

**THE EFFECTS OF CLASS WIDE PEER TUTORING ON STUDENTS' ACQUISITION  
OF CERTIFIED NURSING ASSISTANT VOCABULARY IN A RESIDENTIAL  
SETTINGS**

**By**

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**CERTIFICATION OF PROJECT WORK**

We, the undersigned, certify that this project entitled, *The Effects of Class Wide Peer Tutoring on Students' Acquisition of Certified Nursing Assistant Vocabulary in a Residential Setting* by *Jillian Pettis*, Candidate for the Degree of Master of Science in Education, Department of Curriculum & Instruction, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.

  
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## **Abstract**

A CWPT study was conducted in a job training programs certified nursing assistant classroom. Students involved in the study ranged in age from 18-24. Vocabulary words were chosen to assist the students with their daily quizzes. Sixteen students participated in the study. Students were randomly paired with other students and placed on either the red or blue team each week the study was in place. Students participated in tutoring for a total of 20 minutes a day. Students acted as both tutors and tutees, switching roles after ten minutes. Points were earned for correct answers and were added with their team's scores after each day's session. Results showed that CWPT raised the daily averages of test scores and their ability to work with their peers.

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**THE EFFECTS OF CLASS WIDE PEER TUTORING ON STUDENTS' ACQUISITION  
OF CERTIFIED NURSING ASSISTANT VOCABULARY IN A RESIDENTIAL  
SETTING**

For the past 30 years, Class Wide Peer Tutoring (CWPT) has been used to improve the academic and interpersonal performance of students with and without disabilities across this nation. CWPT was developed by researchers at the Juniper Gardens Children's Project in Kansas City, Kansas in the early 1980s (Buzhardt, Greenwood, Abbott, & Tapia, 2007; Delquadri, Greenwood, Stretton, & Hall, 1983), and it is currently available under the commercial title of *Together We Can* (Greenwood, Delquadri, & Carta, 1997). CWPT was designed initially to improve basic academic skills (i.e., reading, math, and spelling) of low performing elementary students (Delquadri et al., 1983). However, its use was extended subsequently by researchers to secondary settings in social studies (Maheady, Sacca, & Harper, 1988), science (Bowman-Perrott, 2009), mathematics (Kamps, Greenwood, et al., 2008), and modern languages (Madrid, Canas, & Ortega-Medina, 2007; Wright, Cavanaugh, Sainato, & Heward, 1995). Greenwood, Arreaga-Mayer, Utley, Gavin, and Terry (2001) reported that at least 25 high quality, peer-reviewed studies found CWPT to be superior to conventional forms of teacher-led instruction. Perhaps the most compelling support, however, came from a 12-year experimental longitudinal study (Greenwood, Delquadri, & Hall, 1989; Greenwood & Delquadri, 1995). Here researchers compared groups of students at-risk and not at-risk who had or had not received CWPT instruction. They found that CWPT (a) increased students' active engagement during instruction in grades 1 to 3; (b) improved pupil achievement at grades 2, 3, 4, and 6; (c) reduced the number of CWPT students in need of special education services by 7th grade; and (d) decreased the number of students who dropped out of school by the end of 11th grade. Sideridis and his

colleagues (1997) also reported that CWPT improved interpersonal interactions and relationships among pupils with and without special needs in an integrated educational setting. Finally, CWPT was given the “*Go with It*” designation as an evidence-based practice by the Council for Exceptional Children’s Division of Research (Maheady, Harper, & Mallette, 2003).

Given CWPT’s consistent positive effects on pupils’ academic and interpersonal performance, it provides an appealing instructional alternative for classroom teachers; particularly those working with students with chronic academic, motivational, and/or interpersonal challenges. The purpose of this investigation, therefore, was to examine the effects of CWPT on the academic performance of a class of secondary students enrolled in a residential vocational training program. It was hypothesized that CWPT would increase students’ acquisition and retention of important Certified Nursing Assistant (CNA) vocabulary and improve their interpersonal relationships while working together in class. If positive effects are found, then this study will extend CWPT’s effectiveness to a new student population and setting, as well as another academic outcome (i.e., vocabulary acquisition). The next section provides an illustrative review of CWPT studies over the past three decades highlighting effects across diverse learners, geographic locations, and different educational researchers.

### ***Three Decades of CWPT Research***

Delquadri et al. (1983) conducted the first controlled study on the spelling tutoring game. Using an A-B-A-B design they compared the effects of teacher-led instruction to the tutoring game on the spelling test scores of 18 normally developing students and six peers with learning disabilities. The tutoring game was played for 15 minutes per day and students took turns being tutors and tutees. They also posted their points on a scoreboard and earned recognition rewards for being on the “team of the week”. Delquadri et al reported that the spelling tutoring game

immediately decreased pupils' spelling errors from a mean of 9 during baseline to 2.5 when the tutoring game was in effect. Importantly, the study also found that the intervention was equally effective for students without disabilities; that is both students with and without disabilities benefitted from the use of the peer tutoring game.

Greenwood, Dinwiddie and their colleagues (1984) then conducted a large scale investigation that examined the effects of teacher- versus peer-mediation on academic outcomes in spelling, math and vocabulary. The study took place in a Title I elementary school in inner-city Kansas City. Five teachers and 128 students participated and three separate experiments were conducted. Greenwood et al concluded that, "results showed that the class-wide peer tutoring program produced consistently superior weekly achievement compared to existing instructional procedures" (p. 536).

Juniper Gardens' researchers (Greenwood, Dinwiddie, Bailey, Carta, Dorsey, Kohler, Nelson, Rotholtz, & Schulte, 1987) conducted a longitudinal experimental study to replicate the effects of Class Wide Peer Tutoring. The study was conducted in four inner-city schools that served a low socioeconomic, predominantly African-American population in the northeast section of Kansas City, Kansas. Two hundred and eleven students participated and initially they attended 1<sup>st</sup> and 2<sup>nd</sup> grade classrooms. Researchers found that there were clear achievement increases among high- and low-performing students across settings and years. Greenwood et al. (1987) noted that, "results indicated that substantial improvements were made by students over pretest levels under teacher instructional procedures, but that significant additional improvements were made during class-wide peer tutoring" (p.158).

In another CWPT spelling study, Maheady and Harper (1987) examined the intervention's effects on four classes of ethnically and linguistically diverse students in a small

urban setting in Western New York. The dependent variable was the percentage of words spelled correctly on 18-word, weekly spelling tests and CWPT was used for only 10 minutes per day yet it still produced immediate increases in the percentage of words spelled correctly. In fact, weekly spelling test averages were above or approaching 90% across all four classrooms by study completion. A retention test after summer break found that students correctly spelled 81% of previously acquired words.

In one of the first secondary applications, Maheady et al (1988) examined the impact of CWPT on 10<sup>th</sup> grade students' social studies quiz scores. The study was conducted in an urban school district in the Northeast and focused on student ability to listen attentively, take good notes, and follow textbook instructions. CWPT was used twice per week with 50 students during regularly scheduled social studies classes. Results showed that CWPT produced immediate and noticeable increases in students' weekly test grades. These gains ranged from 19 to 27 percentage points above teacher-led instruction over the course of the investigation or the equivalent of two to three letter grade improvements. Intervention effects were replicated across subsequent experimental phases. The researchers concluded that CWPT was, indeed, an effective intervention for improving the social studies test performance of urban youth. They also encouraged more research to isolate active components in the CWPT program.

Greenwood et al (1989) conducted a longitudinal study on the effects of CWPT. The study included two low-SES groups and a high-SES comparison group. A total of 416 students in first and second grade classrooms were involved. CWPT was first introduced during the 30-minute spelling period and it was then phased into math and vocabulary instruction. Researchers found that the experimental group consistently outperformed the control group across all academic domains. The researchers reported further that, "even though CWPT was only

partially implemented, it produced important changes in (a) classroom ecological processes; (b) students behavior processes; and (c) students' gains in academic achievement" (p. 382).

Bell, Young, Blair, and Nelson (1990) conducted another CWPT study in three social studies classes containing 59 normally developing students and seven peers with learning and behavior disorders. Students spent three, 20-minute sessions tutoring one another each week switching roles after pre-established time limits. Results showed that, "CWPT was associated with several immediate and substantial changes in the individual test scores of the students with behavioral disorders" (p. 6). Students' social studies grades improved by one to three grade levels when CWPT was in effect.

Harper, Mallette, Maheady, Parkes, and Moore (1993) completed another study to examine the effects of CWPT on students' acquisition, retention, and generalization of sight vocabulary words among eight students in a self-contained special education classroom. Students first learned spelling words using a shortened version of CWPT and then were assessed on the content 18 days later. Results showed that generalization, retention, spelling accuracy and sight vocabulary all increased with CWPT. According to the researchers, "this investigation provided considerable evidence that CWPT was an effective intervention to improve the spelling performance of children with mild handicapping conditions (p. 35)".

In another study, DuPaul and Henningson (1993) used CWPT with a student who was diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). Don had difficulty staying on-task and fidgeted quite often. A tutoring program was adapted for him. His tutor was given 30 math problems and dictated them orally to Don. He was instructed to complete as many problems as he can in 10 minutes. They then switched roles for the remaining 10 minutes. During baseline instruction, Don was only on-task 39% of the time. When CWPT was put into

effect, his on task rate increased immediately to 89%. DuPaul and Henningson concluded that, “A dramatic increase in on-task behavior and reduction in motor restlessness were observed during the first peer tutoring condition. Don’s attention to instruction was more consistent than during the first baseline (p. 6)”.

Kamps, Barbetta, Leonard, and Dequadri (1994) conducted an interesting study designed to improve reading skills and promote positive social interactions among students with autism and their general education peers. During CWPT, learners read orally for eight to 10 minutes from the same reading materials used in baseline instruction, while tutors assigned points for correctly read sentences. Target students were three males on the autism spectrum disorders and their general education peers in an elementary school classroom. Results showed that CWPT increased all three boys reading rates. According to Kamps et al., “these findings indicated that class-wide peer tutoring was an effective and efficient strategy for increasing the academic achievement and social interactions of students with autism and their nondisabled peers (p. 56)”.

Wright et al (1995) also extended the use of CWPT to a secondary, Spanish class in a suburban public high school. This particular class was labeled as “modified Spanish” and contained 16 students, six of whom had learning disabilities and 10 who were at-risk of failing their foreign language requirement. CWPT was used to improve student understanding of vocabulary terms, verb conjunctions, correct spelling, punctuation, and the appropriate use of articles and diacritical marks. Tutee’s and tutors quizzed each other on eight Spanish vocabulary words each day for 20 minutes. Results showed that CWPT increased students’ vocabulary rates by 7.0 to 7.9 new vocabulary words every two days. Wright et al. concluded that, “Peer tutoring also offers a means of helping language students engage in high levels of responding (p. 10)”.

Block, Oberweiser, and Bain (1995) provided an interesting application of CWPT to facilitate inclusion of students with disabilities into a physical education class. The study included a young girl with severe motor delays and used CWPT to improve her rope jumping skills. Students were told that one partner would practice the skill for 10-15 minutes while the other partner focused on specific components. Students would then switch roles. For example, “a student who was working on ‘jumps on toes softly’ would jump five times in a row while his partner watched, gave pointers and recorded on a records sheet” (p. 5). Results showed that CWPT improved the target student’s rope jumping skills and facilitated her inclusion into the class. Students learned skills faster with CWPT than teacher-led instruction and they were more receptive to working with partners.

In one of the first studies examining the social effects of CWPT, Sideridis et al (1997) conducted a study involving three students with mild disabilities and three normally developing peers in a 6<sup>th</sup> grade classroom. CWPT was used four times a week for 30 minutes per day in spelling. Results showed that CWPT produced more accurate spelling test performance than teacher-led instruction method. Importantly, the researchers also noted that, “the study also suggested that CWPT was an effective instructional strategy for increasing the within classroom social interactions (p. 457)”. This provided an objective data set to accompany earlier anecdotal reports of improved interpersonal interactions when CWPT is in effect.

In a later analysis, Arreaga-Mayer (1998) discussed the effects and potential utility of CWPT for secondary students with mild disabilities, English Language Learners (ELLs) and urban youth. She concluded that, “there is enough empirical evidence to support CWPT as an effective procedure that enables the classroom teacher to implement instructional processes

known to accelerate and maintain the academic learning of students with and without disabilities (p. 5)".

More recently, Kamps, Greenwood, and colleagues (2008) examined the effectiveness of CWPT in middle school settings. CWPT was used to improve literacy and overall academic performance across three urban and one suburban middle school. Twenty-five teachers and 975 students in 52 classrooms participated in the study. Fifty-four percent of the students were male and 46 % were female. The researchers reported improved academic performance in all content areas except science while CWPT was in effect. The study also suggested improving the effectiveness of CWPT with the addition of a lottery system.

Finally, Madrid and his colleagues (2007) explored the effects of different forms of CWPT on student performance in spelling. They included three instructional conditions (a) competitive peer tutoring; (b) cooperative peer tutoring; and (c) teacher-led instruction. Using an alternating treatments design, they examined the effects of each condition on 16 (10F, 6M) third graders' spelling scores. The researchers reported that, "Both tutoring conditions exceeded the teacher-led conditions (p.158)". Moreover, the cooperative peer tutoring procedure produced the greatest spelling gains.

Collectively, this illustrative literature review suggests that CWPT is an effective, classroom-based intervention that can be used to improve basic academic skills and facilitate the acquisition and retention of content-related information in a variety of subject areas. There is also a bit of evidence to suggest that CWPT might also promote more positive interpersonal interactions among those who participate in the tutoring game. The present investigation was undertaken to see if CWPT can also be used to improve the acquisition of certified nursing assistant vocabulary among a group of low-SES students in a residential vocational training

program. More specifically, this study addressed the following questions (a) what effects, if any, will CWPT have on students' daily vocabulary quiz scores compared to traditional, teacher-led instruction? and (b) How will students rate CWPT in terms of the importance of its goals, acceptability of its procedures, and satisfaction with its outcomes?

## **Method**

### ***Participants and Settings***

The present study was conducted in a Certified Nursing Assistant (CNA) classroom in a small, residential job training program in Western New York. Sixteen students (6M, 10 F) ranging in age from 18-25 years old participated in the study. Nine students were African American (8F, 1M) and three had IEPs' that targeted vocational training outcomes. There were also four Hispanic students (3M, 1F) without IEPs or 504 plans and three Caucasian pupils (1F 2M), two of whom had IEPs. Five students were classified as learning disabled and struggled with reading comprehension, fundamental math skills, and vocabulary acquisition. Students with IEPs only received accommodations on their (*Test of Adult Basic Education*) (TABE) assessments (2012 CTB/McGraw-Hill LLC). Two individual students, Mary and Jose, were also selected for individual data analyses. Mary had earned the highest baseline quiz scores and was functioning well in the certified nursing program, while Jose, an IEP student, earned the lowest baseline quiz scores. Their data patterns were examined in more depth to see the effects of CWPT at the extremes of the achievement range within this particular classroom.

The residential job training program has 270 students who participate in vocational training programs such as Certified Nursing Assistant, Plumbing, Carpentry, Painting, and Electrical. The training facilities and student population are quite diverse. Forty-five percent of students are African-American, 35% Hispanic, and approximately 20% are Caucasian. All

residential students come from low socio-economic status homes. The general education teacher was a Caucasian female with two years of teaching experience overall and in this facility. In addition to regularly scheduled instructional activities, she also developed CWPT materials (e.g., quizzes, scoreboards, and recognition awards), trained students to use it, and collected and analyzed all study-related data. A second adult, a Caucasian female, also assisted in the study by conducting inter-rater reliability and fidelity assessments.

The students were selected for participation because they were having difficulty acquiring and retaining complex medical terminology required for this particular course. They also had problems working collaboratively and treating one another with respect; two critical skills for certified nurse assistants. Given that CWPT requires students to work as a team to improve their overall academic performance, it was useful in meeting both academic and interpersonal needs.

### ***Dependent Variables***

There were two primary dependent variables (a) percentage correct on daily academic quizzes; and (b) pupils' social acceptability ratings of CWPT goals, procedures, and outcomes. The first dependent measure was taken from teacher-generated, 10-item, multiple choice quizzes that were administered at the end of each lesson. Quizzes were constructed by selecting important vocabulary and concepts from the certified nursing curriculum. The first quiz, for example, contained 10 multiple-choice questions with topics associated with basic nursing terminology or practice (e.g. emesis, edema, and supine). Other instructional topics included (a) role of the nurse aid; (b) personal care; (c) psycho-social care; (d) restorative care; and (e) residents' rights. Quiz content was taken directly from existing curriculum materials. The initial project goal was to increase students' mean test scores to at least 80%. Student quiz scores were

aggregated at the classroom level and displayed graphically across experimental phases to permit a visual analysis of CWPT effects on students' vocabulary quiz scores.

To ensure that quiz data were being collected accurately and reliably, inter-rater reliability checks were conducted during 25% of the study session. The special education teacher *independently* scored target students' quiz scores. The two raters' scorings were then compared on an item-by-item basis. If both raters scored an item in the *same way* (i.e., either correct or incorrect), then it was scored as an agreement (A). If the two independent raters scored an item *differently* (i.e., one scored it correct, the other incorrect), then it was scored as a disagreement (D). Inter-rater reliability was then calculated as the number of agreements divided by the number of agreements and disagreements times 100%. Inter-rater reliability averaged 94% with a range of 86% to 100% over the course of the investigation.

The second dependent variable was student ratings' on a 20-item, Likert-style, CWPT consumer satisfaction survey that were completed *anonymously* and *independently* right after the study was completed (see Appendix A). The survey asked students to rate, using a 5-item Likert-type scale, the (a) importance of intervention goals (e.g., how important is it to do well on CNA vocabulary quizzes and get along with classmates?); (b) acceptability of CWPT procedures (e.g., how much did you like being on a team, earning points, doing corrections, and earning team of the week certificates?); and (c) satisfaction with CWPT outcomes (e.g., how much did CWPT help you learn CNA vocabulary and get along better with peers?). Individual student ratings were aggregated by item and were displayed in tabular fashion.

### ***Independent Variable***

The independent variable was the Juniper Gardens' Class Wide Peer Tutoring (CWPT) program (Delquadri, Greenwood, Whorton, Carta, & Hall, 1986; Greenwood et al., 1997).

CWPT is an intra-class, reciprocal tutoring program that has been researched extensively over the past 30 years (Buzhardt et al., 2007; Greenwood, Maheady, & Delquadri, 2002). There are four major components to CWPT (a) weekly competing teams; (b) highly structured tutoring procedures; (c) daily point earning, public posting, and contingent rewards; and (d) direct practice of functional academic skills (i.e., understanding important CNA vocabulary terms). Weekly competing teams are formed by having pupils select differing colored paper slips (red versus blue) from a covered box. Tutoring pairs were then formed *within* each team. The second component was a highly structured, reciprocal peer tutoring procedure. Tutoring pairs took turns serving as “tutors” and “tutees” for 10 minutes each. Tutors dictated vocabulary from a series of content cards and tutees were required to *write and say* their answers (i.e., define words and state related facts). If answers were correct, tutors awarded five (5) points and dictated the next vocabulary terms. If tutees’ answers were incorrect, then tutors (a) provided the correct answers; (b) asked tutees to write the correct response three times; and (c) awarded one (1) point if errors were corrected. Half-way through tutoring sessions, partners switched roles and followed the same procedures for an equivalent amount of time. While pupils worked in tutoring pairs, the investigator moved through the classroom awarding bonus points for students who were following tutoring procedures well and/or providing encouragement and support for partners and teammates. Immediately after tutoring, pupils totaled their points, including bonus points, and wrote the totals on top of their papers. Individual and team point totals were then displayed prominently in class using the CWPT scoreboard. Finally, team point totals were cumulative throughout the week. At the end of the week, the team with the most points was designated “team of the week” and they signed their names to recognition certificates that were displayed

prominently in class. Each week, new teams and tutoring pairs were formed using previously described procedures.

To ensure that CWPT was being implemented as intended a 16-item procedural checklist was developed (see Appendix B). The fidelity checklist consisted of all steps necessary to use CWPT as outlined by its developers and spaces to note the “presence” and “absence” of each step. During 25% of the intervention sessions, another teacher observed the investigator and recorded which procedural components were present and absent. Fidelity of implementation was calculated as the number of steps present divided by the number present and absent times 100%. CWPT was implemented with 96% accuracy over the course of the investigation (range = 94% to 98%).

### ***Experimental Design and Procedures***

An A-B-A single case research design was used to examine the effects of CWPT on students’ vocabulary quiz scores. This particular design is capable of establishing a cause-and-effect relationship by showing that pupil performance changes, when and only when, the intervention is introduced and withdrawn (Kennedy, 2005). Initially, the intent was to end the investigation on an intervention phase however, changes in scheduling patterns at the residential facility prohibited additional data collection. The study began with an initial baseline phase. Here, “typical” or existing instructional practices were used and student performance was assessed using 10-item, vocabulary quizzes. Quiz scores were collected for a minimum of five consecutive data points to determine stability. These baseline data were then used to (a) identify students’ current knowledge levels; (b) select appropriate target students; and (c) compare against intervention outcomes. Following initial baseline, the investigator taught students to use CWPT during a 40-minute, training session. Intervention procedures were described and then the

class role-played a CWPT session while the investigator provided positive and corrective feedback. After pupils demonstrate an ability to use CWPT procedures accurately (i.e., 85% fidelity and higher), formal data collection began.

CWPT was used five days per week for approximately 20-minutes per day and replaced independent seatwork time in the baseline routine. A typical CWPT session proceeded as follows. On the first day of the week, students were randomly assigned to two competing teams by picking different colored pieces of paper (red and blue) from a covered box. The selected color designated one's team for the week and pupils were paired up within the same team. For the next 20 minutes, tutor pairs participated in reciprocal tutoring sessions for equal amounts of time (i.e., 10 minutes each). For example, Student A began the first 10-minute segment as the tutor and Student B was the tutee. After 10 minutes, they reversed roles (i.e., Student B was tutor and Student A the tutee). Tutors presented a series of CNA vocabulary content cards and asked tutees to define (orally and in writing) each term. If they were correct. Then tutors said "that's right" and awarded five (5) points. If tutees were incorrect, then tutors provided the correct definition and tutees wrote it correctly three times to earn two (2) points. If tutees didn't correct errors or refused to do them, then no points were awarded and the next item was presented. The object was for students to earn as many points as possible for themselves and their team and for team members to encourage and support one another for doing so. Bonus points were given by the investigator writing the number of points on the top of student worksheets when they were following tutoring procedures (e.g., correcting errors, awarding assign the right number of points, and calculating daily totals) and/or offering support and encouragement. The investigator balanced bonus point distribution by assigning up to 25 bonus points per session to each team. At the end of the 20-minute session, students totaled their points from the session. To increase the

likelihood of correct point totaling, the investigator randomly selected one paper from both teams and scored it publicly. If points were within five of the actual total, then teams earned 100 bonus points. If totals were not within five points, then the total was adjusted and no bonus points were awarded to that team.

Daily individual and team point totals were calculated and monitored to assess pupil progress. A scoreboard was posted in the front of the classroom to track pupil progress. At the end of each CWPT session, students took 10-item chapter tests. They were told that they would earn 10 points for themselves and their teams for each question answered correctly on these assessments. Daily points were then added cumulatively to determine the “winning team of the week”. The winning team applauded their opponent’s efforts and signed their names to a Team of the Week certificate that was displayed prominently in the classroom. Teams were reconstituted every week so all students had equal opportunities to win and work with all class members. After intervention data stabilized, CWPT was removed for a brief return to baseline (i.e., one week.). Immediately after the last tutoring sessions, pupils completed CWPT consumer satisfaction surveys independently and anonymously.

## **Results**

As shown in Figure 1, the class’ overall performance on vocabulary quizzes was fairly stable during initial baseline sessions. The overall class average was 79% or the equivalent of a C+ grade with a range of 73% to 87%. When CWPT was implemented the class average rose immediately and noticeably to a mean of 91% with a range of 87% to 92%. This was approximately a one and a half letter grade increase in the class average. There was only one overlapping data point across the first two experimental phases. After intervention data stabilized, CWPT was removed and baseline conditions were reinstated. As depicted, the class

average dropped once again to a mean of 81% with a range of 75% to 85%. Once more this represented about a letter grade decrease in the class' overall vocabulary mean. The data showed a decelerating trend and there were no overlapping data points between adjacent phases.

As noted earlier, data were also collected on two individual students, Mary and Jose, who were the highest and lowest performers respectively during initial baseline assessments. Data relevant to Jose's performance, the lowest achiever, are depicted in Figure 2. As shown, Jose's overall average was a C (78%) and his baseline quiz scores ranged from 69% to 84%. For the most part, his baseline performance was quite stable. When CWPT was implemented, Jose's quiz scores increased immediately to a mean of 90% (range: = 87% to 92%) and there was a slight accelerating trend in his data patterns. There were no overlapping data points across the first two experimental conditions. When CWPT was removed, Jose's quiz average dropped once again to a mean of 81% with a range of 79% to 85% and there was a slight decelerating trend in his quiz scores. Once more there were no overlapping data points across the first intervention and second baseline phase.

Data related to Mary's performance, the highest achiever, can be seen in Figure 3. As depicted, Mary was doing quite well during initial baseline assessments. Her overall average on weekly vocabulary quizzes was 89% (B+) with a range of 83% to 95%. When CWPT was introduced into the class, Mary's quiz scores rose immediately to an average of 93% (A) with a range of 91% to 96%. There was only one overlapping data point between initial baseline and intervention conditions. When CWPT was removed, Mary's average dropped slightly to 90% with a range of 89% to 90% and there were no overlapping data points across adjacent phases.

Student ratings on the consumer satisfaction survey were aggregated and can be seen in Table 1. As shown, students rated most intervention goals quite favorably. The results of the

survey concluded that there was general satisfaction with the study. They believed that it helped them learn their vocabulary and develop better relationships with their peers.

### **Discussion**

The present findings suggest that Class Wide Peer Tutoring was an effective intervention for improving the certified nursing vocabulary scores of a group of adolescents enrolled in a residential vocational training program. The class average increased by over one letter grade and all students appeared to have higher averages while CWPT was in effect. These results are consistent with a number of empirical studies showing the academic benefits associated with the use of this peer teaching intervention (e.g., Buzhardt, et al., 2007; Greenwood, et al., 1989; Greenwood, et al., 1987; Maheady, Harper, Mallette, & Winstanley, 1991). More impressively, current findings showed that CWPT had similarly beneficial effects on target students representative of the entire range of achievement in the target classroom. The highest and lowest performing students, for example, showed similar gains in their understanding of certified nursing vocabulary while CWPT was in effect. The fact that CWPT improved performance of pupils at differing achievement levels should add to its potential usefulness for practitioners. Classroom teachers can be assured, for example, that all pupils, not just low performers, are benefitting from CWPT. It is unclear, however, whether student performance increases were due to between-team competition, structured tutoring procedures, point earning, public posting, daily timings, and/ or a combination of these things. Future research may consider a component analysis to identify the most active intervention ingredients.

It is also important to point out that while CWPT did not reduce the overall achievement *gap* between students, it did show that pupils at varied performance levels were equally responsive to the intervention. The present study also extended the efficacy of CWPT to another

student population and a new outcome measure (i.e., certified nursing vocabulary). The fact that such improvements were made on a facility-adopted, curriculum-based assessment measure was significant as well. Given the increased attention to linking student learning to teacher performance, CWPT may become more attractive to classroom teachers who must provide “evidence” to support their impact on pupil learning.

It was also interesting that target students almost always performed better under CWPT than baseline instruction. It is rare, indeed, when a classroom-based intervention can produce such consistent improvements in pupil performance over time. During the intervention phases, the entire class and target students improved their weekly quiz scores by one to one and a half letter grades. This would be considered substantial growth in the achievement growth literature. Any time classroom teachers can get substantial and comparable growth rates among their high, and low performing pupils, they are sure to be satisfied

In addition to academic improvements, students really seemed to like CWPT. As noted in their satisfaction surveys, they thought that it was very important for them and their peers to do well in nursing vocabulary and to get along well with one another. They were also very positive in their evaluation of almost all CWPT components, with less preference shown only for the error correction procedure; a finding that was reported elsewhere (Kamps, Barbetta, Leonard, & Delquadri, 1994; Maheady, Harper, Mallette, & Karnes, 2004; Maheady, Harper, Mallette, & Winstanley, 1991). Similarly, pupils were satisfied with CWPT outcomes noting that it improved their vocabulary quiz scores and helped them to get along better with others. Any interventions that improve pupil performance and are well-liked should be retained in teachers’ instructional repertoires.

The present findings also showed an increase in positive classroom dynamics and motivation. For example, students were more excited to participate in this competition every time the teacher entered the classroom. This also produced quick and effective transitions from their previous work activities. Students, who were initially reluctant to hurry to class, were now motivated to come back immediately, sit in their desks, and wait patiently for CWPT to begin. This produced a noticeable decrease in inappropriate behavior which was an on-going problem with these students. In addition, the use of bonus points for positive behavior and good manners during the CWPT sessions led to an increase in positive peer interactions which extended beyond certified nursing class. Overall, students were nicer to one another and were eager to perform well in class. On Mondays, when students were assigned to weekly competing teams, they were thrilled to see which team and who their new partners were. Regardless of partners, students were motivated to do better to impress their teammates and the rest of the class. When the students found out that the study was coming to an end, they begged their classroom teacher to continue CWPT when the investigator was gone.

The present results have some important implications for teaching vocabulary skills. First, many teachers complain that incoming students have poor vocabulary skills and are reluctant to do use “drill activities” to practice and master these skills. As such, pupils were not used to or particularly excited to practice their vocabulary terms. This reluctance to use practice-related activities, however, never occurred during CWPT. Instead, CWPT provided an easy, effective, and fun way to practice vocabulary terms while using a game-like format. The teacher and school leader also saw the practical and educational significance of using CWPT to improve pupil performance on existing curriculum materials. Finally, the CWPT format, (i.e. between-team competition, reciprocal tutoring, point earning, and public posting) is very adaptable and

can be used in a variety of subject areas and grade levels. Students looked forward to coming to class because of their increased confidence and comfort with their progress and skills.

Although the intervention was very effective, there were a few important limitations to the current study. First, the study was conducted with only one group of students in one subject area and for a relatively short period of time. Due to requirements to complete the master's project, the investigator was unable to conduct more extensive experimental phases. It would have been more convincing for example, to show that the positive effects of CWPT lasted for longer than a couple of weeks. Similarly, no attempts were made to measure the generalization or maintenance effects of CWPT. Because of this, the investigator is unable to say if the improvements noted during nursing classes were shown in other subject areas.

In conclusion, the present study provides additional evidence that Class Wide Peer Tutoring is a powerful tool for improving students' academic and interpersonal performance. In this case, adolescent students enrolled in a residential vocational training program improved their weekly vocabulary scores on certified nursing content when CWPT was in effect. Moreover, noticeable and immediate gains were found for the entire class, as well as the highest and lowest performer. This study along with many others conducted by separate researchers in different locations and with pupils of varying grade and age levels suggests that Class Wide Peer Tutoring is a reliable and consistent intervention for improving pupils' basic skills performance. Given increases in inclusive educational placements and an increased emphasis on the use of scientifically-based teaching practice, CWPT may provide a powerful instructional alternative for classroom teachers. Although further research must be completed on the long-term impact of using CWPT on pupils' high stakes test performance, as well as on the generalization and

maintenance of intervention effects, current findings do suggest that Class Wide Peer Tutoring is a viable instructional practice for classroom teachers.

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Figure 1 shows the effects of Class Wide Peer Tutoring on the entire class' vocabulary quiz scores.

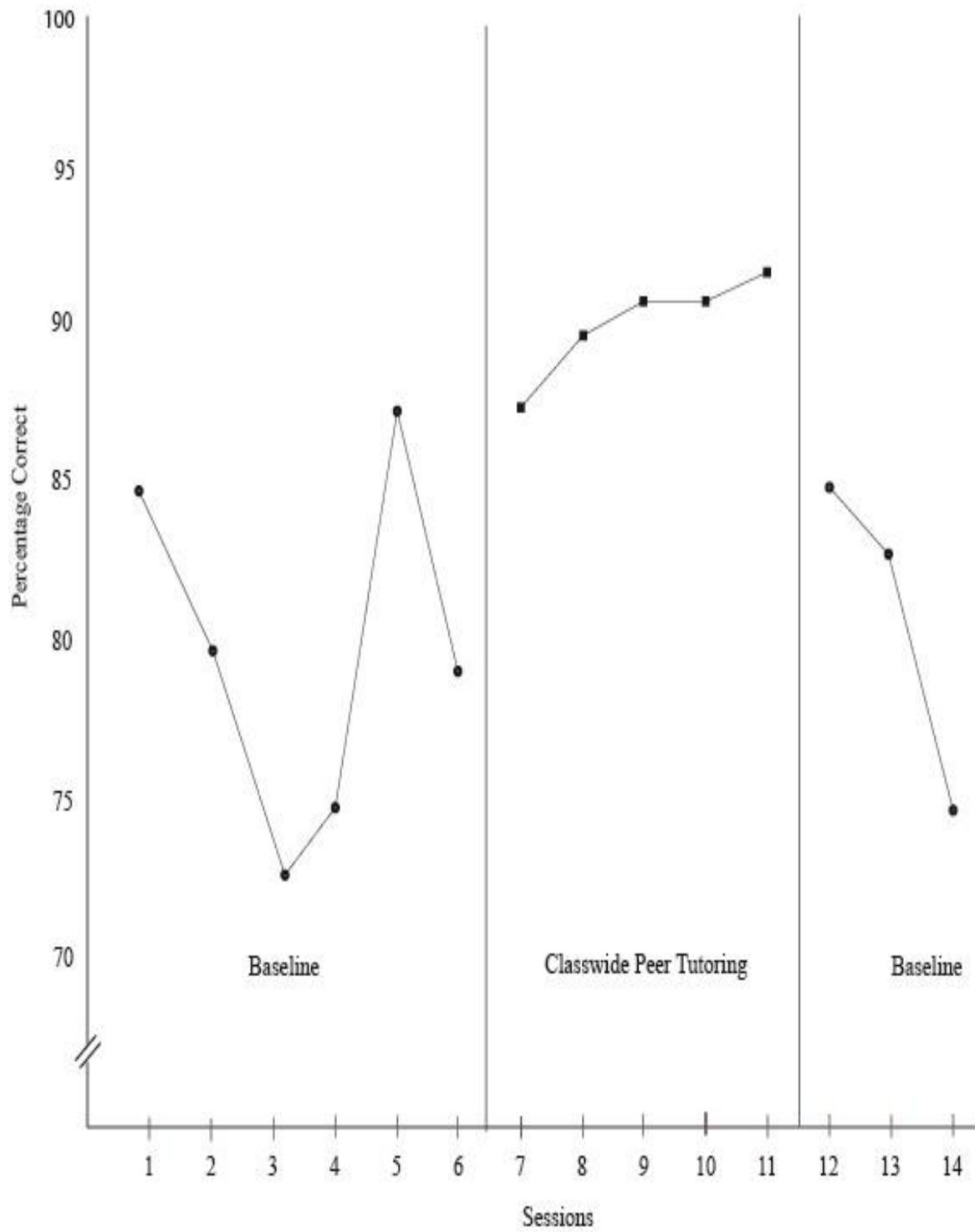


Figure 2 shows the effects of Class Wide Peer Tutoring on Jose's vocabulary quiz scores.

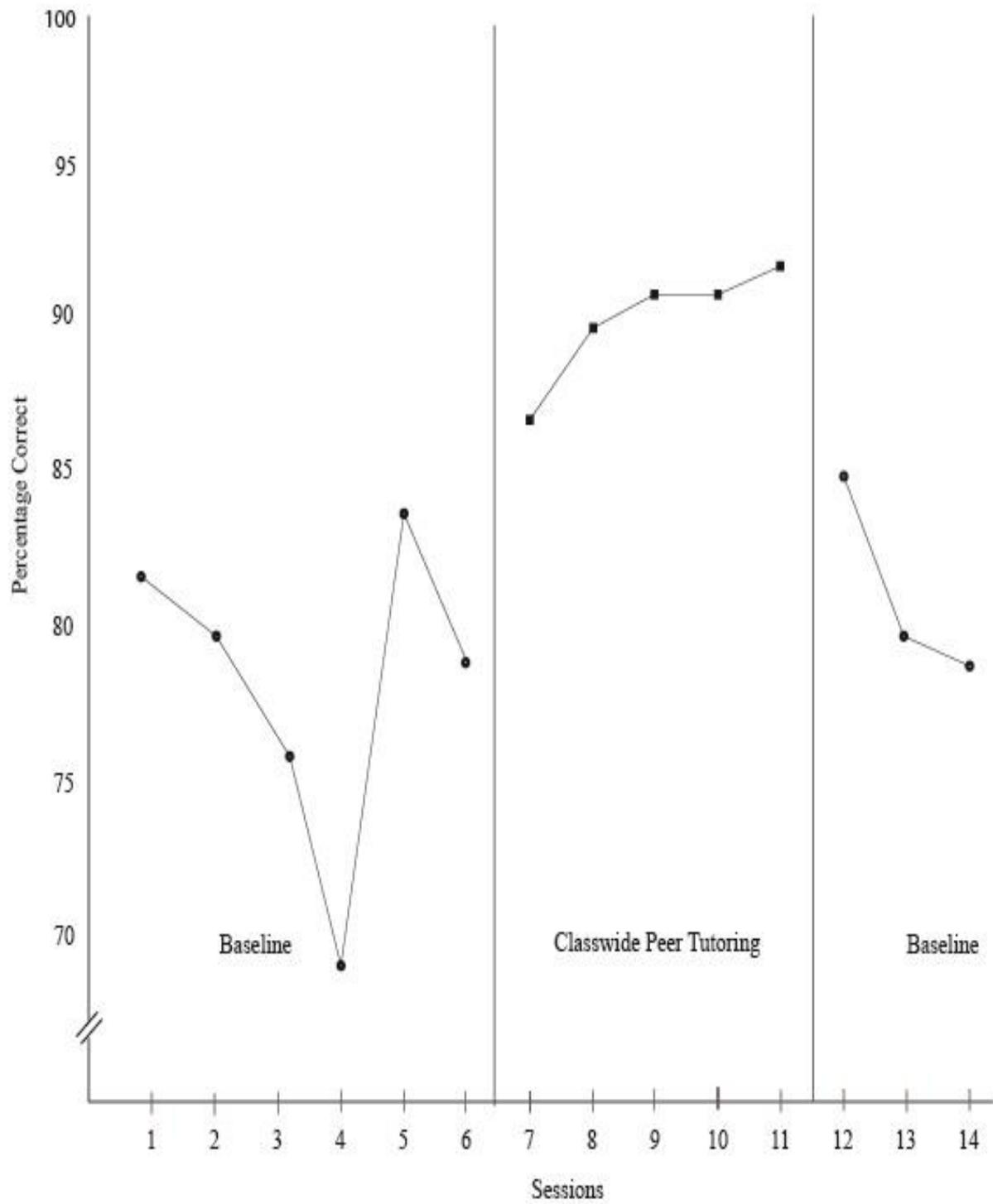
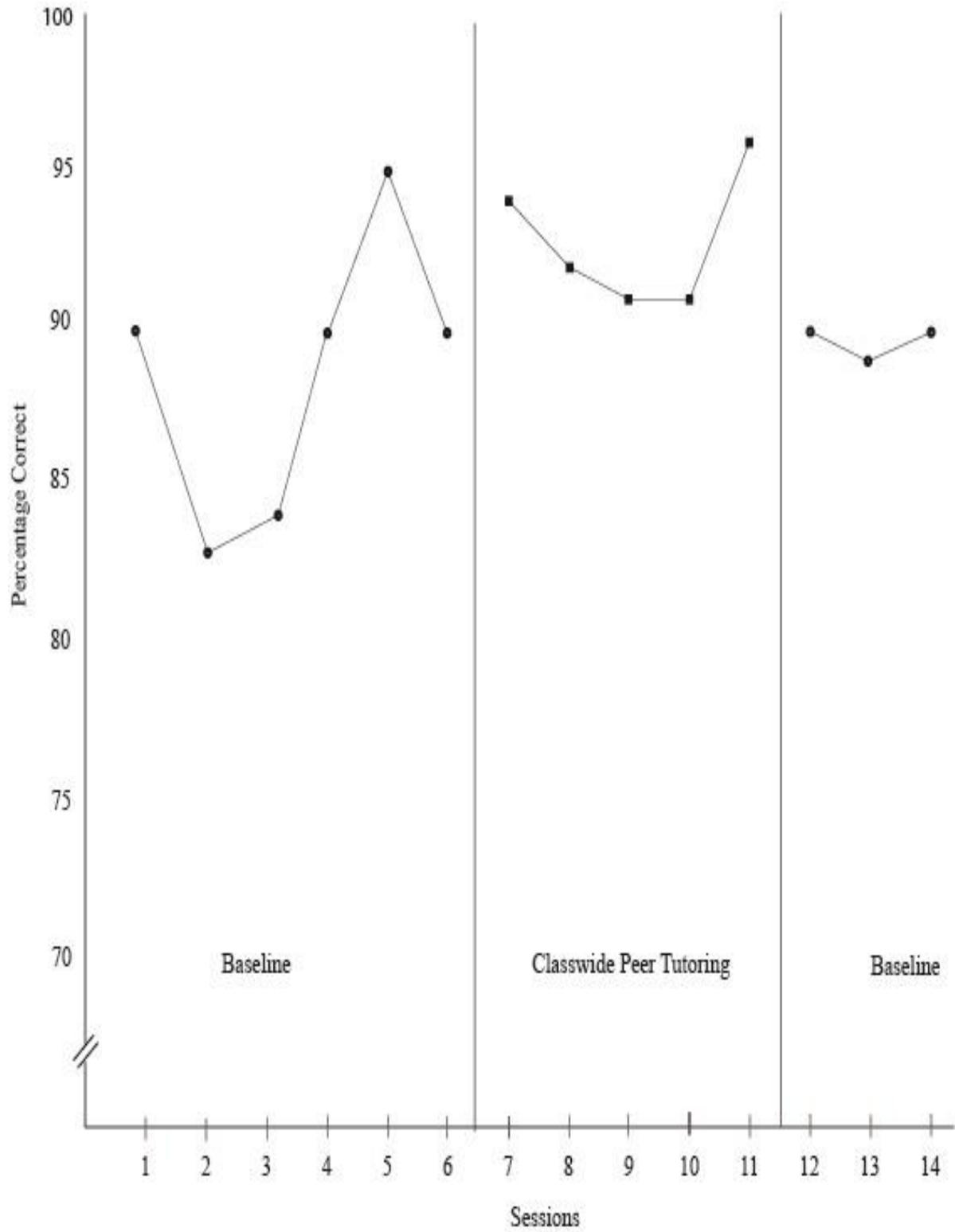


Figure 3 shows the effects of Class Wide Peer Tutoring on Mary's vocabulary quiz scores.



**Table 1. Mean consumer satisfaction ratings by CNA students in a job training program**

Items	Mean
1. <b>How important is it for you to do well on your CNA chapter quizzes?</b>	6
2. <b>How important is it for other students in your class to do well in CNA?</b>	4.5
3. <b>How important is it for students to get along well with one another in class?</b>	4.2
4. <b>How much did you like being on a CWPT team during CNA class?</b>	6
5. <b>How much did you like being a tutor (teacher) within your team?</b>	6.2
6. <b>How much did you like being a tutee (student) within your team?</b>	5.4
7. <b>How much did you like using the CNA vocabulary content cards with other team members?</b>	6
8. <b>How much did you like earning points during CWPT in CNA class?</b>	5
9. <b>How much did you like making corrections when practicing CNA vocabulary content cards?</b>	3.2
10. <b>How much did you enjoy earning bonus points during CWPT sessions?</b>	7
11. <b>How much did you like earning student store bucks?</b>	6.4
12. <b>How satisfied are you with your overall performance in CNA?</b>	5.6

13. <b>How satisfied are you with your performance on the CWPT teams?</b>	6
14. <b>How much did CWPT help you learn CNA vocabulary better?</b>	7
15. <b>How much did CWPT help you get along better with others in class?</b>	5
16. <b>Does CWPT seem like something that should be done in school?</b>	4
17. <b>Could CWPT be harmful to other students?</b>	1.5
18. <b>Did other students think that you are smarter after using CWPT?</b>	5.5
19. <b>Overall what did you think of CWPT?</b>	5.2
20. <b>Which would you rather do, work independently on your CNA vocabulary or use CWPT?</b>	6







19. Overall, what did you think of CWPT?

1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_ 7 \_\_\_\_\_

didn't like at all

liked somewhat

liked it a lot

20. Which would you rather do, work independently on your CNA vocabulary or use CWPT?

1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_ 7 \_\_\_\_\_

Work alone

doesn't matter

Use CWPT

**Additional Comments:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Appendix B

### Juniper Gardens' Class Wide Peer Tutoring

#### Procedural Fidelity Checklist

Teacher \_\_\_\_\_

Date \_\_\_\_\_

Observer \_\_\_\_\_

D.O. = Didn't Observe

	<u>Yes</u>	<u>No</u>	<u>D.O.</u>
1. Students are assigned to teams.	___	___	___
2. Students are assigned to partners	___	___	___
3. Students sit in close proximity to each other	___	___	___
4. Team Point Charts posted	___	___	___
5. All <b>Tutees</b> have worksheets and pencils	___	___	___
6. All <b>Tutors</b> have point recording sheets	___	___	___
7. Teacher previews content before session	___	___	___
8. Teacher sets timer for 10 minute session	___	___	___
9. Teacher circulates to reward bonus points	___	___	___
10. Teacher helps pairs when needed	___	___	___
11. Teacher directs students to change roles	___	___	___
12. Teacher resets timer for 10 minutes	___	___	___
13. Teacher computes and records points	___	___	___
14. Teacher commends winning team	___	___	___
15. Teacher encourages losing team	___	___	___
16. Teacher directs collection of materials	___	___	___

**Totals:**             /16 = %