicited from which inferences can be drawn about the research question and hypothesis. The reviewed studies have shown that tutor attitude, skill and knowledge is correlated to effectiveness in peer tutoring. A positive disposition, tutoring ability and subject matter expertise will positively influence learning outcomes. For the tutee, there is an overarching emphasis on his/her active role in the peer tutoring process. The ASK purview of the tutee from the reviewed studies tilts heavily towards the 'attitude' component. A self-efficacious attitude is a tutee prerequisite for achieving learning outcomes. For both tutor and tutee, the dynamic of social interactions and self-reflections are also beneficial. The following theoretical analysis of peer tutoring expounds these precepts.

Theoretical Considerations

Piaget's theory focuses on childhood cognitive development in general and not just explicitly on learning (Piaget, 1958). But considering that learning is inextricably linked to cognitive development, the inclusion of Piaget's theory here is apropos. The theory holds that children develop an understanding of the world around them that is consequent on self-reflection of existing mental models and the new information they perceive from their external environment. This process consists of;

- *assimilation*, exposure to new information,
- *accommodation*, identifying discrepancy between the known and new information
- *equilibration*, steady progression towards knowledge mastery (Wadsworth, 2004)

A key criticism of the Piagetian perspective is that it neglects the role of the social environment and associated interactions on cognitive development. For this reason, it's often presented in literary discourse as a contrarian position to his contemporary, Vygotsky's work.

In Vygotsky's sociocultural theory of learning, he enthuses that a child can do much more with guided help than he/she can do alone (Vygotsky, 1987). This competency gap between what a child can do unaided and with help is known as the Zone of Proximal Development (ZPD). This gap can be narrowed through scaffolding which "...is an interactive process by which learners come to perform a task beyond their initial ability" (p. 13, Fitch & Semb, 1993). In a school environment, this can result from a student-teacher relationship which is mostly outside individual volition or a student-student relationship which is often self-selected. Peers can relate with and support each other due to their social and sometimes cultural similarities.

The purview herein is that both Piaget and Vygotsky's theories are not mutually exclusive where peer tutoring is concerned. Social learning is essentially learning together; that is, from and/or with one another. This is a notion that both theorists recognize in their work with children. The distinctions in their approaches largely stem from the precedence in which the social learning events occur. Piaget holds that children construct knowledge on their own which they then bring to the social environment. Vygotsky dissents noting that children construct their knowledge with others within the social environment. The obvious interpretation is to reckon

that Piaget's stance is *anti* social learning and Vygotsky's is *pro* social learning. However, there are some overlaps that may not be initially apparent.

These begin in noting that Vygotsky and Piaget were building their body of research at the same time, though independently and in vastly different cultural settings. Both used children as the focus of their study. Further, the initial (modeling) phase of Piaget's work was actually observing these children in social situations. And though his later conclusions will highlight the autonomous construction of knowledge in children, his earlier works accounted for a substantial role of peers in childhood learning (Golbeck, 2014). Also on a related note, Vygotsky's oft lauded ZPD was a part but not the focus of his vast work on sociocultural influences (persons, places, things) on cognitive development. He also admitted some of the inherent constraints on the applications to learning; "What collaboration contributes to the child's performance is restricted to limits which are determined by the state of his development and his intellectual potential" (p. 209, Vygotsky, 1987). This caveat has Piagetian leanings. The comparisons here are constrained to Piaget's early work and a subset of Vygotsky's work; drawing these parallels sets the tone for the interspersed work as it relates to peer tutoring.

The tutoring process requires that both tutor and tutee reflect on how they learn, if not actively on their own, at least passively in the course of their interactions. For the tutor, reflecting on his/her existing knowledge as he/she teaches or prior to, improves understanding of the knowledge. The tutee also has to reflect on what he/she knows and the information received from the tutor. This step is necessary because consequent on this reflection is the momentum for continued interest and engagement in tutoring. As the tutor and tutee interact, one with the other, the tutee may encounter cognitive conflict which Piaget posits in his assimilation, accommodation, and equilibration model. Unconfronted conflict can lead to frustration and

actually deter the learning experience for the tutee. But this conflict could develop into a positive learning experience with the guided help of the tutor (Piaget, 1958). This series of internal self-reflections in the tutoring process are all marked with a Piagetian approach. Where mutual interactions shape the knowledge of the tutor and the tutee, knowledge can be said to have been co-constructed in line with Vygotskian sympathies (Hogan & Tudge 1999). This illustrates the actual symbiosis of Piagetian and Vygotskian concepts in a typical peer tutoring context.

The social cognitive theory of learning can be viewed as a natural progression on the theories of Piaget and Vygotsky. It is a revision on the original social learning theory which states that knowledge is obtained via an individual's reciprocal interaction with his environment. A key component of the revised theory is the emphasis on self-efficacy; one's perception of their abilities to achieve a goal (Bandura, 1977; Bandura, 1986). Oettingen (2005) surmised that self-efficacy can be improved by:

- *performance experiences*; “successes build a sense of self-efficacy; failures weaken it” (p. 149)
- *vicarious experience*; “the successes of similar others raise one's own sense of efficacy, whereas failures lead to lowered levels” (p. 150)
- *verbal persuasion*; competent, trustworthy, attractive and knowledgeable individuals can positively influence self-efficacy beliefs
- *physical and emotional reactions*; high emotional arousal is often associated with low self-efficacy

Performance experience is likely to affect the tutee in adverse ways. The existence of academic failure or wherewithal would have caused the tutee to need the tutoring experience. In such a case, there is already an initial poor self-efficacy on the part of the tutee prior to the

session. The review here revealed that the effectiveness of peer tutoring is limited by negative self-efficacy beliefs.

Verbal persuasion in particular is relevant in peer tutoring, since the tutoring activities rely on good communication skills for any meaningful learning to occur. Though it isn't the tutor's job to improve tutee self-efficacy, he or she should be so inclined (in attitude, skills and knowledge) since it can positively influence peer tutoring effectiveness.

Peers are made up of individuals who engage both their introspective and extrospective learning tendencies in tutoring situations. This section has offered theoretical perspectives to contextualize peer tutoring. The Piagetian and Vygotskian accounts are provided because understanding how individuals construct knowledge independently and collectively will aid dynamics of peer tutoring groups (Golbeck, 2014; Hogan & Tudge 1999). Bandura's theory was also considered because as this review has shown tutees active role in the peer tutoring process can lead to its effectiveness. And students who are self-efficacious about learning will seek effective contexts for that to happen (Schunk & Pajares, 2009)

Implications for practice

One perceived challenge was a poor on-campus awareness of the available peer tutoring programs. Some students come in to the tutoring center as part of a directive from their instructor (Sanford, 2012). Hence, peer tutoring awareness can be improved by announcing it in class and issuing regular reminders to students. Instructors can provide extra credit for attendance (Gerhardt & Olan, 2010). Alrajhi and Aldhafi (2015) add that peer tutoring should be included in a teacher's plan.

There is also need for mentoring/tutoring programs to have pedagogical structure (Townsend et. al, 2011). Zamberlan and Wilson (2015) decipher that training should be provided to tutors, their roles clarified and the need for providing tutee feedback emphasized.

Conclusion

This study has demonstrated the effectiveness of peer tutoring in higher education. Mutual academic and non-academic benefits exist for the tutor and tutee. For peer tutoring effectiveness to be maximized, the tutor must possess a positive attitude, adequate tutoring skills and know-how of the subject matter. The tutee with positive self-efficacy beliefs is more likely to achieve the intended tutoring outcomes.

Peer tutoring is often a student initiated, led and minded process. The downside to this is that peer interactions which resemble a friendship are also more likely to lack certain instructional competencies that teachers provide (Sarbin, 1976). As such, peer tutoring is better championed as a '*supplement to*' not a '*replacement for*' classroom teacher-led instruction.

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