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Effects of Self-Reflection on the Perceived Value of Peer Feedback in a Course Using Team-Based Learning

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EFFECTS OF SELF-REFLECTION ON THE PERCEIVED VALUE OF PEER FEEDBACK IN A COURSE USING TEAM-BASED LEARNING

by

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ABSTRACT

by
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Title: Effects of Self-Reflection on the Perceived Value of Peer Feedback in a Course Using Team-Based Learning (Under the direction of Dr. Michael Brooks)

This study aimed to examine four factors contributing to an understanding of the effect self-reflection has on students' valuation and confidence in peer assessment and how the type of learner affects those same factors. The type of learner was identified as either a high self-regulated learner or a low self-regulated learner through the Motivated Strategies for Learning Questionnaire. Despite the requirement of teaching and measuring soft skills in allied health, little research is available to direct best practice and protocol in teaching, measuring, and documenting these skills. Self-regulated learning served as the theoretical framework, and the sample for this experimental design were graduate physical therapy and speech-language pathology students. A 2 x 2 factorial between-groups ANOVA was conducted for each hypothesis. The dependent variables were the valuation of peer feedback quality as an instructional method, confidence in submitted feedback quality, confidence in the quality of received peer feedback, and the valuation of peer feedback as an important skill. No significant interaction between type of learner and participation in a guided self-reflection protocol on participants' valuation and belief in the peer feedback process existed for any of the four hypotheses. A

significant main effect of type of learner on confidence in own feedback and with participation in the guided self-reflection on the confidence in the quality of received peer feedback was found. Results may assist instructors in the allied health fields with deciding on peer feedback protocol and give validity to teaching soft skills such as self-reflection.

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CHAPTER I

INTRODUCTION

The understood goal of an educator is to create lifelong learners. College graduates need to continually add to their knowledge while adapting to new careers or increased expectations in an ever-changing work environment. Also, increasing knowledge and access to Internet-based information requires individuals to synthesize and analyze new information in their fields (Blumenstyk, 2015; Brown, Roediger, & McDaniel, 2014). According to a survey conducted in 2019 by the Bureau of Labor Statistics, an individual's average number of careers in a lifetime is 12. The need to retool into a new career is a reality in today's workforce, as evidenced by the increase in non-traditional students and high unemployment rates (U.S. Department of Education National Center for Education Statistics, 2012; U.S. Department of Labor, Bureau of Labor Statistics, 2019). Learners who graduate from college without sound learning skills could be disadvantaged in the workplace and have difficulty moving from one career to another or expanding knowledge in their chosen fields. College graduates need to be equipped for an ever-changing workforce.

Acquiring and synthesizing new information while engaging in interdisciplinary education and practices is essential for allied health professionals. Practitioners in the health professions face ever-increasing knowledge that must be learned and synthesized to conduct evidence-based clinical decisions. Also, collaborative practice is now a service

delivery method considered best practice and essential in the global health systems (World Health Organization, 2010). Healthcare practitioners collaborate with other professionals to deliver a team-oriented approach to patient care and are expected to do so with interoperability professionalism (Holtman, Frost, Hammer, McGuinn, & Nunez, 2011; Interprofessional Education Collaborative, 2016). In preparation for the allied health field's collaborative nature, allied health practitioners need to be equipped with critical thinking skills and synthesize constructive feedback and new information. Faculty in higher education are charged to create such learners.

College graduates need to be as marketable as possible when applying for positions in a competitive job market. Soft skills are rated as one of the essential employability characteristics sought after in the professional sector (Council on Academic Accreditation in Audiology and Speech-Language Pathology, 2020; Remedios, 2012; Succi & Canovi, 2020). Becoming proficient in providing and receiving peer assessment can improve soft skills such as communication, collaboration, and adaptability. Students may generalize the skills into other educational and professional settings with practice, exposure, and valuation of peer evaluation skills (Brooks & Ammons, 2003). Topping (2017) pointed out that learning how to give and receive feedback, discern helpful feedback, and effectively implement the feedback is a transferrable social skill linked to high self-regulation abilities (Nilson, 2013). Peer assessment provides a method for teaching and measuring competencies categorized as soft skills. Employability skills can be developed and generalized through practical training and peer assessment, closing the gap between academics and practice.

Another self-regulated skill associated with effective soft skills and self-learning is the practice of self-reflection. Self-reflection is essential in developing professional skills, academic outcomes, leadership development, and self-efficacy (Schon, 1983). Additionally, self-reflection is a skill that is valued across professions. Learners with high self-regulation levels use self-assessment and reflection to independently direct their learning by modifying learning strategies for better outcomes (Nilson, 2013). Self-reflection allows the learner to identify attributes, ability, or effort, explaining success or lack of success. The identification of the attribute then provides a means to alter learning strategies. The ability to self-direct one's learning provides the needed foundation on which lifelong learning is built.

Statement of the Problem

The purpose of this study was to research four factors that contribute to an understanding of the effect that self-reflection has on a students' valuation and confidence in peer assessment and how the type of learner affects those same factors. The type of learner was identified as either a high self-regulated learner (high SRL) or a low self-regulated learner (low SRL) through the Motivated Strategies for Learning Questionnaire (MSLQ) administration.

First, the purpose was to determine the effects by type of learner between those participating in a Kole's modified feedback protocol versus Kole's modified feedback protocol with a guided self-reflection component on their valuation of peer feedback quality as an instructional method as measured by the Beliefs about Peer Feedback Questionnaire (BPFQ) for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. The second purpose was to

determine the effects by type of learner between students participating in and not participating in a guided self-reflection protocol on their confidence in their submitted peer feedback quality as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. The third purpose was to determine the effects by type of learner between students participating in and not participating in a self-reflection protocol on their confidence in the quality of received peer feedback as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. The fourth and final purpose was to determine the effects by type of learner between students participating in and not participating in a self-reflection protocol on their valuation of peer feedback as an important skill as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas.

Background

Theoretical Framework: Self-Regulated Learning Theory

Self-regulated learning is a well-studied, holistic, conceptual framework that provides an evidence-based foundation for pedagogical strategies and explains student learning success and failure. Self-regulated learning includes variables that influence learning, including self-efficacy, volition, and cognitive strategies (Panadero, 2017). Self-regulated learning has a broad theoretical scope connecting well-known contemporary researchers, including William James, Lev Vygotsky, and Jean Piaget, by creating a blend of three central constructs in self-regulated learning: metacognition, strategic action, and motivation (Fox & Riconscente, 2008). These constructs, separate from the

intellectual quotient, are internal mental processes that may separate successful learners from those who are not. Specific pedagogical strategies lend themselves to targeting self-regulated learning skills.

Self-regulated learning has been studied by various researchers and applied to numerous disciplines. The most prolific researcher associated with self-regulated learning is Barry Zimmerman. His cyclical phase model is the most cited model of self-regulated learning (Panadero, 2017). Zimmerman proposed that the cyclical phase model of self-regulated learning consists of three phases employed by successful learners (Nilson, 2013). The three phases of the self-regulated learning cyclical model include *forethought*, *performance*, and *self-reflection,* with each phase comprising several subprocesses (Zimmerman, 1998). External factors can influence a student's self-regulation level, including past experiences, models, social persuasion, psychological factors, and peer feedback. The supposition is that learners can be taught the processes in each phase and develop self-regulated learning skills beyond their innate abilities resulting in successful learning. As a well-studied theoretical framework, self-regulated learning was the foundation for this study.

Team-Based Learning

The challenge of teaching with increased class sizes and students' need to apply knowledge to real-world problems through critical thinking was the impetus in creating team-based learning. Team-based learning is a type of small group instruction originated by Larry Michaelsen in the late 1970s (Fink, 2004). Abandoning the traditional lecture-style class for a flipped classroom with small group learning resulted in increased student accountability for their learning and made possible the design and execution of

application exercises (Parmelee, 2008). Team-based learning also addresses the students' needs to become practitioners who fully understand their discipline's background and depth. Components inherent to team-based learning require learners to properly understand the material rather than rote memorization of a protocol allowing for critical thinking skills (Janssen, Skeen, Bell, & Bradshaw, 2008). Bridging the gap between knowledge and professional practice requires learners to develop the essential skill of critical thinking. Team-based learning is a pedagogical strategy that successfully addresses the need for practitioners to use the field tools and own a deeper understanding of the foundations of those tools.

Due to the rapid increase in technological innovations and new information discoveries, becoming a lifelong learner is necessary. With the ability to access information on the Internet, rote memorization of material and facts is no longer valued in the workplace (Nilson, 2013; Remedios, 2012; Succi & Canovi, 2020). Instead, soft skills such as communication, collaboration, critical thinking, problem-solving, creativity, and innovation are more valued (World Economic Forum Future of Education, 2020). These soft skills can be generalized from one employment setting to another. Pedagogical strategies such as team-based learning that promote active learning rather than passive, lecture-style teaching allow students the opportunity to practice these desirable soft skills. Through application exercises and feedback, team interactions and practice promote students to become lifelong learners.

Peer Evaluation and Feedback

Peer evaluation is a learning strategy researched and used for many years. Topping (2009) wrote, "Peer assessment is an arrangement for learners to consider and

specify the level, value, or quality of a product or performance of other equal-status learners" (p. 20). The concept of students providing feedback about fellow students' performance is characterized in the literature through various terms: peer assessment, peer feedback, peer evaluation, and peer grading. Peer assessment and feedback may be interpreted as semantically similar monikers; however, some differentiate the terms based on distinct roles. Falchikov and Goldfinch (2000) defined *peer feedback* as a dialogue between learners communicating detailed comments regarding performance measured against a set standard. In comparison, *peer assessment* denotes a grade with or without comments and refers to the actual content or information exchanged (Double, McGrane, & Hopfenbeck, 2019; Falchikov & Goldfinch, 2000). Peer feedback and peer assessment have been well-studied in various disciplines, ages, and types of learners. Peer assessment and peer feedback may be interpreted as separate constructs and differentiated by how the process is implemented. The term *peer evaluation* is consistently used in the context of team-based learning. The term encompasses the assessor's role, the student being assessed, and the exchanging of detailed comments concluding with a graded assignment. Fink (2004), in the context of team-based learning, explained peer evaluation as the practice of having students assess every member of their team on their contributions to the team. The terms peer evaluation, peer assessment, and peer feedback are at times synonymous; in team-based learning, peer evaluation is the preferred term. The learning strategy of peer evaluation is an inherent feature of team-based learning.

Self-Reflection

Self-reflection is a metacognitive skill used to analyze one's performance and determine the need for adjustments. The practice of self-reflection is associated with

lifelong learners. Silver (2013) reminded readers that the idea of metacognition, the process of thinking about one's thinking, has been cited in the works of notable researchers such as Vygotsky, James, and Piaget. Donald Schon introduced the idea of being a self-reflective practitioner, someone who uses self-reflection. He argued for self-reflection as a strategy to prepare students for post-graduation occupations. Schon (1983) explained self-reflection as a planned activity contributing to continuous learning. Boud (1995) argued that learners with the ability to successfully self-assess could identify their academic strengths and weaknesses, allowing them the opportunity to adjust their environment for optimal outcomes. Self-reflection, a metacognitive skill, can enable students to adjust their learning environment resulting in improved academic outcomes.

Hypotheses

The following hypotheses were created to research four factors contributing to understanding the effect guided self-reflection has on a student's valuation and confidence in peer assessment. In Hypotheses 1-4, the learner type was defined as high- and low-SRL.

1. No significant differences will exist by type of learner between those participating in and not participating in a guided self-reflection protocol on their valuation of peer femedback quality as an instructional method as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas.
2. No significant differences will exist by type of learner between students participating in and not participating in a guided self-reflection protocol on their confidence in their submitted peer feedback quality as measured by

the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas.

3. No significant differences will exist by type of learner between students participating in and not participating in a guided self-reflection protocol on their confidence in the quality of received peer feedback as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas.
4. No significant differences will exist by type of learner between students participating in and not participating in a guided self-reflection protocol on their valuation of peer feedback as an important skill as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas.

Description of Terms

Allied Health. As defined by the Association of Schools Advancing Health Professions (2020), allied health professions include an extensive group of health professionals distinct from medicine and nursing health professions. Allied health practitioners evaluate, treat, and prevent disease processes and provide administrative support in the healthcare field.

Collaborative Practice. Collaborative practice is defined as multiple healthcare professionals from diverse fields working together to provide comprehensive care to patients, their caregivers, and the community (World Health Organization, 2010).

Confidence in the Quality of Received Peer Feedback. Confidence in the quality of received peer feedback was defined as the degree to which students consider

their peers eligible and reliable assessors of their academic work or behaviors (Huisman, Saab, Driel, & Broek, 2019).

Confidence in Submitted Peer Feedback Quality. Confidence in submitted peer feedback quality was defined as the degree to which students consider themselves eligible assessors of their peers' academic work or behaviors (Huisman et al., 2019).

Feedback Valuation as an Important Skill. The extent to which a student regards the peer feedback process as an essential learning goal was used to define feedback valuation as an important skill (Huisman et al., 2019).

Kole's Peer Evaluation. Kole's Peer Evaluation is a prescribed peer evaluation method using formative written feedback and summative performance evaluations (Michaelsen, Bauman-Knight, & Fink, 2004).

Peer Assessment. Peer assessment was defined as a team-based learning practice that requires students to assess other members of their established team relating to their contributions to the team and is formative, providing information that should be used to improve student and team performance for future academic endeavors (Michaelsen et al., 2004).

Peer Evaluation. Peer evaluation provides summative or formative data to the instructor of a course and each team member's performance and is calculated into the course grade, ensuring fairness in grading group projects (Falchikov & Goldfinch, 2000).

Peer Feedback. Peer feedback was defined as the communication of information from one learner to another who is of similar status about a task or performance that can modify behavior or performance for future learning tasks. Peer feedback can include

scores and comments and comprises summative and formative feedback (Huisman et al., 2019).

Self-Regulated Learning. Self-regulated learning is a type of learning directed by metacognition. Self-regulated learning is "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features of the environment" (Pintrich, 2000, p. 453).

Self-Reflection. Self-reflection is a process in which individuals compare their performance and assess their product toward the standard or feedback provided (Schunk & Zimmerman, 1998).

Team-Based Learning. The Team-Based Learning Collaborative defined team-based learning as an evidence-based collaborative learning strategy designed around units. Each unit comprises a three-step process that includes preparation, in-class readiness assurance testing, and application-focused activities (Michaelsen et al., 2004).

Valuation of Peer Feedback as an Instructional Method. Peer feedback valuation as an instruction method is defined as the student's level of valuation of the peer feedback process within an educational context. Also, the valuation of peer feedback is measured by the level of belief that students should be involved in assessing their peers and the extent to which they believe the process contributes to their learning (Huisman et al., 2019).

Significance

Research Gaps

Substantial research exists on team-based learning, but very little of that research has focused on specific peer assessment protocols, an inherent team-based learning component. Lerchenfeldt, Mi, and Eng (2019) addressed team-based learning's general effectiveness; however, research of homogeneous groups is limited. Strijbos, Pat-El, and Narciss (2010) identified feedback perception as a neglected area of research. Research conducted on attitudes and beliefs regarding peer assessment has been measured with various instrumentation, resulting in a lack of comparability. An express need for consistent measurement to guide this self-regulated learning skill practice and execution exists (Zundert, Sluijsmans, & Merriënboer, 2010). Additionally, research on peer feedback's effectiveness for graduate students in speech-language pathology and physical therapy is seemingly absent. Despite the requirement of teaching and measuring soft skills in allied health professions such as speech-language pathology and physical therapy graduate programs, little research is available to direct best practice and protocol in teaching, measuring, and documenting these skills.

Potential Implications for Practice

A primary goal of health professions education is to create lifelong learners who exhibit critical thinking, emotional intelligence, and collaboration skills. The scope of practice for speech-language pathologists and physical therapists includes professional practice domains and various service delivery domains rooted in evidence-based decisions (American Speech-Language and Hearing Association, 2020; Commission on Accreditation in Physical Therapy Education, 2021). The American Speech-Language

and Hearing Association (2020) described this scope of practice as dynamic and ever-changing, thus requiring practitioners to engage in continuing education and collaboration. For clinicians to maintain their value in the profession, they must equip themselves with self-regulated learning skills; that is to say, they must take responsibility for their learning.

With allied health programs charged with producing lifelong learners who contribute meaningfully to their profession and collaborate well with diverse professionals, they must implement evidence-based pedagogical methods to address this charge. According to Zimmerman, Bonner, and Kovach (1996), few teachers use strategies to teach their students self-regulated learning (see also Zimmerman, 2002). The research conducted in this study provides instructors in the allied health fields with the knowledge to choose pedagogical methods and activities to create lifelong learners with adequate interpersonal skills and proficiency in keeping up with the growth of knowledge and skills inherent in the allied health professions.

Process to Accomplish

Design

A quantitative, quasi-experimental strategy was used in this study. For each hypothesis, a 2 x 2 factorial between-groups design was used. Each hypothesis has the same independent variables of peer feedback type (Kole's modified feedback protocol versus Kole's modified feedback protocol with a guided self-reflection component) and type of learner (high SRL versus low SRL). The dependent variable for Hypothesis 1 was the valuation of peer feedback quality as an instructional method. For Hypothesis 2, the dependent variable was confidence in submitted peer feedback quality. The dependent

variable for Hypothesis 3 was confidence in the quality of received peer feedback. For the fourth and final Hypothesis, the dependent variable was peer feedback valuation as an important skill. Each dependent variable was measured using the BPFQ.

Sample

This study's sample consisted of survey data gathered from first- and second-year graduate students pursuing degrees in physical therapy and speech-language pathology at a small private university in Central Arkansas. The average age of the students was 24, with 80% female and 20% male.

Instrumentation

The BPFQ was used to measure students' beliefs about peer feedback (Huisman et al., 2019). The questionnaire measures four different themes associated with beliefs about peer feedback. These constructs include valuation of peer feedback as an instructional method with four items ($\alpha = .81$), confidence in own peer feedback quality with two items ($\alpha = .82$), confidence in the quality of received peer feedback with two items ($\alpha = 75$), and valuation of peer feedback as an important skill with three items ($\alpha = 73$). The questionnaire comprises 11 items and is measured on a 5-point Likert scale from 1 (completely disagree) to 5 (completely agree) for the scales' valuation of peer feedback as an instructional method and valuation of peer feedback as an important skill. The labels range from 1 (completely not applicable to me) to 5 (completely applicable to me) for the scale's confidence in own peer feedback quality and confidence in the quality of received peer feedback. A completed exploratory and confirmatory study corroborated the four scales. The confirmatory factor analyses were conducted using the R package lavann v.0.5-23, and internal reliability was computed as Cronbach's alpha.

The Motivated Strategies for Learning Questionnaire (MSLQ) was used to identify students' learning type as either high SRL or low SRL. The MSLQ is a frequently used instrument to measure self-regulated learning and was designed to measure three self-regulated learning constructs as the foundation: motivation, metacognition, and behavior (Pintrich, Smith, Garcia, & McKeachie, 1991). The instrument comprises a motivation section and a learning strategies section offering 15 different scales that may be administered together or as stand-alone scales. For each scale, the students rate themselves on a 7-point Likert scale from 1 (not at all true of me) to 7 (very true of me). For each subscale, the Cronbach's alphas ranged from .52-.93, and confirmatory factor analyses indicated that the MSLQ has reasonable factor validity.

Data Analysis

A 2 x 2 factorial between-groups analysis of variance (ANOVA) was conducted to address each of the four hypotheses. Hypothesis 1 was analyzed using a 2 x 2 factorial between-groups ANOVA with the type of learner and protocol with a self-reflection component versus the protocol with no self-reflection component as the independent variables and valuation of peer feedback quality as an instructional method as measured by the BPFQ as the dependent variable. Hypothesis 2 was analyzed using a 2 x 2 factorial between-groups ANOVA with the type of learner and self-reflection versus no self-reflection as the independent variables and confidence in submitted peer feedback quality as measured by the BPFQ as the dependent variable. Hypothesis 3 was analyzed using a 2 x 2 factorial between-groups ANOVA with the type of learner and self-reflection versus no self-reflection as the independent variables and confidence in the quality of received peer feedback as measured by the BPFQ as the dependent variable. Hypothesis 4 was

analyzed using a 2 x 2 factorial between-groups ANOVA with the type of learner and self-reflection versus no self-reflection as the independent variables and valuation of peer feedback as an important skill as measured by the BPFQ as the dependent variable. A two-tailed test with a .05 level of significance was used to test the null hypotheses.

Summary

Allied health fields seek out clinical practitioners equipped with critical thinking skills, effective soft skills, and self-learning abilities. If professional programs aim to create such practitioners, then evidence-based pedagogical strategies need to be implemented that address these skills' development (de la Harpe & Radloff, 2000; Janssen et al., 2008; Panadero, Jonsson, & Strijbos, 2016). Specific pedagogical methods and procedures such as team-based learning use self-regulated learning constructs. These constructs include such practices as peer feedback facilitating the acquisition of critical thinking, soft skills, and self-learning. Infusing soft skills into the curriculum will better equip unseasoned practitioners and ensure their marketability in the workforce.

A review of the research on self-regulated learning, peer evaluation, and self-reflection provides strategies and practices that contribute to successful learning. Specific research in valuation and beliefs about peer assessment for allied health graduate students is lacking. Additional knowledge is essential to direct evidence-based instruction to understand peer evaluation and self-reflection practices better. Variables identified as significant predictors of students' valuation and beliefs about the process of peer assessment could be used to inform instructors on best practices of peer evaluation, thereby supporting self-regulated learning and increasing positive learning outcomes.

Chapter II investigated the related literature through the theoretical framework of self-regulated learning.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The sustainability and achievements of a society can be linked to a culture of lifelong learning. The characteristics that support lifelong learning parallel the elements associated with successful learners. These characteristics include self-knowledge, self-confidence, persistence, and an appreciation of learning (de la Harpe & Radloff, 2000). Despite the growing evidence that these characteristics are associated with successful learning and lifelong learning, teachers often choose not to include pedological strategies activities that contribute to their learners' development (Panadero et al., 2016). de la Harpe and Radloff (2000) described traditional teaching as focusing on the subject content rather than the learning process. Feedback is not provided to the student or teacher regarding the processes but rather the subject content. Society will benefit if more pedagogical practices emphasize the constructs contributing to successful learning and lifelong learning.

Knowing the value of lifelong learners, employers aggressively seek employees who exhibit efficient soft skills such as communication, collaboration, decision-making, and time management. In response to this market, educators have the task in higher education to equip graduates with the skills needed to meet these needs (Blumenstyk, 2015; Brown, Roediger, & McDaniel, 2014). In the area of allied health, practitioners who practice at the top of their license must continually acquire and synthesize the ever-

increasing information to provide evidence-based intervention within the context of collaborative practice (World Health Organization, 2010). Based on this evidence, Allied Health programs should provide an education that contributes toward lifelong learning skills and collaboration. An allied health professional who is an independent lifelong learner with adequate soft skills and effective interprofessional practice is highly valued.

Students who display high levels of self-regulation are associated with successful learning and interpersonal skills. Nilson (2013) described these students as intentional, independent, self-directed learners. These learners exhibited behavioral habits, values, and beliefs contributing to their success and possess self-efficacy, motivating them to meet the demands of educational endeavors and workplace responsibilities. Students who believe and value the practices associated with self-regulation are motivated to use those practices and reflect on outcomes to adjust as needed their learning strategies. While many traits associated with self-regulated learning are innate, most can be taught and developed (Kramarski, 2018). The knowledge that self-regulation skills are associated with successful learning is a reality that should be maximized in all education settings. Self-regulation practices are innate for some students but can also be learned; therefore, pedagogical practices should include self-regulated learning strategies and techniques.

Educators in professional programs desire pedagogical methods that contribute to highly skilled graduates prepared to enter a demanding workforce. Team-based learning is a pedagogical method that uses small group instruction, collaboration, and feedback to accomplish the goal of producing lifelong learners outfitted with professionalism and soft skills (Parmelee, 2008). The use of small group instruction such as team-based learning has become more common in allied health programs, and the use of peer assessment is

especially applicable to the allied health field due to the collaborative nature of both. Through peer interactions and practical application exercises, team-based learning targets collaboration, interpersonal interactions, and critical thinking, which healthcare industry stakeholders covet.

An inherent component of team-based learning is the peer-review process, where students are required to review and report on the performance of their peers. The ability to provide meaningful feedback and conversely receive feedback correlates to desirable real-world soft skills of communication, collaboration, and adaptability (Brooks & Ammons, 2003). In team-based learning, students can attain and practice this employability skill in a learning environment to later generalize to their workplace (Topping, 2017). Students who are proficient in peer feedback are often found to have high levels of self-regulation. With instruction and practice, students can become proficient in providing and receiving peer feedback, increasing their self-regulation abilities (Nilson, 2013). Whether students are naturally skilled in giving and receiving feedback or need to be instructed, this practice should be utilized in the education setting to equip students for the workforce. The team-based learning pedagogy offers an avenue for teaching employability skills.

This chapter will review relevant literature detailing team-based learning and the theoretical framework of self-regulated learning theory. A discussion of peer evaluation and application to team-based learning and self-regulated learning will also be presented. Additionally, a review of self-reflective practices is examined, along with how such practices may improve students' soft skills and learning.

Theoretical Framework: Self-Regulated Learning

Self-regulated learning is a comprehensive framework incorporating the constructs of cognition, metacognition, behavior, motivation, and affective aspects of learning, resulting in numerous self-regulated learning models from various theoretical perspectives (Panadero & Alonso-Tapia, 2014). The theory has roots in self-efficacy and social cognition theory and is associated with well-known psychological theories and researchers. A collaboration of research and interest in self-efficacy began between Barry Zimmerman and Dale Schunk, leading to Zimmerman's expansion of Albert Bandura's work in self-regulation and, consequently, his theory of self-regulated learning (Panadero, 2017). Evidence that self-regulated learning had depth and breadth in many constructs is well established. The application of self-regulated learning theory to numerous disciplines and a strong foundation in well-known theories and researchers give creditability to this theory.

The type of learning associated with self-regulated learning is not individualized, as the name might suggest. The process of self-regulated learning includes the learner's ability to integrate feedback from others (Zimmerman & Schunk, 2011). Learners with high self-regulated learning levels contribute their academic successes to the implementation of feedback and the resulting adjustment of their learning environments, resulting in achieving learning objectives. The self-regulated learning conceptual framework has provided a foundation for practical yet effective pedagogical methods and educational research. This framework is dependent on prescribed collaborative interactions and activities.

Over the last 3 decades, much has been written and researched on self-regulated learning. Self-regulated learning constructs became a focus in educational psychology in the 1980s, and since, a plethora of research and publications have emerged, resulting in the self-regulated learning framework becoming the predominant theory in educational psychology (Panadero et al., 2016). Numerous self-regulated learning models have been proposed providing a research framework in educational psychology (Boekaerts, 1991; Efklides, 2011; Fox & Riconscente, 2008; Järvelä, & Hadwin, 2013; Panadero, 2017; Pintrich, 2005; Winne & Hadwin, 1998; Zimmerman & Campillo, 2003). Self-regulated learning researchers span numerous academic areas, including music and sports, infusing self-regulated learning constructs such as metacognition, motivation, beliefs, and self-efficacy (Zimmerman & Schunk, 2011). The historical background and evolution of self-regulated learning are extensive. Research studies include application to various disciplines and ages of learners while drawing on many domains to explain how students become the expert in their learning processes. Self-regulated learning is a valid and well-researched theory providing a credible research framework for studying the constructs and processes associated with successful learners.

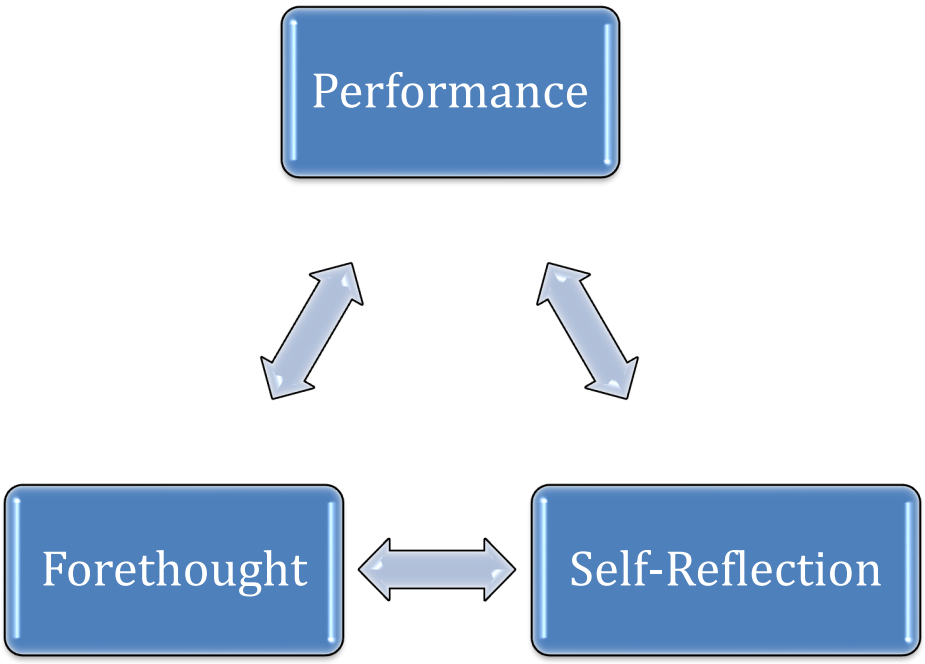
Zimmerman authored one of the first models of self-regulated learning. Since then, he has developed three self-regulated learning models: the triadic analysis of self-regulated learning, the cyclical phases of self-regulated learning (i.e., Zimmerman's model), and the multilevel model (Panadero, 2017). Panadero (2017) identified Zimmerman as the most prolific researcher in self-regulated learning, with numerous empirical research studies supporting his models Zimmerman's first model, the triadic analysis of self-regulated learning, is an extension and blend of collaborative research

with Bandura and Rosenthal in social cognitive learning (Zimmerman, 1989). Social learning theory purports that knowledge acquisition results from environmental influences and the observation of others originally suggested by behavioral theorists like B. F. Skinner. Bandura (1977)contributed an additional notion to the behaviorist theory, which suggested that cognitive processes occur in conjunction with environmental influences in the learner's response. Zimmerman (1989) created this first theoretical self-regulated learning model by building on social cognitive learning theory and behaviorism theories.

In this first self-regulated learning model, Zimmerman also illustrated the communal nature of a person, environment, behavior, and the influence of feedback on the learning process. This self-regulated learning model differentiates self-regulatory influences from extrinsic behavioral effects, links self-regulatory processes to social learning, and identifies the role of self-efficacy and strategy use (Zimmerman, 1989). For example, SRLs combine metacognitive and cognitive processes such as task-related strategies, goal-setting, planning, and verbal self-instruction to maximize learning. The blending of social learning theory and self-regulated learning is the basis for Zimmerman's first self-regulated learning model. Zimmerman's self-regulated learning models are based on valid theoretical foundations, and he is considered the most active researcher and publisher of self-regulated learning.

The cyclical phases model, Zimmerman's second model, incorporates the connection between metacognition and motivation in an open-ended process. Zimmerman later added subprocesses to each phase of the cyclical model known as Zimmerman's model (Zimmerman & Campillo, 2003). This comprehensive model is

cited more than any other self-regulated learning model. The update to the model in 2009 resulted in an additional subprocess in the performance phase (Panadero, 2017). Zimmerman's cyclical phases model brings together the constructs of metacognition and reflection while encompassing perspectives from several psychological theories addressing the cognitive, motivational, and strategic aspects of learning. Zimmerman (2000) explained that self-regulated learning consists of three phases or elements that contribute to students' present and future successes in learning. These phases include forethought, performance, and self-reflection (see Figure 1). Each of the three phases provides ample explanation and examples of self-regulatory strategies, all of which can be learned when incorporated into pedagogical practices. Nilson (2013) described Zimmerman's model as an automatic sequenced routine practiced by successful learners. The process's cyclical nature informs the learner of the changes and adaptations required to improve academic outcomes. Zimmerman's second self-regulated learning model incorporates metacognition and motivation in an open-ended process.



Forethought	Performance	Self-Reflection
Goal setting	Attention focusing	Self-evaluation
Strategic planning	Self-instruction/imagery	Attribution
Self-efficacy beliefs	Self-monitoring	Self-reactions
Goal orientation		Adaptivity
Intrinsic interest		

Figure 1. Cyclical phases model. Adapted from Zimmerman (1998).

In the first phase, *forethought*, students analyze a task, engage in strategic planning activities such as goal-setting and goal-orientation, and consider their interest in the task before execution. Zimmerman (1998) explained that the influence of self-efficacy directly affects motivation, without which a learner's self-regulatory skills are worthless. Nilson (2013) asserted that a learner uses this motivational component to determine the assignment's perceived value. Students who attribute value to completing a task are more motivated to engage and learn from the assigned task. In addition to the task's perceived value are the student's intrinsic beliefs regarding self-efficacy (Zimmerman, 2013). Bandura (1986) described *self-efficacy* as an individual's perception

regarding the ability to recognize and execute the appropriate strategies and actions needed to successfully perform a task and the confidence in managing the environment. This evidence suggests that intrinsic and extrinsic factors play a role in a student's decision to invest in a learning task. Students who believe they have the power to manipulate their learning environment to meet the demands set before them will demonstrate initiative to improve on a failed task.

Not all students utilize this first phase of Zimmerman's model. Students with low self-efficacy believe they do not have control over their learning outcomes and, as a result, become frustrated with the learning process and eventually concede all efforts (Bandura, 1997). Bandura (1997) also explains that although self-efficacy is an intrinsic quality, external factors can influence how much a student possesses these external factors include past experiences, models, social persuasion, psychological factors, and peer feedback. Another component of this first phase is goal orientation, where a student is focused on the acquisition of learning rather than grade ratings (Bandura, 1997). Students who are motivated and possess self-efficacy are more likely to invest time and effort in their learning resulting in more success. Goal orientation is another subprocess within forethought, described by Pintrich (2005) as a more general reason a learner does a task. This identified reason may determine how they measure their outcomes. If students are motivated by competition with peers, they will judge their peers' outcomes and strategize accordingly. Forethought, the first phase of Zimmerman's model, comprises strategic activities such as goal-setting and planning and personal beliefs, including self-efficacy and goal orientation.

In the second phase of the model, *performance*, the student participates in the learning task. Panadero (2017) characterized the performance phase as executing a task while simultaneously self-monitoring progress. Self-monitoring is a feedback loop propelling students to implement and adjust learning strategies to optimize their successes and engagement. Zimmerman and Schunk (2001) explained that students use social comparison, attributional feedback, and self-verbalization strategies in this phase. These strategies keep the student cognitively engaged and motivated during a task through the completion. Executing the assigned task while monitoring is the second phase of this cyclical model.

The last phase of Zimmerman's cyclical phase model is *self-reflection*. In this phase, the student engages in self-judgment and self-reaction (Nilson, 2013). The student can then note adjustments to improve performance for future tasks (Panadero, 2017). Boud (1995) asserted that self-assessment, which Zimmerman (1998) identified as a subprocess of self-reflection, allows learners to measure their learning through the feedback provided by others and themselves. Students may measure their performance against a standard set by others or by standards set for themselves. Zimmerman also explained that attributions are another subprocess contributing to self-reflection. Students with self-regulated learning abilities can understand the reasons for the success or lack of a task's success. The learner uses the information gained from attribution for another subprocess, adaptation. The purpose of adaptation is to correct and refine the learning process and affect the strategies implemented in forethought and performance. The last phase of Zimmerman's cyclical phase model of self-regulated learning is self-reflection.

Students' successful execution of these subprocesses (forethought, performance, and self-reflection) is instrumental in current and future learning. Self-regulated learning provides a framework for researchers to study the cognitive, motivational, and emotional aspects of learning (Zimmerman, 1998). Researchers associated with self-regulated learning have explored these phases in the context of academic learning to explain why some learners are more successful than other learners (Bandura, 1997; Lin, 2019; Nilson, 2013; Panadero, 2017; Pintrich, 2005; Winne & Hadwin, 1998; Zimmerman & Campillo, 2003.) The ability to identify variables associated with academic success can inform pedagogical practice. Understanding the self-regulated cyclical phase model provides a framework to research individual learning components and how best to exploit them for student success.

The self-regulated learning framework explains how learners approach their academic endeavors using a system encompassing metacognition, behavior strategies, and motivation paradigms. As noted previously, self-regulated learning materialized from and incorporated Bandura's social cognitive theory (Bandura, 1986). Social cognitive theory provided a footing for self-regulated learning concepts of metacognition, the ability to think about one's thinking processes, and motivation. Bandura (1997) discovered that children who exhibit self-efficacy, a belief regarding competence, also demonstrate self-regulated learning. Individuals with intact self-efficacy can control their thoughts, behaviors, and environment, resulting in more effective learning. Learners who believe they can manage and modify their learning environment through self-regulation processes of planning, goal setting, and self-assessment are more successful than learners who do not possess these processes. Understanding the self-regulated learning framework

in context with social cognitive theory enlightens educators to specific constructs that explain learners' successes or shortfalls.

The supposition is that self-regulated learners enter the academic environment with prerequisite skills that promote their academic endeavors. These individuals are described by Nilson (2013) as being independent, intentional, and self-directed. Students with high self-regulation levels are known to set goals, actively participate in class, be self-motivated, maintain focus, and conduct self-reflection. Also, Schunk and Zimmerman (1998) further explained that these students implement effective learning strategies and demonstrate an overall higher persistence level. Self-regulated learners can identify and discern successful study strategies from unsuccessful ones. These learners are active participants in the learning process, taking on their learning responsibilities and becoming lifelong learners. Students identified as high SRLs innately possess the features associated with successful learning.

Because the traits associated with high self-regulated learning seem to predict student success, one might reason teaching self-regulated learning abilities to students with low self-regulated learning traits can improve learning. Schunk and Ertmer (2000) iterated that any student capable of learning can learn self-regulatory skills. One such characteristic associated with learners of high self-regulated learning is their use and accuracy of self-reflection and self-assessment. Zimmerman (1998) described *self-reflection* as a process that occurs after learning and influences the learners' reaction to the experience. The high SRL then uses this influence to make needed adjustments to their learning process, increasing academic success. Although some students naturally identify and adjust components in their learning environments, others may need explicit

instruction and practice. Emke et al. (2015) found that students improved over time in their abilities to accurately self-assess and reflect on performance, thus giving credence to the idea that this particular self-regulated learning trait can be taught. Students can become active participants by learning how to learn, leading to independent lifelong learners. Because self-regulated learning traits can be taught, educators should consider infusing these traits into their current pedagogy.

Another process associated with self-regulated learning that can be taught and learned is peer evaluation. Much research has been published regarding the relationship between the practice of feedback and self-regulated learning, and the use of well-designed peer evaluation is assumed to increase the use of self-regulated learning (Butler & Winne, 1995; Nicol & Macfarlane, 2006; Panadero et al., 2016). Nicol and Macfarlane (2006) presented best practice principles of formative peer assessment and iterated formative peer assessment to develop self-regulated learning, resulting in lifelong learning practices. Further evidence supports acquiring self-regulated learning skills by implementing class activities such as peer assessment. Peer assessment has been linked with self-regulated learning skills, but more research is needed to determine its effect on the different components of the self-regulated learning processes.

Team-Based Learning

Creating effective lifelong learners is an overarching goal of higher education. Sibley and Parmelee (2008) noted that professional programs have evolved into competency-based instruction, emphasizing communication skills, teamwork, problem-solving, and active learning. Faculty are challenged to address and measure these competencies while managing an ever-increasing workload (Michaelsen, Davidson, &

Major, 2014). Healthcare and other professional programs emphasize acquiring new skills beyond formal education. Individuals are expected to solve complex problems in a collaborative environment while keeping up with the enormous amount of new information. As a result, higher education faculty are searching for efficient solutions to prepare their students for the demands of future employers. Many programs have implemented small group teaching to meet these challenges. Small group teaching includes various methods, including seminars, tutorials, workshops, and problem-based learning (Exely & Dennick, 2004). Another instructional strategy used to overcome instructional challenges is the flipped classroom. One such pedagogy incorporating small group learning and a flipped classroom is team-based learning. A desirable outcome for any institution of higher education is to cultivate lifelong learners.

As a teaching strategy, team-based learning is based on two broad factors: group cohesiveness and student accountability. Michaelsen et al. (2004) outlined the importance of group cohesiveness in team-based learning. Group cohesiveness produces a self-managed team able to apply newly acquired knowledge to authentic problems, generalizable to future work settings. Michaelsen et al. (2014) described the other team-based learning factor as a shift from teacher-delivered information to the student being accountable for the information used in group activities, promoting analysis, synthesis, and application. In this teaching style, the student spends time outside of class, interacting with the assigned material, including readings, video lectures, quizzes, or other resources. In class, application of the newly acquired knowledge is targeted through activities such as case studies, discussions, analysis, and evaluation resulting in the student's proficiency in the course content, development of the ability to think and problem solve, preparation

to be a lifelong learner, and development of interpersonal skills. Periodically peer evaluation is infused with these two main factors. The purpose of peer evaluation is to provide feedback that allows the student to adjust and improve performance on the team. The proper use of summative and formative peer evaluation increases student confidence, self-efficacy, and knowledge (Cestone, Levine, & Lane, 2008; de la Harpe & Radloff, 2000). Team-based learning provides a way for teachers to meet higher education's challenging requirements with two foundational factors.

The benefits associated with team-based learning implementation are considerable. Overall, team-based learning has been identified as an effective pedagogy (Cestone et al., 2008; Epstein, 2016; Haidet, Kubitz, & McCormack, 2014; Moore, Prewitt, Carpenter-McCullough, & Whitworth, 2020; Sibley & Parmelee, 2008; Zulkifli, Othman, Rahman, Rahim, & Abdullah, 2019). The effective use of the team-based learning strategy is associated with improved learning, increased satisfaction, enriched communication, and collaboration skill, and developed self-efficacy. In studies of medical students who completed a course using team-based learning protocol, students were highly satisfied with the construct and agreed that team-based learning enhanced their learning, communication skills, and self-confidence (Chhabra et al., 2017; Zulkifli et al., 2019). Peters et al. (2020) discovered that with team-based learning implementation, attendance improved, overall grades rose, and achievement measures increased compared to the non-team-based learning group. Students in a team-based learning course can improve on a category of skills that reach beyond the level of just knowledge. In conjunction with soft skills development, a greater appreciation of the learning process gives team-based learning pedagogy credibility.

The protocol and use of team-based learning are not without challenges and criticism. Students may resist this type of pedagogy if they have not experienced the team-based learning method (Whitley et al., 2015). Students who rely on and prefer a lecture-based, passive format may resent relying on themselves and their peers for learning. These students might perceive instructors as not fulfilling their roles (Moore et al., 2020; Sibbald, John-Baptiste, & Speechley, 2019). Another challenge to address is the formation of a functional learning group and the dynamics of the group. The implementation of team-based learning requires time in training, education, and setup. Any challenges with team-based learning can be alleviated through proper implementation and training.

Peer Assessment

The nature of peer assessment is multifaceted. Peer assessment can be conducted in various methods and can be successfully used in any discipline at any level (Double et al., 2019; Falchikov & Goldfinch, 2000). Due to the vast typology of peer assessment, conclusions regarding efficacy can be difficult. Topping (2009) identified a variety of protocols. Peer assessments have been used in numerous curriculum types and subject areas to assess a variety of students' academic competencies in formative and summative formats, including tests, writing samples, presentations, group work, and skilled professional behaviors. Historically, peer assessment has been used as a stand-alone assessment or combined with instructor assessment that may or may not affect course grades. Double et al. (2019) iterated the idiosyncratic nature of peer assessment and listed the following common types and features: grades, peer dialogs, written assessment, online, anonymous, qualitative, quantitative, and frequency. Topping (2009) described similar peer assessment variations and explained the variations in participant

arrangement and differences in the directional assignment, either one way or reciprocal. Instructors who wish to use peer assessment as a teaching strategy must choose from many methods. Peer assessment can be implemented in numerous ways and customized to meet the unique needs of a course.

Peer evaluation is an essential component of team-based learning or any collaborative group work and, if implemented correctly, may lead to increased accountability for the team. A common complaint of students and instructors regarding team-based learning or other group work is free riders, wherein particular members of the team fail to contribute equally to the team's efforts resulting in resentment of team members (Fink, 2004; Hannay, 2014; Jamalludim, Razman, & Niza, 2016; Pelley & McMahon, 2008). Herried (2004) contended that peer feedback ensures contribution accountability, helps students become more effective team members, and decreases free riders' effects. The nature of group work can result in undifferentiated group grades, in which low-performing members of the group receive the same grade as those who contributed more. Fink (2004) asserted that peer assessment differentiates between team contributions because the team members, not the instructor, have better insight into each team member's quality and quantitative contributions. In team-based learning, the team completes a task and receives a grade. At the end of the semester, the team completes the peer assessment protocol to assess members' contributions against an established standard. This assessment is then calculated into the student's overall grade, creating grade differentiation on group work. When implemented, peer assessment alleviates concerns of team accountability and undifferentiated group grading.

Peer assessment is not without criticism and contradiction, specifically regarding students' ability to measure peer work and collaborative skills. Kennedy (2005) analyzed peer assessment scores to determine the validity of students' feedback and their attitudes toward peer assessment. Kennedy discovered considerable discrepancies in the validity and reliability of student assessments with minimal differential allocation of grades. Additional evidence from the study indicated adverse stresses amongst team members. The author revealed that time was not allocated to instruct the subjects in assessment procedures, limiting the study (Hannay, 2014; Panadero et al., 2016). Students' assessment of peers may not be reliable or valid and may impose stress without proper training. Appropriate training and implementation of peer feedback are essential for effective outcomes.

Some variables can lead to improved peer-instructor variability. Students should judge the overall quality of a product rather than individual dimensions. A single peer assessment is better than multiple peer ratings (Falchikov & Goldfinch 2000; Li et al., 2016). Students' familiarity with the grading criteria will also improve validity. While Falchikov and Goldfinch (2000) found little evidence to support an association of increased validity with upper-level courses, Li et al. (2016) reported that higher validity was associated with the course level. Graduate-level courses reported the highest validity, then undergraduate courses and last high school courses. Öncü and Sengel (2011) found a moderate correlation between peer evaluation scores and final course grades in the context of team projects. Lerchenfeldt et al. (2019) discovered that peer feedback in a collaborative learning environment is a reliable assessment of professionalism. In a review of 43 studies, Topping (2017) reported peer assessment to be a more reliable and valid measure of student performance for various measured tasks than instructor assessment. However, seven studies revealed low reliability and validity for assigned

academic projects. Peer and instructor scores range from moderate to highly correlated in several academic areas for various educational products (Falchikov & Goldfinch, 2000; Li et al., 2016; Sanchez, Atkinson, Koenka, Moshontz, & Cooper, 2017; Stefani, 1994). Despite the heterogeneous nature of research on the validity and reliability of peer assessment, overall, researchers have unveiled the ability of peers to assess each other. Those who cast doubt on the use of peer assessment questioning its validity are without much evidence.

Peer assessment's validity and reliability indicated an overall view that peer assessment can be reliable and valid in measuring student work and professionalism. The reliability of peer assessment is most accurate when bolstered by training (Li et al., 2016). Topping (2009) concluded that meaningful feedback from multiple sources—peers and instructors—versus instructors alone, was more accurate and valuable in improving student outcomes. Students are in a more unique yet optimal position than their instructor to provide feedback to their peers in a group setting. Peer assessment can be a valid and reliable measure of students' academic products.

The expectation is that peer assessment will increase learning and quality of work. Double et al. (2019) discovered significant support for the use of peer assessment in improving academic learning, explicitly noting that peer assessment is more effective than no assessment and instructor assessment. Peer assessment enhances student learning and allows students to interact with discipline-specific knowledge and associated standards (Liu & Carless, 2006). An increase in the number of experimental research studies related to peer assessment, specifically regarding academic outcomes, has emerged in the literature. Within the self-regulated learning framework, formative peer assessment provides information to the student and the instructor, which improves later

educational outcomes. Increased learning and quality of work are outcomes of using peer assessment.

Further investigation of the literature revealed that peer assessment was ineffective in all domains. Crowe, Silva, and Ceresola (2015) found that peer assessment, generally associated with a product used to evaluate a technical skill such as writing assignments, did not improve final grades or positively affect writing performance compared to the group receiving instructor feedback. The authors contended that benefits such as engagement, interpersonal skills, and improved learning experiences were not measured and could conclude that peer review may not be warranted for technical skills. The methodology did not mention if the subjects were instructed to administer feedback in this context. Falchikov and Goldfinch (2000) discovered that peer assessment of professional skills is not as valid as peer assessment of academic products due to students' better familiarity with academic products than professional practices. Students could benefit in several ways from participating in peer assessment, including increased learning and quality of work. However, peer feedback alone is insufficient when teaching self-regulated learning skills to assess a technical skill.

Learning is most effective, and attrition is lowest when students are motivated and active in their learning. Peer assessment can motivate students to become active learners (Mentzer, Laux, Zissimopoulos, & Richards, 2016; Topping, 2017). Students are forced to understand the subject being assessed better when involved in peer assessment. Searby and Ewers (1997) distinguished performance and assessment as the need to own a more cognizant understanding of the assessment process than what is needed for performance. The ability to perform a skill is different from the ability to assess that skill. By equipping

themselves to evaluate skill sets, students will better understand the learning objectives. Simply, peer evaluation is a type of pedagogy.

For students to benefit from peer evaluation, the implementation and follow-up must follow best practice protocol. Without proper instruction and implementation, peer evaluation is ineffective and detrimental to students because resulting in negative experiences (Cestone et al., 2008; Gaynor, 2020; Hannay, 2014; Nicol & Macfarlane, 2006; Sprague, Wilson, & McKenzie, 2019; Sridharan & Boud, 2019). As peer evaluation is not intuitive, instruction and practice should be provided. Peer evaluation is like any other learned skill in that frequent practice in a low-stakes scenario ensures accuracy and confidence (Levine, 2008; Smith, Cooper, & Lancaster 2002). In addition to learning the fundamentals of peer evaluation, time should be invested teaching the relevance of peer evaluation (Nicol & Macfarlane, 2006; Pelley & McMahon, 2008). The importance of increased transparency in the assessment process has been investigated, discovering increased student confidence when students were involved in creating the assessment criteria (Smith et al., 2002). Training on administering peer evaluation increased students' motivation and acceptance of the process. The use of peer evaluation may invite criticism and doubt if not correctly implemented. Correct application of peer evaluation can be challenging and should follow evidence-based practice with knowledge of advantages and disadvantages discovered by experimenting with various methods.

Various methods of peer evaluation are described in the literature. Cestone et al. (2008) stated no one best protocol for implementing peer assessment. Levine (2008) stated that whatever type of peer evaluation is used, the protocol should promote an accurate reflection of the work, affect the course grade, and be set up in a way to accommodate the size of the learning

group. Hannay (2014) added the need for equity which increases student valuation and belief in the process. These guidances for the best practices give credence to the peer evaluation by affecting the course grade, resulting in increased accountability and assurance that group work is taken seriously. Some sources stressed the importance of anonymity, resulting in better grade differentiation and decreased fear of social repercussions in a group work setting (Levine, 2008; Sprague et al., 2019). However, Li et al. (2016) discovered that peer evaluation increased validity. Team-based learning practitioners argued that identifying an evaluator allows for constructive dialogue and the practice of interpersonal skills (Cestone et al., 2008). Levine (2008) stressed the importance of creating and maintaining a culture of professionalism in which individuals are expected to give and receive feedback regularly, alleviating fears of the process. Accuracy of the assessment by the peer provides beneficial feedback leading to increased learning and a better product. Benefits are great when equipped with proper instruction in a professional environment where the feedback is valued. Following evidence-based best practices in the implementation of peer evaluation is essential to reap the process's benefits.

Although peer evaluation can encompass summative assessment, most benefits result from formative-type assessment. Peer feedback should be formative, taking place during learning, so that students can make necessary adjustments in their performance (Topping, 2009). Mentzer et al. (2016) discovered that formative peer feedback resulted in higher course grades, increased feelings of competence, and student retention compared to summative peer assessment only. Peer evaluation can be completed in various formats. Evidence suggests that formative assessment is superior to summative. When considering peer evaluation as part of pedagogical practice, evidence-based implementation is necessary for the best outcomes.

Higher education is faced with several challenges, including declining enrollment and decreased funding; thus, instructors are asked to take on additional roles and responsibilities while class sizes increase. The long-term use of quality peer evaluation may assist with these challenges (Topping, 2009). Peer evaluation is practical for large class sizes (Korucu & Kartal, 2019; Remedios, 2012). As higher education instructors are looking for ways to teach larger class sizes effectively and efficiently, peer evaluation may help decrease the instructor's workload as peers can provide valuable feedback in the instructor's place. Pedagogical strategies, such as peer evaluation that result in reduced workloads and improved long-term outcomes, are a valuable resource with current challenges in higher education.

Peer feedback is not a homogenous procedure that is easily implemented. Despite the problems associated with peer feedback (bias, varying abilities, friendship marking, collusive marking, and grade reliability), Sibbald et al. (2019) concluded that benefits outweigh any problems. However, consideration should be given to the heterogeneous nature and the different methodologies employed. The decision to use peer assessment should be investigated carefully, weighing costs and benefits to students and instructors alike.

Self-Reflection

Reflection is part of Zimmerman's self-regulated learning cyclical phase model and requires students to compare their performance and assess their product toward the standard or feedback provided self-reflection is an essential component of meaningful self-assessment (Boud, 1995) and is crucial for developing lifelong learners (Schunk & Zimmerman, 1998). Panadero, Jonsson, and Strijbos (2017) explained the relationship between self-regulated learning and self-assessment as interdependent since both require learners to assess their performance. Self-reflection may be a tool to prepare students to develop into self-learners with

desirable employability skills post-graduation. Theoretical support exists for explaining the link between positive academic outcomes and self-reflection.

The definition of self-reflection includes different classifications and constructs. Zimmerman and Campillo (2003) explained self-reflection as having two distinct classifications: self-judgments and self-reactions. Students evaluate their problem-solving performance and attribute success or lack of success to a cause in the first category. A highly self-regulated learner with the characteristic of self-efficacy will use the information gained from self-judgment to make corrections in future endeavors. The latter category, self-reactions, is associated with learners' satisfaction with their performance. Learners who are dissatisfied with their performances may disengage with the learning to avoid dissatisfaction. Learners with a high self-regulated learning level will alter their approaches to improve self-satisfaction and continue learning. Self-reflection is a metacognitive skill used to alter learning outcomes. The supposition is that instructors can infuse this practice into their pedagogy to increase student motivation and academic outcomes.

The ability to reflect on one's performance is a skill, like other self-regulated learning skills, and can be learned and improved beyond one's inherent ability. Components of self-regulated learning, such as self-reflection and self-assessment, can be infused into the curriculum or taught as a separate course (Hofer, Yu, & Pintrich, 1998). Teaching students to become self-regulated learners is possible with intentional instructional application. Developing skills that result in improved learning can be part of an instructor's goal. Students can learn these skills if taught and used despite their innate abilities or inabilities to self-regulate their learning.

Reflective practice is recognized as an essential skill associated with self-learning. Schon (1983) argued that experience alone did not result in learning; instead, reflection needed to be

part of the learning process. He maintained that the act of effective self-reflection allows a learner to ponder on outcomes, emotions, and responses to achieve a higher understanding of the stated learning goal and, if necessary, create an improvement plan. Effective self-learning, essential for continued professional growth, is made possible through the practice of self-reflection.

The practice of self-reflection manifests in different forms. Schon (1983) brought to attention three different methods: reflection-in-action, reflection-on-action, and reflection-for-action. Reflection-in-action occurs during an event requiring the learner to be decisive at the moment regarding the task at hand. Reflection-on-action refers to how an individual reflects on an event that has already occurred to attain information for future endeavors. The last manifestation of self-reflection, described by Schon, reflection-for-action, is proactive in that learners reflect on possible scenarios and how they will respond in such a way to achieve success. The practice of self-reflection can be conducted in various forms. Despite the different forms of self-reflection that can be used, each requires critical thinking on the part of students.

Self-reflection is measured through various criteria. Zimmerman (2000) identified four benchmarks used by people to evaluate themselves. The first benchmark is termed *mastery*. Mastery refers to a set hierarchical standard to measure one's skills. A hierarchical standard allows individuals to measure their progress and attain goals. Zimmerman explained that the second benchmark is *previous performance* when comparing current behavior to a previously measured baseline. Conversely, with *normative criteria,* people compare themselves to others. For example, comparing one's grade on an academic task to a peer's grade on the same task is a normative criterion. This type of comparison is used in sports and employment settings and can be competitive and unambiguous. The last benchmark in which individuals compare themselves

is *collective criterion,* typically used in teams. The comparison is intrapersonal, but the performance is based on the contribution made to the team. For example, the president's success on a board of directors is measured based on that office's role and the board's overall success. Self-reflection can be conducted within the framework of diverse standards.

The skills and outcomes associated with self-reflection are beneficial in academic and work environments. Self-reflection for improved performance and the development of reflective practitioners has become standard practice in healthcare (Bindels, Verberg, Scherpbier, Heeneman, & Lombarts, 2018; Boud, 1995; Georgia, Aamli-Gaagnat, Saad, Rousal, & Sreter, 2017; Koshy, Limb, Gundogan, Whitehurst, & Jafree, 2017; Robert, Piemonte, & Truten, 2018). The use of self-reflection improves individual performance as well as team performance. These benefits have been acknowledged and are now encouraged in healthcare.

The processes involved in self-reflection are appropriate for a broad range of performance outcomes in academia and beyond. Silver (2013) suggested that the purposes and protocol of self-reflection can positively affect any discipline. These authors suggested evidence-based strategies to benefit from self-reflective activities, regardless of discipline. Training in and practice of processes of self-reflection are imperative (Stupans, March, & Owen, 2013). Also, students must possess acceptance in the practice of self-reflection and should be able to discern when self-reflection is necessitated. Nilson (2013) explained that instructors could use meta-assignments to give students insight into their thinking and reflect on things they might not have otherwise. These assignments can result in higher grades, add value to education, and allow students to appreciate the assigned task better. Also, they increase their self-regulating skills and their abilities to learn how to learn. Self-reflective practices can be implemented in

various ways with prescribed components. Many disciplines can use self-reflective practices in and out of academia.

Self-reflection plays an essential role in developing professional skills, academic outcomes, leadership development, and self-efficacy. Masoud (2020) discovered that using electronic portfolios, a form of self-reflection, with student teachers increased self-reflective practices, which positively affected their self-efficacy and confidence. Korucu and Kartal (2019) reported that student teachers who participated in self-reflective practice conveyed increased content knowledge and critical thinking but found the process time-consuming and repetitive. While enrolled in a dental practicum course, participants of a standardized self-reflection protocol reported improved clinical skills, corroborated by instructor grades. Of the participants, 18% reported not accepting the process, especially for unsuccessful tasks, as they did not wish to reflect on poor experiences (Anbarasi, Vijayaraghavan, Latha, Kandaswamy, & Kannan, 2019). Mori, Batty, and Brooks (2008) reasoned clinical practicum as an ideal setting for learning self-reflection. They discovered that using an electronic format for self-reflection during a physical therapy clinical practicum experience resulted in positive clinical practice effects. Robert et al. (2018) used reflective practice with medical students to increase empathy and decrease the didactic curriculum and clinical practicum gap. The practice of self-reflection contributes to the development of lifelong learners. Professional skill development involves more than didactic learning, grading, and endorsement. The formation of critical thinking and problem-solving skills is related to learned self-assessment and reflection practices.

The use of self-reflective practices aids individuals beyond formal educational settings into employment and professional settings. Gregory and Burbage (2017) found that self-reflection and collaboration skills generalized from an education setting to a practicum setting. The bridge from didactic learning to clinical practice for healthcare professions occurs in a clinical practicum. Stupans et al. (2013) discovered that using a scaffolded self-reflective protocol during a clinical practicum experience resulted in high-quality self-reflection believed to aid in ongoing professional development. Individuals who are learning how to use self-reflection benefit more in other areas besides academics. Success in employment and professional settings can be attributed to self-reflect and amend behaviors resulting in desired outcomes.

The effects of self-reflection on self-regulated learning are challenging to measure due to the multifarious nature of the execution of self-reflection and the various self-regulatory constructs. Self-reflections' positive effects on self-regulated learning are questionable (Brown & Harris, 2014). Panadero et al. (2017) discovered in their meta-analysis that most studies highlighted the benefits of a scaffolded self-reflection protocol on self-regulated skills. However, the effect sizes were varied based on the component of self-regulation that was measured. Nicol and Macfarlane (2006) included self-reflection as one of the seven principles associated with increased self-regulatory skills. Without a standard self-reflection protocol to measure the effect, results will vary. Despite the challenges in measuring the effect of self-reflection on self-regulation, researchers agree that a positive effect exists.

Summary

Developing lifelong learners combined with proficient soft skills is the objective of higher education programs. In allied health, practitioners are expected to work in an interdisciplinary healthcare environment with such soft skills as communication, collaboration, teamwork, and reflection (Commission on Accreditation in Physical Therapy Education, 2021; Council on Academic Accreditation in Audiology and Speech-Language Pathology, 2020). With such skills, a college graduate can keep up with the demands of ever-increasing knowledge and, if needed, retool into a new career field. As a result, allied health programs' instructors and program directors seek pedagogical strategies and evidence-based practices to teach, measure, and document these competencies.

Professional programs are charged with creating self-learners who can problem solve and collaborate. Instruction in professional programs has evolved from traditional lecture styles to engaging practices such as flipped classrooms, collaborative learning, problem-based learning, small group instruction, and team-based learning (Parmelee, 2008). In this literature review, team-based learning was a useful pedagogical strategy for achieving positive outcomes related to hard and soft skills in allied health education. Team-based learning's pedagogical approach will provide the context through which this research explores the value self-reflection adds to peer feedback inherent in the team-based learning philosophy.

When implemented appropriately, peer evaluation provides an avenue for students to acquire competencies in giving and receiving constructive feedback. Peer feedback adds accountability to the team and in general, peer evaluation helps students learn and teach each other while practicing and developing critical thinking skills (Ching-Wen, Pearman, & Farha, 2010; Topping, 2017). Peer assessment is useful in various contexts, ages, and abilities

(Michaelsen, Davidson, & Major, 2014). Reliability and validity are commensurate with instructor assessment (Topping, 2009). Peer evaluation is a valuable construct that allows learners to learn and practice soft skills such as communication, teamwork, adaptability, and problem-solving.

Self-reflection is a metacognitive skill used to analyze one's performance and the need for adjustments. The practice of self-reflection contributes to self-learning, which is associated with becoming a lifelong learner (Nilson, 2013). Also, self-reflection prepares students for post-graduation occupations (Schon, 1983). Self-reflection has become standard practice in healthcare, resulting in improved individual and team performance. Reflection is part of Zimmerman's self-regulated learning cyclical phase model requiring students to compare their performance and assess their product toward the standard or feedback provided (Schunk & Zimmerman, 1998; Zimmerman & Moylan, 2009). Reflection is an essential component of meaningful self-assessment (Boud, 1995). Self-reflection can be manifested and implemented across ages and disciplines. The practice of self-reflection can contribute to students' preparation for employability and the ability to self-learn beyond formal education.

This chapter's literature review provided a theoretical framework, self-regulated learning, used in this study. This chapter also presented a review of an efficacious instructional strategy, team-based learning, and how this strategy can positively affect the development of soft skills due to the inherent practice of peer assessment and collaboration. Additional review of self-regulated learning, specifically the subprocess of self-reflection, found this metacognitive process associated with the development of self-learning and interpersonal skills fitting into the framework of self-regulation. Most research regarding peer evaluation effectiveness or self-reflection is qualitative and does not provide sufficient data to guide the practice and execution

of these self-regulated learning skills. Despite the requirement of teaching and measuring soft skills in allied health professions such as speech-language pathology and physical therapy graduate programs, little research is available to direct best practices and protocols to teach, measure, and document these skills. To this end, the focus of this research was to examine variables that may affect the formation of best practices in the teaching and implementation of peer assessment and self-reflection and its effect on different levels of self-regulation in students. Chapter III includes the research design, sample, instrumentation, data collection procedures, analytical methods, and limitations.

CHAPTER III

METHODOLOGY

Higher education instructors seek an effective pedagogy targeting employability skills such as collaboration, communication, and lifelong learning. The literature review indicated that self-regulation skills are associated with successful learners and the acquisition of soft skills that employers covet. In addition, the literature indicated multiple benefits of pedagogical practices such as team-based learning and the inherent component of peer feedback. The literature review also revealed that any educational endeavor is affected by students' perceived value and motivation to engage in said endeavor. Experimental studies directing best practice protocols for peer feedback and the role of self-reflection on valuation and motivation are lacking.

The purpose of this chapter is to introduce the research methodology for this quantitative study regarding graduate students in the allied health field and their measured valuation of peer feedback, confidence in the quality of their submitted and received peer feedback, and whether peer feedback is an important skill. Each participant evaluated these constructs, and comparisons were made between those who did not complete a self-reflection protocol with Kole's modified peer feedback. These constructs were further analyzed by the learner type, those identified as high SRLs compared to those identified as low SRLs. This approach allowed for a deeper understanding of what may constitute an ideal peer review process within the context of the team-based learning

pedagogy and provided information regarding how the type of learner may influence the perceived value and motivation of a peer-review process. The research design, participant sample, instrumentation, data collection procedures, and analytical methods are discussed.

Research Design

The purpose of this study was to evaluate four factors that may contribute to understanding the effect that guided self-reflection has on a student's valuation and confidence in peer assessment, an inherent component of team-based learning and contributor to soft skill development. The four factors include valuation of peer feedback quality as an instructional method, confidence in submitted peer feedback quality, confidence in the quality of received peer feedback, and valuation of peer feedback as an essential skill. Each factor was further compared by type of learner, high SRL versus low SRL. These factors were assessed using a quantitative, quasi-experimental design. Orlikoff, Schiavetti, and Metz (2015) explained that quantitative research studies result from an observation that can be measured to report results in numerical values. As outlined in Christensen and Johnson (2016), quantitative research is a way to seek confirmation of a theory or hypothesis with empirical data. Because this study aimed to determine the validity of an intervention through the lens of an established theoretical framework, a quantitative approach with an experimental design was executed. The experimental design allowed the researcher to determine a cause-and-effect relationship by manipulating variables.

A 2 x 2 factorial between-groups design was used to address each of the four hypotheses in testing differences between several means in more than two groups and

more than two conditions (Orlikoff et al., 2015). All the hypotheses used the learner type and whether participants used a protocol with a self-reflection component as the independent variables. The dependent variables for the four hypotheses were the valuation of peer feedback quality as an instructional method, confidence in submitted peer feedback quality, confidence in the quality of received peer feedback, and the valuation of peer feedback as an important skill. The BPFQ measured the dependent variables.

Sample

The sample for the study was first and second-year graduate students from three cohorts of a physical therapy graduate program and three cohorts of a speech-language pathology graduate program, both from the same private university in Central Arkansas. The two graduate programs included courses taught in the team-based learning format for over 5 years. Each participant was enrolled in at least one course delivered in a team-based learning format which included peer feedback. To provide standardization, and as suggested by previous research (Cestone et al., 2008; Gaynor, 2020; Hannay, 2014; Nicol & Macfarlane, 2006; Pelley & McMahon, 2008), participants completed training, created and taught by the researcher, on giving and receiving effective peer feedback. The training was presented in an asynchronous video format through the course learning management system, Canvas. The training content was modeled after the published work of Michaelsen and Schultheiss (1989). Data were collected over 2 semesters: Spring 2021 and Fall 2021. In the spring of 2021, first-year physical therapy graduate students enrolled in a neuroscience course, and second-year students enrolled in the adult neurogenics course, representing two separate doctorates of physical therapy cohorts.

Also, in Spring 2021, graduate, master's level, speech-language pathology students enrolled in clinical issues in the late adolescents to early adult population course, representing one master of speech-language pathology cohort. In the fall of 2021, first-year physical therapy graduate students enrolled in gross anatomy, representing one cohort. Two cohorts of graduate speech-language pathology students in this same semester were included. First-year speech-language pathology students enrolled in neurology, and second-year students enrolled in adult neurogenics. To attain results representing the population studied, students in each program were allowed to participate voluntarily in the study. Each student choosing to participate signed a consent form (Appendix A). Only data from students who completed the research process were included for analysis (n = 111). Students not fully completing the research protocol or dropping the courses before the end of the semester were excluded from the study.

Instrumentation

The participants in this study were administered two instruments. The first, MSLQ, was administered by paper to all participants to identify students' learning type as either high or low SRL (Appendix B). Responses and data were kept confidential and entered into an Excel document for scoring and organization. Data were coded through the use of a randomly assigned participant number. The MSLQ is a frequently used instrument to measure self-regulated learning and was designed to quantify three self-regulated learning constructs: motivation, metacognition, and behavior (Pintrich et al., 1991). The instrument includes a motivation section and a learning strategies section offering 15 different scales that may be administered together or as stand-alone scales. For each scale, the students rate themselves on a 7-point Likert scale from 1 (not at all

true of me) to 7 (very true of me). For each subscale, the Cronbach's alphas ranged from .52-.93, and confirmatory factor analyses indicated that the MSLQ has reasonable factor validity. The median score from the MSLQ was calculated to identify the type of learner for this research study. Participants were identified as high SRLs if their total score was above the median, and low SRLs were identified as those that scored below the median.

The BPFQ was used to measure students' beliefs about peer feedback (Huisman et al., 2019) and was administered in paper form following the completion of the semester (Appendix C). Responses and data were coded and kept confidential when entered into an Excel document for scoring and organization. The questionnaire measures four different themes associated with beliefs about peer feedback. These constructs include valuation of peer feedback as an instructional method with four items ($\alpha = .81$), confidence in own peer feedback quality with two items ($\alpha = .82$), confidence in the quality of received peer feedback with two items ($\alpha = 75$), and valuation of peer feedback as an important skill with three items ($\alpha = 73$). The questionnaire comprises 11 items and is measured on a 5-point Likert scale from 1 (completely disagree) to 5 (completely agree) for the scale's valuation of peer feedback as an instructional method and valuation of peer feedback as an important skill. The labels ranged from 1 (completely not applicable to me) to 5 (completely applicable to me) for the scale's confidence in feedback and confidence in the quality of received feedback. A completed exploratory and confirmatory study corroborated the four scales. The confirmatory factor analyses were conducted using the R package lavann v.0.5-23, and internal reliability was computed as Cronbach's alpha. Results from this instrument were used to measure the four dependent variables.

Data Collection Procedures

Before collecting data, an application was submitted and approved by the Institutional Review Board. The research was conducted in an educational setting involving typical pedagogical practices that posed no risk to the participants. Data were collected anonymously. Participants voluntarily participated in the research and were permitted to drop out of the study at any time. Participants were randomly assigned participant numbers for confidentiality. Data was stored in a locked cabinet in a locked office, and electronic data was stored on a password-protected computer.

The guided self-reflection was administered to participants placed in the intervention group using a Google form. An equal number of high SRLs and low SRLs, as identified by the administration of the MLSQ, comprised the intervention group. These participants completed the self-reflection protocol (Appendix D) following the midterm peer feedback and final peer feedback review. The development of the self-reflection was created using a modified Gibb's model (Gibbs, 1988), and the self-reflection section allowed the participant to look back at an experience to see what may be learned and what may be changed in the future. The completion rate of the self-reflection protocol was tracked; any participant that did not complete the protocol was removed from the study.

Analytical Methods

Data were analyzed using the *IBM Statistical Package for the Social Sciences Version 28*. The four hypotheses were analyzed with a 2 x 2 factorial ANOVA, and a two-tailed test with a .05 level of significance was used for statistical analysis. Data were screened for missing values. The assumptions for factorial ANOVA, including

independent observations, normal distribution of each group's dependent variables, outliers, and homogeneity of variance, were checked. To test Hypotheses 1-4, a 2 x 2 factorial between-groups ANOVA was conducted with the learner type, as measured by the MLSQ, and participation in a protocol with a self-reflection component as the independent variables. For Hypotheses 1-4, the dependent variables were the valuation of peer feedback quality as an instructional method, confidence in submitted feedback quality, confidence in the quality of received peer feedback, and the valuation of peer feedback as an important skill.

Limitations

To better interpret the results in Chapter IV and the discussion in Chapter V, attention was drawn to the limitations of this study. First, only graduate students from the physical therapy and speech-language pathology programs at a private university in Central Arkansas were included. While these programs generally mimic the typical demographics of these fields, generalization of the results to public universities and other areas of study should be inferred with caution.

A second limitation was identifying and labeling participants as high or low SRLs. This study used graduate students in rigorous allied health programs, so the sample group was somewhat homogenous. In addition, acceptance into these programs was quite competitive and often attracted high-performing students who inherently exhibit characteristics of high SRLs. The identification of high versus low SRLs was determined by internal scoring (median) of the MLSQ. For some participants, the difference between low SR and high SRLs was 1-point. Therefore, the contrast between the two groups was not as sharp if a larger sample size allowed for a wider gap between the two categories. A

larger sample size would have allowed for the removal of the middle quartile, allowing for more substantial differentiation of the groups.

A third limitation involved the lack of training in using the guided self-reflection protocol. Due to time constraints, participants selected to complete the guided self-reflection were not given any formal training to complete the protocol; instead, a self-guided reflection was presented with written directions and explanations of the purpose. Formal training and increased explanation of the purpose may have resulted in a more significant effect on the measured dependent variables.

Fourth, some participants did not complete the self-reflection protocol as assigned. Given the already small sample size, participants who completed one self-reflection instead of the prescribed two remained in the study with their scores calculated into the analysis. This decision should be considered when interpreting scores and creating a self-reflection protocol in the team-based learning format.

Fifth, approximately half of the participants had previously been enrolled in a course using team-based learning, receiving scores and feedback on previous feedback activities. Research results have indicated that students who experience team-based learning have a greater appreciation of the learning process and agreed that team-based learning enhanced communication skills and confidence (Chhabra et al., 2017; Zulkifli et al., 2019). The previous experience with team-based learning may have inflated the scores of valuation and belief of the peer feedback process. Knowing half of the participants entered the study with previous team-based learning experience should be considered when interpreting scores.

Summary

This study consisted of four hypotheses, each tested with a 2 x 2 factorial ANOVA. The independent variables for each hypothesis were the learner type, high versus low self-regulated learner, and protocol with a self-reflection component. The independent variables for each hypothesis were valuation of peer feedback quality as an instructional method, confidence in submitted peer feedback quality, confidence in received peer feedback quality, and valuation of peer feedback as an important skill. The research sample consisted of graduate-level physical therapy and speech-language pathology students from a private university in Central Arkansas. Chapter IV applied the methods of Chapter III and provided the results for the four hypotheses by presenting the overall results of each hypothesis.

CHAPTER IV

RESULTS

The purposes of this study were to determine the effects by type of learner (low SRL versus high SRL) and participation in a guided self-reflection on perceptions on four constructs related to the valuation and belief in the peer feedback process for allied health physical therapy and speech-language pathology graduate students. The independent variables for each hypothesis were the type of learner and participation in a guided self-reflection protocol. The dependent variables, measured by the administration of the BPFQ, included valuation of peer feedback quality as an instructional method, confidence in their submitted peer feedback quality, confidence in the quality of received peer feedback, and valuation of peer feedback as an important skill. The four hypotheses were tested using 2 x 2 factorial ANOVAs on the selected population.

I used *IBM Statistical Packages for the Social Sciences (SPSS) Version 28* to analyze the data. The collected data for the four hypotheses were coded according to the type of learner and guided self-reflection participation. The following codes were used for each independent variable: SRL (0 = Low, 1 = High) and self-reflection participation (0 = No Participation, 1 = Participation). Each of the four hypotheses was then analyzed using a 2 x 2 factorial between-groups ANOVA. Scores for each of the four domains were measured using a 5-point Likert-scaled from 1 (completely disagree) to 5 (completely agree) for the scales valuation of peer feedback as an instructional method

and valuation of peer feedback as an important skill. The labels ranged from 1 (completely not applicable to me) to 5 (completely applicable to me) for the scale's confidence in own peer feedback and confidence in the quality of received peer feedback. Reverse scoring was used on one question. Histograms were used to check assumptions of normality. Homogeneity of variances was checked with Levene's test of variance. Assumptions of normality were checked before running the statistical test to ensure the proper test was selected for the analysis.

Hypothesis 1

Hypothesis 1 stated that no significant difference will exist by type of learner between those participating in and not participating in a guided self-reflection protocol on their valuation of peer feedback quality as an instructional method as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. A 2 x 2 factorial ANOVA was conducted on the participants' responses to the BPFQ instrument. Before the factorial ANOVA analysis, the data were examined for missing values and entry errors. Data were also screened for outliers and the assumptions of independence of observations, assumptions of normality, and homogeneity of variances. Descriptive statistics and inferential results were also reviewed. Table 1 displays the group means and standard deviations for participant responses by type of learner and guided self-reflection participation.

Table 1

Means, Standard Deviations, and Number for Type of Learner and Guided Self-Reflection Participation

	Guided Self-Reflection Participation								
	Participation			No Participation			Total		
Learner	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
High SRL	16.71	2.43	28	16.44	2.04	27	16.58	2.23	55
Low SRL	16.41	3.01	34	15.32	3.30	22	15.98	3.14	56
Total	16.55	2.74	62	15.94	2.71	49			

Note. Learner = Type of Learner; High SRL = High Self-Regulated Learner; Low SRL = Low Self-Regulated Learner.

The skewness values for the low SRL group with no guided self-reflection was -1.03, and kurtosis was 0.48. The skewness values for low SRL and participation in guided self-reflection was -0.79, and kurtosis was 0.49. The skewness for high SRL and no participation in the guided self-reflection was -0.60, and kurtosis was 0.18. For the high SRL group who participated in the guided self-reflection, the skewness was -1.04, and kurtosis was 1.48. The Shapiro Wilks test was used to test for normality in the four groups (low SRL with no guided self-reflection, $p = .017$; low SRL with guided self-reflection, $p = .016$; high SRL with no guided self-reflection, $p = .104$; high SRL with participation in guided self-reflection, $p = .015$). All groups except the high SRL and no participation in guided self-reflection violated the assumption of normality. Although these abnormalities existed with the data, the factorial ANOVA was robust to violations of normality (Leech, Barrett, & Morgan 2015). No extreme outliers were present.

Levene's test of equality of variances was conducted within the ANOVA, and the test indicated that homogeneity of variances across the groups could be assumed, $F(3, 107) = 2.22$, $p = .090$; therefore, this assumption was not violated. The results of the factorial ANOVA analysis are displayed in Table 2.

Table 2

Factorial Analysis of Variance Results for Valuation of Peer Feedback as an Instruction Method by Type of Learner and Participation and No Participation in a Guided Self-Reflection

Source	*SS*	*df*	*MS*	*F*	*p*	*ES*
Learner	13.83	1	13.83	1.86	.175	0.017
GS-R Part.	12.59	1	12.59	1.69	.196	0.016
Learner*GS-R Part.	4.60	1	4.60	0.62	.433	0.006
Error	795.39	107	7.43			

Note. Learner = Type of Learner; GS-R Part. = Guided Self-Reflection Participation.

Results of the factorial ANOVA analysis revealed no significant interaction between type of learner and participation in a guided self-reflection protocol, $F(1, 107) = 0.62$, $p = .433$, $ES = 0.006$. The data indicated that the type of learner and participation in a guided self-reflection protocol did not significantly affect the participants' valuation of peer feedback as an instruction method. Since no significant interaction effect existed, the main effects were examined separately. No significant effect was indicated by type of learner, $F(1, 107) = 1.86$, $p = .175$, $ES = 0.017$, or participation in a guided self-reflection protocol, $F(1, 107) = 1.69$, $p = .196$, $ES = 0.016$. The means of valuation of peer feedback

as an instructional method scores by type of learner and participation in a guided self-reflection are shown in Figure 2.

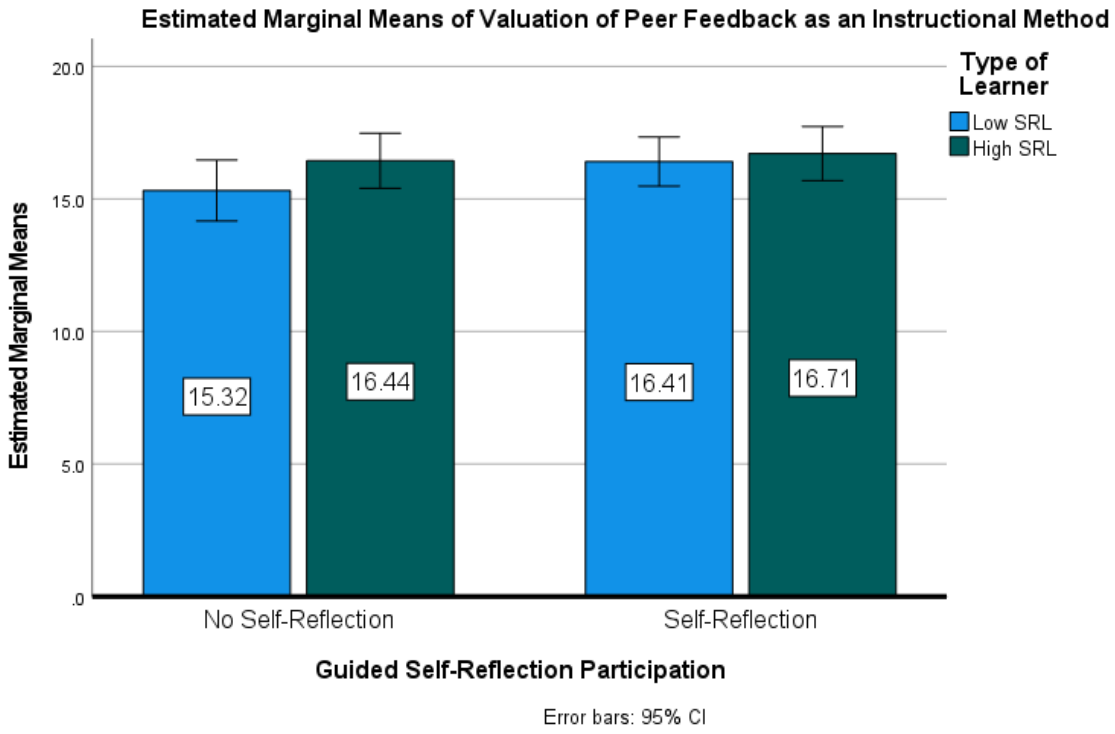


Figure 2. Means for valuation of peer feedback quality as an instructional method by type of learner and participation and no participation in a guided self-reflection.

Regarding the main effect results, the mean of the valuation of peer feedback as an instructional method was highest for the high SRL with participation in a guided self-reflection (M = 16.58, SD = 2.23), but the difference was not significant compared to the mean of the low SRL (M = 15.98, SD = 3.14), regardless of guided self-reflection participation. Similarly, although the mean for the group participating in the guided self-reflection (M = 16.55, SD = 2.74) was higher than the nonparticipation group (M = 15.94, SD = 2.71), no significant difference existed, regardless of learner type. The results

indicated no combined or individual effect of type of learner or participation in a guided self-reflection on participants' valuation of peer feedback as an instructional method. Therefore, the null hypotheses for the interaction effect and the two main effects were retained.

Hypothesis 2

Hypothesis 2 stated that no significant difference will exist by type of learner between those participating in and not participating in a guided self-reflection protocol on their confidence in their submitted peer feedback quality as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. A 2 x 2 factorial ANOVA was conducted on the participants' responses to the BPFQ instrument. Before the factorial ANOVA analysis, the data were examined for missing values and entry errors. Data were also screened for outliers and the assumptions of independence of observations, assumptions of normality, and homogeneity of variances. Descriptive statistics and inferential results were also reviewed. Table 3 displays the group means and standard deviations for participant responses by type of learner and guided self-reflection participation.

Table 3

Means, Standard Deviations, and Number for Type of Learner and Guided Self-Reflection Participation

	Guided Self-Reflection Participation								
	Participation			No Participation			Total		
Learner	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
High SRL	16.71	2.43	28	16.44	2.04	27	16.58	2.23	55
Low SRL	16.41	3.01	34	15.32	3.30	22	15.98	3.14	56
Total	16.55	2.74	62	15.94	2.71	49			

Note. Learner = Type of Learner; High SRL = High Self-Regulated Learner; Low SRL = Low Self-Regulated Learner.

The skewness values for the low SRL group with no guided self-reflection was 0.84, and kurtosis was -0.34. The skewness values for low SRL and participation in guided self-reflection was -1.12, and kurtosis was 1.59. The skewness for high SRL and no participation in the guided self-reflection was -0.16, and kurtosis was -1.02. For the high SRL group who participated in the guided self-reflection, the skewness was -0.05, and kurtosis was 0.43. The Shapiro Wilks test was used to test for normality in the four groups (low SRL with no guided self-reflection, $p = .004$; low SRL with guided self-reflection, $p = .002$; high SRL with no guided self-reflection, $p = .014$; high SRL with participation in guided self-reflection, $p = .006$). All groups violated the assumption of normality. Although these abnormalities existed with the data, the factorial ANOVA was robust to violations of normality (Leech et al., 2015). No extreme outliers were present. Levene's test of equality of variances was conducted within the ANOVA, and the test

indicated that homogeneity of variances across the groups could be assumed, $F(3, 107) = 2.22$, $p = .091$; therefore, this assumption was not violated. The results of the factorial ANOVA analysis are displayed in Table 4.

Table 4

Factorial Analysis of Variance Results for Confidence in Own Feedback by Type of Learner and Participation and No Participation in a Guided Self-Reflection

Source	*SS*	*df*	*MS*	*F*	*p*	*ES*
Learner	15.52	1	15.52	7.93	.006	0.069
GS-R Part.	6.33	1	6.33	3.24	.075	0.029
Learner*GS-R Part.	3.97	1	3.97	2.03	.157	0.019
Error	209.48	107	1.96			

Note. Learner = Type of Learner; GS-R Part. = Guided Self-Reflection Participation.

Results of the factorial ANOVA analysis revealed no significant interaction between type of learner and participation in a guided self-reflection protocol, $F(1, 107) = .2.03$, $p = .157$, $ES = 0.019$. The data indicated that the type of learner and participation in a guided self-reflection protocol did not significantly affect the participants' confidence in own feedback. Since no significant interaction effect existed, the main effects were examined separately. No significant effect was indicated for participation in a guided self-reflection protocol, $F(1, 107) = 3.24$, $p = .075$, $ES = 0.029$. However, a significant effect was indicated by type of learner, $F(1, 107) = 7.93$, $p = .006$, $ES = 0.069$, which is a medium effect size. The means of confidence in their submitted peer feedback quality

scores by type of learner and participation in a guided self-reflection are shown in Figure 3.

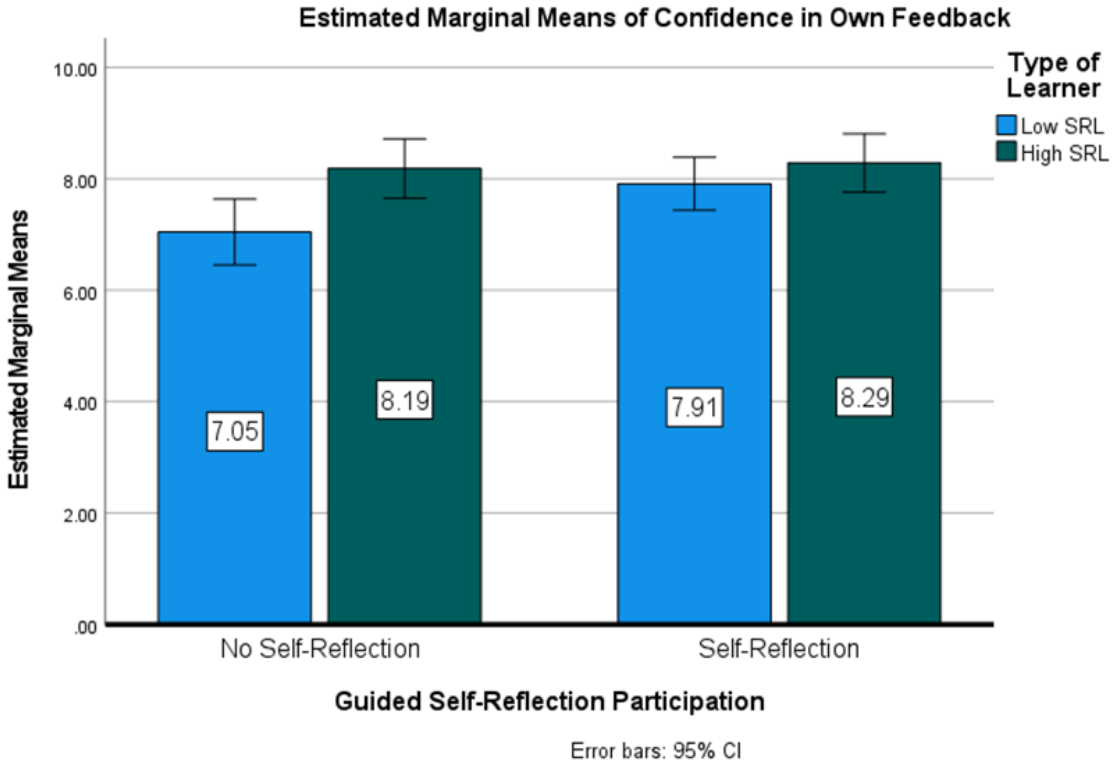


Figure 3. Means for confidence in their submitted peer feedback by type of learner and participation and no participation in a guided self-reflection.

Regarding the main effect results, the mean of confidence in their submitted peer feedback quality was higher, but not significant, in the guided self-reflection group (M = 8.08, SD = 1.38) compared to the mean of participants who did not participate in the guided self-reflection (M = 7.67, SD = 1.52), regardless of the type of learner. In contrast, the mean confidence in their submitted peer feedback quality was significantly higher in the high SRL group (M = 8.24, SD = 1.15) compared to the low SRL group (M = 7.57, SD = 1.64). The analysis results indicated no combined effect of type of learner and

participation in the self-reflection on participants' confidence in their submitted peer feedback quality or individual effect of participation in guided self-reflection. However, type of learner did show a significant effect on confidence in own feedback. Therefore, the null hypotheses for the interaction effect and the one main effect were retained, and the main effect hypothesis for the type of learner was rejected.

Hypothesis 3

Hypothesis 3 stated that no significant differences will exist by type of learner between students participating in and not participating in a guided self-reflection protocol on their confidence in the quality of received peer feedback as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. A 2 x 2 factorial ANOVA was conducted on the participants' responses to the BPFQ instrument. Before the factorial ANOVA analysis, the data were examined for missing values and entry errors. Data were also screened for outliers and the assumptions of independence of observations, assumptions of normality, and homogeneity of variances. Descriptive statistics and inferential results were also reviewed. Table 5 displays the group means and standard deviations for participant responses by type of learner and guided self-reflection participation.

Table 5

Means, Standard Deviations, and Number for Type of Learner and Guided Self-Reflection Participation

	Guided Self-Reflection Participation								
	Participation			No Participation			Total		
Learner	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
High SRL	8.57	1.14	28	8.07	1.04	27	8.33	1.11	55
Low SRL	8.12	1.74	34	7.50	1.65	22	7.88	1.72	56
Total	8.32	1.50	62	7.82	1.36	49			

Note. Learner = Type of Learner; High SRL = High Self-Regulated Learner; Low SRL = Low Self-Regulated Learner.

The skewness values for the low SRL group with no guided self-reflection was -0.97, and kurtosis was 0.27. The skewness values for low SRL and participation in guided self-reflection was -0.86, and kurtosis was 0.12. The skewness for high SRL and no participation in the guided self-reflection was -0.38, and kurtosis was 2.45. For the high SRL group who participated in the guided self-reflection, the skewness was -0.19, and kurtosis was -0.68. The Shapiro Wilks test was used to test for normality in the four groups (low SRL with no guided self-reflection, $p = .007$; low SRL with guided self-reflection, $p = .002$; high SRL with no guided self-reflection, $p = < .001$; high SRL with participation in guided self-reflection, $p = .004$). All groups violated the assumption of normality. Although these abnormalities existed with the data, the factorial ANOVA was robust to violations of normality (Leech et al., 2015). Levene's test of equality of variances was conducted within the ANOVA, and homogeneity was significant;

therefore, the assumption was violated, $F(3, 107) = 3.90$, $p = .011$. A total of 10 extreme outliers were present in the high SRL with no participation in the guided self-reflection group; however, these responses were needed for the analysis. A possible explanation for the outliers included lack of robustness for this construct on the instrument, a lack of range in the scores, or participant desire to please the instructor. Results should be interpreted with caution. The results of the factorial ANOVA analysis are displayed in Table 6.

Table 6

Factorial Analysis of Variance Results for Confidence in Received Feedback by Type of Learner and Participation and No Participation in a Guided Self-Reflection

Source	*SS*	*df*	*MS*	*F*	*p*	*ES*
Learner	7.16	1	7.16	3.49	.065	0.032
GS-R Part.	8.42	1	8.42	4.10	.045	0.037
Learner*GS-R Part.	0.10	1	0.10	0.05	.827	0.000
Error	219.74	107	2.05			

Note. Learner = Type of Learner; GS-R Part. = Guided Self-Reflection Participation.

Results of the factorial ANOVA analysis revealed no significant interaction between type of learner and participation in a guided self-reflection protocol, $F(1, 107) = 0.05$, $p = .827$, $ES = 0.000$. The data indicated that the type of learner and participation in a guided self-reflection protocol did not significantly affect the participants' confidence in the quality of received peer feedback. Since no significant interaction effect existed, the main effects were examined separately. No significant effect was indicated by type of

learner, $F(1, 107) = 3.49$, $p = .065$, $ES = 0.032$. However, a significant effect was indicated by participation in a guided self-reflection, $F(1, 107) = 4.10$, $p = .045$, $ES = 0.037$, with a small effect size. The means of confidence in the quality of received peer feedback scores by type of learner and participation in a guided self-reflection are shown in Figure 4.

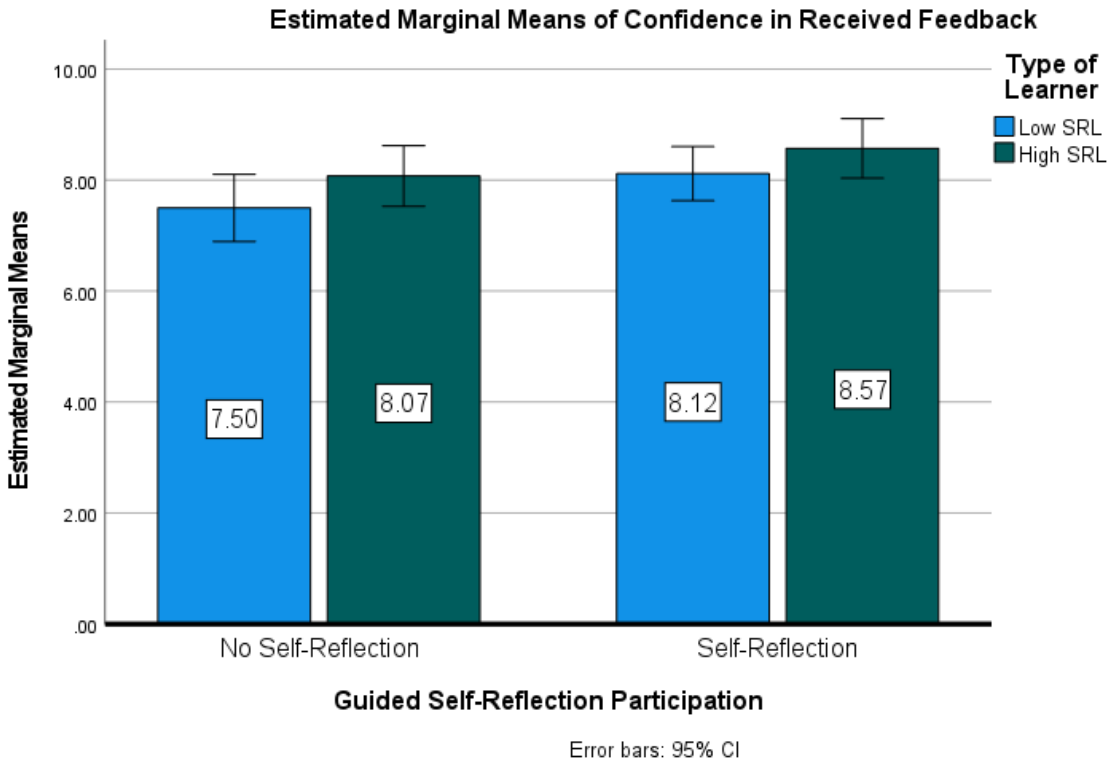


Figure 4. Means for confidence in the quality of received peer feedback by type of learner and participation and no participation in a guided self-reflection.

Regarding the main effect results, the mean of the confidence in the quality of received peer feedback scores was higher, but not significantly, in the high SRL group ($M = 8.33$, $SD = 1.11$) compared to the mean of those in the low SRL group ($M = 7.88$, $SD =$

1.72). In contrast, the mean of the confidence in the quality of received peer feedback was significantly higher in the group participating in the guided self-reflection (M = 8.32, SD = 1.50) compared to the group that did not participate (M = 7.82, SD = 1.36). The analysis results indicated no combined effect of type of learner and participation in the self-reflection on participants confidence in the quality of received peer feedback or individual effect by type of learner. However, participation in the guided self-reflection did show a significant effect on confidence in received feedback. Therefore, the null hypotheses for the interaction effect and the one main effect were retained, and the main effect hypothesis for the participation in the guided self-reflection was rejected.

Hypothesis 4

Hypothesis 4 stated that no significant differences will exist by type of learner between students participating in and not participating in a guided self-reflection protocol on their valuation of peer feedback as an important skill as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. A 2 x 2 factorial ANOVA was conducted on the participants' responses to the BPFQ instrument. Before the factorial ANOVA analysis, the data were examined for missing values and entry errors. Data were also screened for outliers and the assumptions of independence of observations, assumptions of normality, and homogeneity of variances. Descriptive statistics and inferential results were also reviewed. Table 7 displays the group means and standard deviations for participant responses by type of learner and guided self-reflection participation.

Table 7

Means, Standard Deviations, and Number for Type of Learner and Guided Self-Reflection Participation

	Guided Self-Reflection Participation								
	Participation			No Participation			Total		
Learner	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
High SRL	14.61	0.96	28	14.37	1.04	27	14.49	1.00	55
Low SRL	14.56	1.02	34	14.09	1.38	22	14.38	1.18	56
Total	14.58	0.98	62	14.24	1.20	49			

Note. Learner = Type of Learner; High SRL = High Self-Regulated Learner; Low SRL = Low Self-Regulated Learner.

The skewness values for the low SRL group with no guided self-reflection was -1.74, and kurtosis was 2.61. The skewness values for low SRL and participation in guided self-reflection was -2.08, and kurtosis was 2.69. The skewness for high SRL and no participation in the guided self-reflection was -1.49, and kurtosis was 0.90. For the high SRL group who participated in the guided self-reflection, the skewness was -2.38, and kurtosis was 4.36. The Shapiro Wilks test was used to test for normality in the four groups (low SRL with no guided self-reflection, $p = < .001$; low SRL with guided self-reflection, $p = < .001$; high SRL with no guided self-reflection, $p = < .001$; high SRL with participation in guided self-reflection, $p = < .001$). All groups violated the assumption of normality. Although these abnormalities existed with the data, the factorial ANOVA was robust to violations of normality (Leech et al., 2015). Levene's test of equality of variances was conducted within the ANOVA, and the test indicated that

homogeneity of variances across the groups could be assumed, $F(3, 107) = 1.05$, $p = .372$; therefore, this assumption was not violated. One extreme outlier in the low SRL with no guided self-reflection participation group existed, five present in the low SRL with guided self-reflection group, and five in the high SRL with guided self-reflection participation group. The researcher decided not to remove these extreme outliers as they were needed for the analysis. A possible explanation for the outliers includes lack of robustness for this construct on the instrument, a lack of range in the scores, or participant desire to please the instructor. Results should be interpreted with caution. The results of the factorial ANOVA analysis are displayed in Table 8.

Table 8

Factorial Analysis of Variance Results for Valuation of Peer Feedback as an Important Skill by Type of Learner and Participation and No Participation in a Guided Self-Reflection

Source	*SS*	*df*	*MS*	*F*	*p*	*ES*
Learner	0.73	1	0.73	0.61	.436	0.006
GS-R Part.	3.36	1	3.36	2.83	.095	0.026
Learner*GS-R Part.	0.36	1	0.36	0.31	.582	0.003
Error	127.18	107	1.19			

Note. Learner = Type of Learner; GS-R Part. = Guided Self-Reflection Participation.

Results of the factorial ANOVA analysis revealed no significant interaction between type of learner and participation in a guided self-reflection protocol, $F(1, 107) = 0.31$, $p = .582$, $ES = 0.003$. The data indicated that the type of learner and participation in

a guided self-reflection protocol did not significantly affect the participants' valuation of peer feedback as an important skill. Since no significant interaction effect existed, the main effects were examined separately. No significant effect was indicated by type of learner, $F(1, 107) = 0.61$, $p = .436$, $ES = 0.006$, or by participation in the guided self-reflection, $F(1, 107) = 2.83$, $p = .095$, $ES = 0.026$. The means of valuation of peer feedback as an important skill score by type of learner and participation in a guided self-reflection are shown in Figure 5.

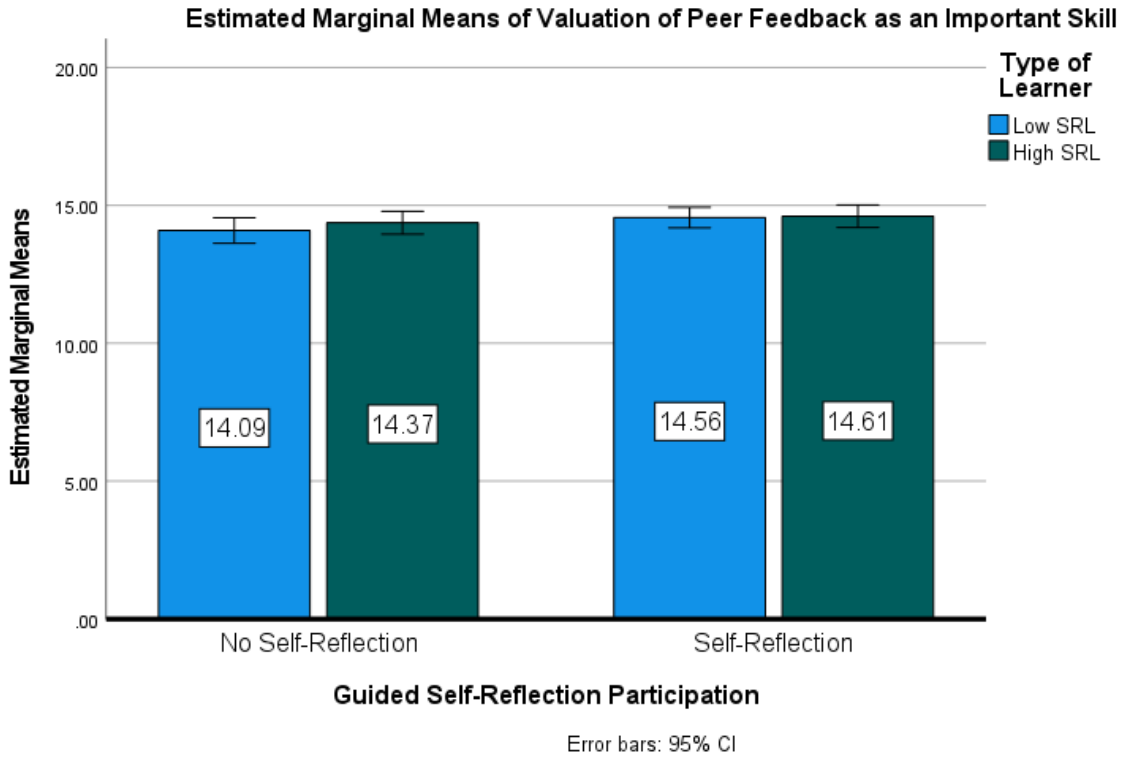


Figure 5. Means for valuation of peer feedback as an important skill and participation or no participation in a guided self-reflection

Regarding the main effect results, the mean of the valuation of peer feedback as an important skill score was higher, but not significantly, in the high SRL group (M =

14.49, *SD* = 1.00) compared to the mean of those in the low SRL group (*M* = 14.38, *SD* = 1.18). Similarly, the mean of the valuation of peer feedback as an important skill score was higher, but not significantly, in the participation in guided self-reflection group (*M* = 14.58, *SD* = 0.98) compared to the mean of those who did not participate in the guided self-reflection (*M* = 14.24, *SD* = 1.20). The analysis results indicated no combined or individual effect by type of learner and participation in the self-reflection on participants' valuation of peer feedback as an important skill. Therefore, the null hypotheses for the interaction effect and the main effects were retained.

Summary

The purpose of this study was to determine the effects by type of learner and guided self-reflection protocol participation on four constructs associated with the belief and valuation of a peer feedback protocol, each measured by the BPFQ. These four constructs, identified by Huisman et al. (2019), included valuation of peer feedback quality as an instructional method, confidence in their submitted feedback, confidence in the quality of received peer feedback, and valuation of peer feedback as an important skill. The four hypotheses were tested using 2 x 2 factorial ANOVAs on physical therapy and speech-language pathology graduate students. The independent variables for each hypothesis were type of learner and participation in a guided self-reflection protocol. Table 9 summarizes the results of the interaction and main effects for each of the four hypotheses.

Table 9

Summary of Statistical Significance of Type of Learner and Participation in a Self-Reflection Protocol on Valuation and Beliefs of Peer Feedback by Hypothesis

Variables by H_0	H1	H2	H3	H4
Learner	.175	.006	.065	.436
GS-R Part.	.196	.075	.045	.095
Learner*GS-R Part.	.433	.157	.827	.582

Note. Learner = Type of Learner; GS-R Part. = Guided Self-Reflection Participation.

No significant interaction between type of learner and participation in a guided self-reflection protocol on participants' valuation and belief in the peer feedback process existed for any of the four hypotheses. For Hypotheses 2, a significant main effect of type of learner on confidence in own feedback existed, but the effect size was small. High SRL students significantly outscored, in general, the low SRL students. For Hypothesis 3, a significant main effect of participation in the guided self-reflection on the confidence in the quality of received peer feedback existed, with a small effect size. In general, students participating in the guided self-reflection protocol outscored those not participating. Chapter V will include a discussion of the findings for each hypothesis and a discussion of the implications for practice and further research.

CHAPTER V

DISCUSSION

To effectively practice in a competitive job market, students in the allied health fields should be independent lifelong learners with adequate soft skills, in addition to discipline-specific technical skills. The allied health professions are dynamic and ever-changing, requiring practitioners to engage in continued education and collaboration (American Speech-Language and Hearing Association, 2020; Commission on Accreditation in Physical Therapy Education, 2021; World Health Organization, 2010). Although many instructors choose not to include pedagogical strategies to address soft skills (de la Harpe & Radloff, 2000; Panadero et al., 2016), instructors of these students should be equipped to infuse evidence-based pedagogical practices to prepare their students for the workforce. Not addressing soft skills in allied health programs creates a gap between the didactic and clinical experience resulting in ill-prepared practitioners. A demanding field and an ever-changing job market drive the need for addressing soft skills and lifelong learning strategies in allied health programs.

Providing and receiving feedback are teachable soft skills linked to high self-regulation abilities. In addition, the practice of self-reflection contributes to the development of self-efficacy, confidence, and lifelong learning (Korucu & Kartal, 2019; Boud, 2020; Schon, 1983) and is standard practice in healthcare settings (Bindels et al., 2018; Boud, 1995; Georgia et al., 2017; Koshy et al., 2017; Robert et al., 2018). Since

students entering the allied health workforce are expected to be equipped with soft skills of collaboration and lifelong learning, programs are obligated to provide evidence-based best practice pedagogy to target this objective. Students who understand the merits of a particular learning activity and experience the benefits will value the objective and are more motivated to obtain the skill. The use of self-reflection, especially for students with low SRL skills, provides a structured means to increase understanding of the benefits of peer feedback and thereby increase their valuation, leading to acquired soft skills.

A learning experience is most advantageous if the student feels value in the task. Students with high SRL approach most learning activities with effective strategies and motivation (Nilson, 2013). Students with low SRL require additional support with metacognitive skills such as self-assessment and motivation (Pintrich, 2005). Improving self-regulation skills provides a foundation for successful learning. This research was conducted to determine by the type of learner and participation in a self-reflection protocol the effects on students' valuation and beliefs in a peer feedback process as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. This chapter summarizes four hypotheses and descriptive statistics for the constructs measured. The implications of self-reflection on the measured constructs and the reviewed research will be discussed. Last, recommendations are provided for instructors in allied health programs when creating peer feedback protocols.

Findings and Implications

The focus of this study was to determine the effect of participation in a self-reflection protocol by type of learner, high SRL versus low SRL, on students' valuations

and beliefs in the peer feedback process. Four 2 x 2 factorial ANOVAs were conducted to measure the data for the four hypotheses. The independent variables for the four hypotheses included type of learner and participation in a guided self-reflection protocol. The dependent variables for the hypotheses were as follows: Hypothesis 1—valuation of peer feedback as an instructional method, Hypothesis 2—confidence in their submitted peer feedback quality, Hypothesis 3—confidence in the quality of received peer feedback, and Hypothesis 4—valuation of peer feedback as an important skill. The administration of the BPFQ was used to measure the dependent variable for each hypothesis.

Hypothesis 1—Valuation of Peer Feedback as an Instructional Method

Hypothesis 1 stated that no significant difference will exist by type of learner between those participating in and not participating in a guided self-reflection protocol on their valuation of peer feedback as an instructional method as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. Data analysis revealed that the type of learner and participation in the guided self-reflection protocol did not combine to affect participants' valuation of peer feedback as an instructional method. Similarly, neither type of learner nor participation in a guided self-reflection showed a significant individual effect on participants' valuation of peer feedback as an instructional method.

Half of the study's participants had previously been enrolled in a team-based learning course. The previous participation in a team-based learning course may have inflated peer feedback valuation scores as an instructional method. Students who have experienced a course taught using team-based learning pedagogy reported increased

satisfaction, improved learning, enriched communication, collaboration skills, and self-efficacy (Chhabra et al., 2017; Zulkifli et al., 2019). Research was clear regarding the significance of training in giving and receiving feedback to ensure the most effective feedback process (Li et al., 2016; Michaelsen & Schultheiss, 1989). Every participant completed a tutorial on giving and receiving feedback and the value of feedback. The completion of this tutorial may have affected valuation scores of peer feedback as an instructional method. Last, participants in this research may have answered questions with a social desirability bias wishing to please their instructor and researcher. While no significant effect by type of learner or participation in a guided self-reflection protocol existed, overall mean scores indicated a high valuation of peer feedback as an instructional method. Scores should be interpreted with caution and with the given context.

Hypothesis 2—Confidence in Their Submitted Peer Feedback Quality

Hypothesis 2 stated that no significant differences will exist by type of learner between students participating in and not participating in a guided self-reflection protocol on their confidence in their submitted peer feedback quality as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. Data analysis revealed that the type of learner and participation in the guided self-reflection protocol did not combine to affect participants' confidence in their submitted peer feedback quality. Participation in a guided self-reflection protocol did not have a significant individual effect on confidence in their submitted peer feedback quality; however, a significant effect was found by type of

learner. Participants identified as high SRL had a significantly higher mean score for confidence in their submitted peer feedback than participants identified as low SRL.

These data could indicate that students with high SRL feel they are better equipped to provide peer feedback due to the link between self-regulated skills and feedback administration (Topping, 2017). In addition, the feedback process in the researched team-based learning courses was associated with a grade but comprised a small percentage of the overall course grade. Students with low SRL are less likely to invest time into learning tasks that are not associated with high stakes or directly related to learning hard skills (Bandura, 1997). High SRL students reported higher confidence in their ability to provide quality peer feedback, which is congruent with the reviewed research in SRL. Measured data from participants in this research study revealed significantly higher scores in the construct of confidence in their submitted peer feedback compared to the low SRL group.

Hypothesis 3—Confidence in the Quality of Received Peer Feedback

Hypothesis 3 stated that no significant differences will exist by type of learner between students participating in and not participating in a guided self-reflection protocol on their confidence in the quality of received peer feedback as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. Data analysis revealed that the type of learner and participation in the guided self-reflection protocol did not combine to affect participants' confidence in the quality of received peer feedback. Type of learner did not have a significant individual effect on confidence in their submitted peer feedback quality; however, a significant effect was found for those who participated in a guided self-

reflection protocol. Participants in the guided self-reflection protocol had a significantly higher mean score for confidence in the quality of received peer feedback than participants who did not participate in the guided self-reflection. These data might indicate that completing a guided self-reflection allowed the participant a formal means to evaluate and implement the provided feedback, thus contributing to increased confidence in the quality of the received feedback. The self-regulated learning activity of self-reflection allows individuals to measure their performance through feedback from others and themselves (Schunk & Zimmerman, 1998; Zimmerman & Moylan, 2009). The self-reflection protocol may have compelled the participants to read and comprehend the feedback more methodically than those who did not have to complete the guided self-reflection, thereby increasing valuation in the provided feedback.

Hypothesis 4—Valuation of Peer Feedback as an Important Skill

Hypothesis 4 stated that no significant differences will exist by type of learner between students participating in and not participating in a guided self-reflection protocol on their valuation of peer feedback as an important skill as measured by the BPFQ for graduate physical therapy and speech-language pathology students in a private university located in Central Arkansas. Data analysis revealed that the type of learner and participation in the guided self-reflection protocol did not combine to affect participants' valuation of peer feedback as an important skill. Similarly, neither type of learner nor participation in a guided self-reflection indicated a significant individual effect on the participant's valuation of peer feedback as an important skill. The participants in this study were all enrolled in a course using team-based learning, and approximately half had previously taken a course using team-based learning. Therefore, these students had

already experienced the advantages of collaboration and feedback. The mean scores were high for the four groups on valuation of peer feedback as an important skill, indicating all participants valued peer feedback. Peters et al. (2020) argued that students in team-based learning had a greater appreciation of the learning process and demonstrate superior learning outcomes than those in a non-team-based learning course. In addition, corroborative findings reported by Chhabra et. al., (2017) and Zulkifli et. al., (2019) found that students were highly satisfied by with the outcomes of TBL, including enhanced learning, improved communication skills, and increased self-confidence.

Recommendations

Potential for Practice/Policy

This study investigated differences by type of learner and participation in a guided self-reflection on students' beliefs and valuations of the peer review process in a course taught with team-based learning. The findings revealed no combined differences of the independent variables on the dependent variables. Two main effects were significant, one by type of learner and the other by participation in a guided self-reflection. Based on these findings, the following recommendations are presented to inform best practices in creating and executing a peer feedback protocol for allied health graduate students to target soft skills and lifelong learning.

The first recommendation for instructors of allied health programs is to target soft skills of communication, collaboration, and other SRL skills in addition to the hard skills of the field. Despite the clear message from research and employers of the importance of soft skill development, many instructors and programs still do not infuse soft skill development throughout their curriculum (Panadero et al., 2016; Zimmerman, 2002).

Students and society benefit from implicit teaching of soft skills and lifelong learning strategies. Pedagogical practices such as team-based learning, which implicitly infuse peer feedback, provide a structure to teach and practice the constructs known to contribute to successful learning, soft skill development, and lifelong learning (Brooks & Ammons, 2003; Nilson, 2013; Parmelee, 2008; Topping, 2017). By intentionally targeting soft skills, students are better equipped to meet the demands of an ever-changing workforce while practicing at the top of their license. Targeting hard skills in an allied health program is not enough to equip students for success in these fields.

A second recommendation for instructors in allied health programs is to teach and practice the process of peer feedback. Peer feedback activities, when implemented appropriately, increase study motivation, self-efficacy, and a better understanding of the subject (Mentzer et al., 2016; Searby & Ewers, 1997; Topping, 2017). Students entering the allied health professions will be required to evaluate the performance of their peers and themselves. Teaching effective feedback protocols enhances the soft skills needed for successful practice in allied health.

The third recommendation for instructors in allied health programs is to teach and practice self-reflection. When considering the findings that self-reflection has on students' confidence in the quality of received peer feedback, self-reflection may increase the value and belief of the peer feedback process, thereby increasing motivation to maintain a practice of self-reflection. Allied health students are entering a field in which self-reflection and self-assessment are becoming standard practice because of the known benefits to individual and team performance (Bindels et al., 2018; Boud, 1995; Georgia et al., 2017; Koshy et al., 2017; Robert et al., 2018). Providing a low-stakes environment to

learn and practice the skill of self-reflection prepares these students for the demands of the workplace. The use of evidence-based pedagogical approaches includes self-regulated learning activities such as self-reflection.

A final recommendation to be considered at the university level, regardless of major or program is to consider identifying students with low SRL. Regarding the findings of this research, students with high SRL have a higher level of confidence in the quality of their given peer feedback. In addition, a review of the literature conveys the interrelationship between self-regulated learning skills with successful learning and lifelong learning. The supposition is that self-regulated learning skills can be taught and learned. By identifying students lacking self-regulated learning skills, instructors can intervene in such a way to increase the self-regulated learning skills, thereby preparing these students to keep up with the growth of knowledge and soft skills inherent in the allied health professions.

Future Research Considerations

Although no significant combined effect by type of learner and participation in a guided self-reflection existed, a significant main effect was discovered between the type of learner on confidence in submitted peer feedback and the participation in a guided self-reflection on confidence in the quality of received feedback. Some of the findings of this research supported the literature suggesting that high SRLs are more confident in identifying behaviors associated with successful learning and behaviors that are barriers to learning. In addition, the findings of this research align with the literature in terms of the benefits of self-reflection. Additional research is recommended in the following areas:

1. To better control bias, future research on the effects of self-reflection on peer feedback protocols should be conducted with a larger number of participants who have not previously been involved with a peer feedback protocol.
2. Researchers should conduct a similar study using a more robust instrument to better measure the effects of self-reflection on the peer feedback process and differentiate between groups.
3. Future research should consider replicating a similar study outside the allied health fields to understand better the role of self-reflection in improving self-regulated learning skills in other areas of education.
4. Additional research could be conducted exploring the role of gender, race, and age on students' valuation and belief in peer feedback and self-reflection.
5. Future research should consider replicating a similar study across university majors and programs to better understand a broader perspective on peer feedback and the effect peer feedback may have on student and program outcomes.

Conclusion

To date, little research has been conducted to address the perception of peer feedback by students, especially in allied health education. Additional research comparing results is needed to direct best practices and protocols in teaching and using peer feedback (Zundert et al., 2010). Due to the heterogeneous nature of peer feedback protocols, understanding the students' perceived beliefs and values is difficult to measure. This study aimed to add to the literature regarding best practices in peer feedback protocol. Specifically, this study measured the effect of type of learner and

participation in a self-reflection protocol on participants' valuation and confidence in a peer feedback process within the context of allied health courses using team-based learning. Students with high SRL were more confident in their submitted peer feedback, and students who completed a guided self-reflection protocol were more confident in the quality of their received peer feedback.

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APPENDIX A

Participant Permission Letter

You are invited to participate in a research study on the effects of self-reflection on the valuation and beliefs of peer feedback. This is a research project being conducted by Jennifer Fisher a doctoral student at Harding University. Participation in this research study will require around 2-3 hours of your time. As a participant you will be asked to complete two separate questionnaires, complete a short on-line module about how to give and receive feedback and, if chosen complete a self-reflection activity. You were chosen to participate in this study because you are enrolled in a graduate level allied health course utilizing Team-Based Learning.

Your participation in this research is voluntary. You may refuse to take part in the research or end your participation at any time without penalty. You are free to decline to answer any particular question you do not wish to answer for any reason. You will receive no direct benefits from participating in this research study. However, your responses may help us learn more about effective peer feedback design.

There are **no** foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

The questionnaires will be administered on paper and your responses will be kept confidential and only identifiable by the principal investigator. All data will be deidentified after data collection. If you are chosen to participate in the self-reflection activity you will complete this through a Canvas course and responses will be kept confidential except for the principal investigator.

If you feel you have not been treated according to the descriptions in this form, or that your rights as a participant in research have not been honored during the course of this project, or you have any questions, concerns, or complaints that you wish to address to someone other than the investigator, you may contact Harding University's Institutional Review Board at irb@harding.edu.

Please select your choice below. Marking "I Agree" indicates that

- You have read the above information
- You voluntarily agree to participate
- You are 18 years of age or older

☐ I Agree ☐ I Disagree

_____

Print Name and Date

_____

Signed Name

APPENDIX B

Demographic Information

Identification number _____

1. Gender (circle one).

Male

Female

Prefer not to answer

2. Ethnic background (circle one).

Caucasian

African-American

Latino or Hispanic

Asian

Native American

Native Hawaiian or Pacific Islander

Two or More

Other/Unknown

Prefer not to say

3. Age _____

1. When I study the readings for this course, I outline the material to help me organize my thoughts.

   1 2 3 4 5 6 7

2. During class time I often miss important points because I'm thinking of other things.

   1 2 3 4 5 6 7

3. When studying for this course, I often try to explain the material to a classmate or friend.

   1 2 3 4 5 6 7

4. I usually study in a place where I can concentrate on my course work.

   1 2 3 4 5 6 7

5. When reading for this course, I make up questions to help focus my reading.

   1 2 3 4 5 6 7

6. I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do.

   1 2 3 4 5 6 7

7. I often find myself questioning things I hear or read in this course to decide if I find them convincing.

   1 2 3 4 5 6 7

8. When I study for this class, I practice saying the material to myself over and over.

   1 2 3 4 5 6 7

9. Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone.

   1 2 3 4 5 6 7

10. When I become confused about something I'm reading for this class, I go back and try to figure it out.

    1 2 3 4 5 6 7

11. When I study for this course, I go through the readings and my class notes and try to find the most important ideas.

1 2 3 4 5 6 7

12. I make good use of my study time for this course.

1 2 3 4 5 6 7

13. If course readings are difficult to understand, I change the way I read the material.

1 2 3 4 5 6 7

14. I try to work with other students from this class to complete the course assignments.

1 2 3 4 5 6 7

15. When studying for this course, I read my class notes and the course readings over and over again.

1 2 3 4 5 6 7

16. When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.

1 2 3 4 5 6 7

17. I work hard to do well in this class even if I don't like what we are doing.

1 2 3 4 5 6 7

18. I make simple charts, diagrams, or tables to help me organize course material.

1 2 3 4 5 6 7

19. When studying for this course, I often set aside time to discuss course material with a group of students from the class.

1 2 3 4 5 6 7

20. I treat the course material as a starting point and try to develop my own ideas about it.

1 2 3 4 5 6 7

21. I find it hard to stick to a study schedule.

1 2 3 4 5 6 7

22. When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions.

1 2 3 4 5 6 7

23. Before I study new course material thoroughly, I often skim it to see how it is organized.

1 2 3 4 5 6 7

24. I ask myself questions to make sure I understand the material I have been studying in this class.

1 2 3 4 5 6 7

25. I try to change the way I study in order to fit the course requirements and the instructor's teaching style.

1 2 3 4 5 6 7

26. I often find that I have been reading for this class but don't know what it was all about.

1 2 3 4 5 6 7

27. I ask the instructor to clarify concepts I don't understand well.

1 2 3 4 5 6 7

28. I memorize key words to remind me of important concepts in this class.

1 2 3 4 5 6 7

29. When course work is difficult, I either give up or only study the easy parts.

1 2 3 4 5 6 7

30. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this course.

1 2 3 4 5 6 7

31. I try to relate ideas in this subject to those in other courses whenever possible.

1 2 3 4 5 6 7

32. When I study for this course, I go over my class notes and make an outline of important concepts.

1 2 3 4 5 6 7

33. When reading for this class, I try to relate the material to what I already know.

1 2 3 4 5 6 7

34. I have a regular place set aside for studying.

1 2 3 4 5 6 7

35. I try to play around with ideas of my own related to what I am learning in this course.

1 2 3 4 5 6 7

36. When I study for this course, I write brief summaries of the main ideas from the readings and my class notes.

1 2 3 4 5 6 7

37. When I can't understand the material in this course, I ask another student in this class for help.

1 2 3 4 5 6 7

38. I try to understand the material in this class by making connections between the readings and the concepts from the lectures.

1 2 3 4 5 6 7

39. I make sure that I keep up with the weekly readings and assignments for this course.

1 2 3 4 5 6 7

40. Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives.

1 2 3 4 5 6 7

41. I make lists of important items for this course and memorize the lists.

1 2 3 4 5 6 7

42. I attend this class regularly.

1 2 3 4 5 6 7

43. Even when course materials are dull and uninteresting, I manage to keep working until I finish.

1 2 3 4 5 6 7

44. I try to identify students in this class whom I can ask for help if necessary.

1 2 3 4 5 6 7

45. When studying for this course I try to determine which concepts I don't understand well.

1 2 3 4 5 6 7

46. I often find that I don't spend very much time on this course because of other activities.

1 2 3 4 5 6 7

47. When I study for this class, I set goals for myself in order to direct my activities in each study period.

1 2 3 4 5 6 7

48. If I get confused taking notes in class, I make sure I sort it out afterwards.

1 2 3 4 5 6 7

49. I rarely find time to review my notes or readings before an exam.

1 2 3 4 5 6 7

50. I try to apply ideas from course readings in other class activities such as lecture and discussion.

1 2 3 4 5 6 7

APPENDIX C

Participation in this questionnaire is voluntary, refusal to participate will involve no penalty, and participants may discontinue participation at any time without loss of benefits to which they would otherwise be entitled. In completing this questionnaire, please understand that you are acknowledging your consent to participate in the study. For purposes of publication, all information will be coded to protect confidentiality.

Participation Number: _____

Beliefs about Peer-Feedback Questionnaire (BPFQ)

Instructions: Read each statement below and either rate how much you agree or disagree with the statement or rate how much the statement applies to you or not.

1. Involving students in feedback through the use of peer-feedback is meaningful.
   1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree
2. Peer-feedback within this course is useful.**1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree**
3. Feedback should only be provided by the teaching staff.
   1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree
4. Involving students in feedback through the use of peer-feedback is instructive.
   1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree
5. In general, I am confident that the peer-feedback I provide to other students is of good quality.
   1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree
6. In general, I am confident that the peer-feedback I provide to other students helps them to improve their work
   1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree
7. In general, I am confident that the peer-feedback I receive from other students is of good quality
   1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree
8. In general, I am confident that the peer-feedback I receive from other students helps me to improve my work.
   1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree

9. Being capable of giving constructive peer-feedback is an important skill
   1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree

10. Being capable of dealing with critical peer-feedback is an important skill.
    1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree

11. Being capable of improving one's work based on received peer-feedback is an important skill
    1 Completely Disagree 2 Somewhat Disagree 3 Neutral 4 Somewhat Agree 5 Completely Agree

APPENDIX D: GUIDED SELF-REFLECTION

This self-reflection protocol was created using a modified Gibb's model and is a reflection on action meaning looking back at an experience to see what may be learned and what may change next time. (reflecting in action/practice is when you reflect during a situation and you have to make a decision as to what to do next; making a decision in the moment)

1. Describe some times when you were collaborating with your team. You do not need to make any judgments or come to any conclusions simply describe the scenario(s) in a factual manner.

2. What were your thoughts and feelings during this time of collaboration with your team? Do not analyze your feelings just make note. Consider how you felt before, during, and after the event. How do you perceive the feelings of your teammates?

3. What was good and bad about the collaboration. List first the good parts of the experience then the bad. Be objective in your evaluation. How did you and the others contribute to it (positively or negatively).

4. Consider the experience from your teammates perspective and reflect on the feedback provided by your teammates by answering the following:

5. Agree with the feedback?
    - What parts did you agree with?
    - What parts did you disagree with?
    - What surprised you?
    - Was there some feedback that brought to your attention a behavior you were unaware of?
    - Do you believe the feedback was helpful?
    - Was the feedback candid and constructive?
    - Would you reword any of the feedback to increase its effectiveness in assisting you in becoming a better team member?
    - Will this feedback make you a better team member and result in better learning outcomes for your team?
    - Do you plan to change any behaviors based on this feedback? If so, what are your exact plans/goals?

Gibbs, G. (2013). *Learning by doing.* (Original work published in 1988). Retrieved from https://thoughtsmostlyaboutlearning.files.wordpress.com/2015/12/learning-by-doing-graham-gibbs.pdf