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THE EFFECTS OF STABLE AND FLUID E-TEAM MEMBERSHIP ON STUDENT LEARNING AND PERCEIVED PEER CONTRIBUTIONS AMONG UNDERGRADUATE LITERACY EDUCATION STUDENTS

by
Lorie Lynn Tobler

A dissertation

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy in the Department of Organizational Learning and Performance

Idaho State University

Fall 2015

COMMITTEE APPROVAL

To the Graduate Faculty:

The members of the committee appointed to examine the dissertation of LORIE LYNN TOBLER find it satisfactory and recommend that it be accepted.

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May 6th, 2015

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RE: regarding study number IRB-FY2015-90: Effects of Stable and Fluid e-Team Membership on Student Learning and Perceived Peer Contributions among Undergraduate Liteacy Education Students

Dear Ms. Tobler:

I agree that this study qualifies as exempt from review under the following guideline: Category 1: Normal educational practices & settings. This letter is your approval, please, keep this document in a safe place.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

You are granted permission to conduct your study effective immediately. The study is not subject to renewal.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Tom Bailey (208-282-2179; fax 208-282-4723; email: humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

DEDICATION

I would like to thank and acknowledge the support and valuable feedback from many wise people. Dr. Dotty Sammons provided invaluable, constant support and direction as the chair of my committee. She worked hard to ensure I succeeded, and I feel very blessed to have had her at the helm of this major undertaking, and even more blessed to get to know and learn from her as a person. Dr. Karen Appleby provided her expertise and background from studying teamwork in her field of study and pointed me in helpful directions. Dr. Justin Thorpe used his expertise to aid in the statistical questions, checked my accuracy and calmed my statistical fears. Dr. David Squires was essential in reviewing and revising the literacy content used, and ensuring no errors made it past him. Dr. Tracy Farnsworth was the Graduate Faculty Representative who provided valuable feedback and words of encouragement. Dr. Craig Johnson lent his statistical wisdom, and was key to devising a plan and running my data…he will always be the SPSS guru that everyone needs to have on speed dial.

I dedicate this dissertation to God and family. My daughter (my joy), and my parents' whose expectations and the importance they put on education led me to another educational hill to climb. My father's life and battle with two terminal diagnoses and passing during my program of study provided some of the greatest learning experiences of my life and when combined with the secular knowledge gleaned, I had four and a half years of life changing learning. Thanks to all who loved and supported me, and especially to those who had to live with me and will continue to claim me.

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ABSTRACT

This posttest-only control group design study provides research on whether electronic-team (e-team) membership stability has an effect on team members' perception of peers' contributions and on learning performance. Team membership was either stable or fluid over the course of the study.

The research on collaborative, synchronous e-team learning with stable and fluid teams is limited. Previous research has focused on other characteristics of collaborative e-teams, but e-team membership stability and its postulated effect on team members' contribution had not been examined by an experimental study.

The 82 subjects were undergraduate education students at a private, intermountain west university, enrolled in a face-to-face (F2F) literacy class. The class required four small-group, collaborative, hour-long learning sessions during which the e-teams met virtually, completed group projects, and rated their peers' contributions. Subjects were randomly assigned to e-teams whose membership changed each of the four sessions (fluid) or remained the same (stable). There were 12 fluid teams, and eight stable teams of 3-4 members each. Subjects rated their fellow e-team members' contribution to the session after each meeting. Each e-team also submitted a team project after each session. A repeated measures ANOVA tested whether or not there was a statistically significant difference in perceived peer contributions and learning performance between stable and fluid e-teams.

The results indicated there was a significant difference between stable and fluid e-teams based on perceived peer contributions over the four sessions, with stable e-team members scoring their peers' contributions higher over time. There was a weak correlation between the e-teams' performance scores and perceived peer contribution scores; however, there was no difference in performance based on the fluid or stable team condition. In addition, the number of students perceived as Social Loafers or Free Riders (making little or no contribution to the group) consistently decreased over the four sessions for the stable teams, but varied from session to session for fluid teams.

It is concluded that, while fluid and stable e-teams may be equally effective in terms of student performance, stable e-teams produced higher perceived peer contribution ratings and lower social loafer/free rider ratings over time than fluid e-teams. Future research on the effects of e-team stability in other educational and working contexts is suggested.

CHAPTER I

Introduction

Effectively and efficiently working in a collaborative working environment is an essential 21st century skill. Whether the process of working together is called cooperative learning (Arnold, Ducate, & Kost, 2012; Estes, Liu, Zha, & Reedy, 2014; Johnson, 2013; Roseth, Akcaoglu, & Zellner, 2013) or collaboration (Hsu, Chou, Hwang, & Chou, 2008; Kirschner, Strijbos, Kreijns, & Beers, 2004; Lee &Tsai, 2011), and the grouping is termed teams (Dineen, 2005; Kirschner, Paas & Kirschner, 2009; Mueller, 2012; Olsen, Grinnell, McAllister, Appunn, &Walters, 2012; Robbins, 2009), literature circles (Whittingham, 2013), collaboratories (Dormans & Kok, 2010), or groups (Chidambaram & Lai, 2005; Goggins, Laffey, & Gallagher, 2008; Kirschner, Strijbos, Kreijns, & Beers, 2004), all the labels refer to colleagues, employees, or students working together toward some goal (e.g., product, task, project, assignment, or level of learning).

Technological innovations have impacted "how we live, work, and communicate" (Mishra & Deep-Play, 2012, p.13). With the component of technology use in today's environment, the difference in online versus face-to-face format for teaching has been repeatedly explored, and teamwork in an online environment has been touched upon in research (Cater, Michael, & Varela, 2012; Means, Toyama, Murphy, Bakia, & Jones, 2010). A meta-analysis funded by the United States Department of Education (Means, Toyama, Murphy, Bakia, & Jones, 2010), an empirical study (Cater, Michael, & Varela,

2012), and other research projects (e.g., Artino, 2008) have summarized the differences between face-to-face and online learning environments, as well as illuminated the lack of research on e-teams. There is a plethora of research (over 100,000 articles found with a ProQuest or an EBSCO search) on face-to-face small group work which began decades ago, but "very little for teaching important topics online" (Mueller, 2012, p. 581).

Emerging technologies research (such as educational and instructional technologies) continues to move forward to examine their effectiveness. Just as crayons were the new technology in the early 1900's (Mishra & Deep-Play, 2012), Google Hangout and other online collaboration tools have become the new technology of today and are used in conjunction with e-team learning.

The weaknesses of team learning – such as social loafers and free riders -- have existed in face-to-face formats, and continue to be present in e-learning. Tan and Tan (2009) defined social loafing as a behavior which is less than what is required by the system, and deliberate attempts within groups to withhold effort. Social loafers are members who contribute minimal work, while free riders do almost nothing and ride on the contributing members' work (Arnold, Ducate, & Kost, 2012). With the recurring issue of team members contributing minimal or no effort, the issue continues to be relevant to research as the number of online classes has exponentially grown and is "standard fare" (Botsch & Botsch, 2012, p. 493) at most higher learning institutions, which continue to transition classes to online and hybrid options.

Colleges, universities, Fortune 500 companies, and the United States military have adopted online learning (Artino, 2008), with the first completely online master's degree offered at Walden University in 1995 (Harrison, 2007). In academia, the term *e-learning*

rapidly spread and became a term often used in research studies (Jha, Shahabadkar, & Singhal, 2012; Omidinia, Masrom, & Selamat, 2011; Seok, 2008; Zhang & Nunamaker, 2003).

E-learning or online teaching and learning is a fast growing field of research (see, for example, the *Journal of Online Learning and Teaching*). According to Cook-Wallace (2012), research on e-learning or online teaching and learning is often included in professional [online learning and teaching] journals and publications (p. 64). This relevant and current topic is being explored through e-learning research in Techtrends and in other journals on subjects such as technologies (Kovalik, Kuo, Cummins, Dipzinski, Joseph, & Laskey, 2014), accessibility (iNACOL, 2010), best practices (iNACOL, 2010; Mueller, 2012; Sun, Tai, Finger, Chen, & Yeh, 2008), quality assurance (Artino, 2008; iNACOL, 2010), training and support (Harrison, 2007; Mueller, 2012). "…Whether [group work is] undertaken face-to-face or online, [it] is a source of emotion … psychosocial and psychobiological perspectives of relational experiences… [and] is unique to group work online …" (Robinson, 2013, p. 304).

The United States Department of Education's meta-analysis (Means, Toyama, Murphy, Bakia, & Jones, 2010) cited very few quasi-experimental research projects about e-learning and group learning. "Overall, the controlled studies are too few to support even tentative conclusions concerning the learning effects of using alternative or multiple delivery platforms for online learning" (p. 47). The meta-analysis noted three studies that researched moderating (a teacher or adult moderates online) groups, four that used different types of scripts for online interaction, and two that dealt with delivery platforms.

Real-world situations often require team membership to fluctuate (meaning team members change based on a project's goals). Dineen (2005) has examined the effect of stable and fluid e-team membership on team productivity. He hypothesized that stable teams would not mirror the real world situations, where teams change repeatedly (p. 594) and noted the need for the "effects of turnover" to be researched as an independent variable (p. 597). Dineen found that fewer social loafing behaviors were evident in fluid teams (p. 593), that 69% of the students preferred stable teams, that 28% preferred fluid teams (p. 610), and that the qualitative and quantitative data he collected for social loafing was not consistent (22% of qualitative comments and 5% of quantitative data noted social loafing issues). Based on Dineen's study, it appeared that a study which looked at the effect of e-team membership stability on contributions by e-team members, and on the learning performance of e-teams, was an appropriate next study in the field of research.

The lack of research on the perception of individual contributions to e-teams or virtual teams is a relevant focus to study, as institutions continue to see the importance of team-based learning as a means to prepare students for the workforce. After a working session, the e-Team Survey (with a perceived peer contributions rubric) was used by team members to assess the level of contributions of each team member, as perceived by her peers, and determine if there was a difference between the two e-teams. Building upon Dineen's (2005) research (which used groups which were a mixture of synchronous, asynchronous, and face-to-face), the next step was to determine if social loafers or free riders were more prone to appear in entirely synchronous stable or fluid e-teams (which were indicated based on the e-Team Survey), and if there was a correlation between the

team project scores (learning performance) and perceived contributions (level of participation or contribution). Data gathered from surveys and projects helped to support furthering the research on e-teams. If there was a relationship between underperforming team members and e-team membership stability, this study informs future teachers and researchers whether stable or fluid e-teams are more effective. Determining which type of team membership has fewer social loafers and free-riders will most likely impact educators' instructional decision for which type of membership stability to use. All of these valid items were explored in the continued quest to improve learning and instructional practices.

One intermountain western university has adopted a learning model which promotes student-to-student teaching. Teamwork is one strategy often used in the face-to-face classes and aligns to the university's learning model which stresses teaching one another. The intermountain western university is in the process of designing and developing many online versions of the face-to-face classes. Current research is impacting instructional design decisions, but with the limited scope of research available to direct development of e-teams, the proposed study may provide direction to the university as well as other higher education institutions. Researching e-teams as a strategy to promote learning may be beneficial to the development and design of all online courses at the university, as well as to the body of research on e-teams or virtual teams.

Purpose of the Study

The purpose of this study was to explore one characteristic of e-teams – team stability -- and address whether the contribution of team members, as perceived by their

peers, was affected by e-team membership stability. This study expanded on Dineen's (2005) findings concerning contributions of team members in stable or fluid e-teams, and also examined whether the presence of social loafers (low contributing members) or free riders (non contributing members) differed between stable and fluid e-teams, and determined whether learning performance varied according to team membership stability and perceived contributions. Chidambaram and Tung (2005) studied team size and face-to-face versus online teams and suggested a future study with teams, which were stable because "…groups with a history and a future working on an ongoing basis may be subject to very different kinds of social impact…"(p.162). Dineen (2005) conducted a mixed methods study, which studied fluid and stable teams. Dineen's was the only study which examined team membership stability in an online environment, but it did not have an experimental condition and was limited in scope. Both research projects were foundational to the proposed e-team study, by using teams of four members (Chidambaram & Tung, 2005), studying fluid and stable e-teams (Dineen, 2005), and both called for further research on teams with history.

The research on e-teams is extremely limited, and research on synchronous e-teams even more so (Chidambaram & Tung, 2005; Dineen, 2005; Means, Toyama, Murphy, Bakia, & Jones, 2010). The U.S. Department of Education's meta-analysis comparing online to face-to-face learning reviewed seven studies, which broached the subject of group learning in an online environment (Means, Toyama, Murphy, Bakia, & Jones, 2010). These seven studies indicated that most teachers have students work collaboratively (as opposed to individually) in the online format. Research also suggested hybrid courses that combine online and face-to-face elements, and courses that

integrate collaborative activities are more effective than courses that incorporate independent, online work by the students (Means, Toyama, Murphy, Bakia, & Jones, 2010). Therefore, this study examined a particular characteristic (stability) of a particular collaborative activity (e-teams) in a hybrid setting.

Theoretical Basis of e-Team Learning and Team Membership (Stability)

Historically, constructing knowledge was explored and explained by Piaget's (1954) *theory of constructivism*. He explained how humans have existing schemata and construct knowledge by adding to existing knowledge (assimilation) or by revising previous knowledge (accommodation) and adding to it.

Vygotsky (1978) built upon Piaget's work with his *social constructivism theory*. The learner interacts in a sociocultural environment to solve problems, meaning students learn from, and with each other to construct knowledge. Vygotsky's (1978) *social constructivism* (as cited in Du, Zhang, Olinzock & Adams, 2008) directly applies to social interaction between team members, and is important in the learning process, and in the online learning environment, and the "interaction demands a further elaboration and organization of the schemas" (p.23).

Bruner (1977) also built upon Piaget's work, and compared Piaget and Vygotsky's work (as cited in Driscoll, 2005), and created the *social development theory* (as cited in Wissel, 2008). Bruner believed that theories of development and instruction should go hand in hand (Driscoll, 2005, p. 244). Learning from others (interactions) and their culture are important, along with discovery or inquiry and sequence learning.

Collaborative or team-based learning is grounded in *social constructivism* and the *cognitive load theory (*Sweller, 2011). Kirschner, Paas, and Kirschner (2009) explained

the *cognitive load theory* as being based on learning and the complex cognitive tasks which sometimes overwhelms the learner. Dividing the processes across individuals is useful when cognitive load is high because it allows information to be divided across a larger reservoir of cognitive capacity (31). They note the merits of team learning and the benefit of sharing the cognitive load among members of the team, a "combination of the expanded processing capacity and the distribution advantage, the more complex the task is, the more efficient it will become for individuals to cooperate with other individuals in a fashion that reduces this load" (p.36). They argued that based on the *cognitive load theory,* learning by individuals becomes less effective and efficient than learning by a group of individuals as task complexity increases. They found collaborative learning environment research includes research on size, composition, pursued goal, supporting tools, synchronicity, common knowledge distribution, division of tasks and so forth (p. 32). The way collaborative learning research is conducted leads to inconclusive results obtained, and makes it impossible to draw sound conclusions as to the relative effectiveness and efficiency of collaborative learning environments compared to individual learning environments…[because the] focus [is] on group members rather than on the group as a whole (p.35). They hypothesize that the more complex the learning task is (i.e., the higher the intrinsic cognitive load), the more efficient and effective it will be for individuals to collaborate with other individuals in a manner that reduces the load (p. 39).

The *social impact theory* (Latane, 1981), is founded on the reality that people affect other people in many different ways, and she called this, "social impact…any of the great variety of changes in physiological states and subjective feelings, motives and

emotions, cognitions and beliefs, values and behavior…as a result of real, implied, or imagined presence or actions of other individuals" (343). The three types of social impact factors explained were the strength, immediacy, and number of people.

The number of people refers to how many people are involved (in the group and those outside the group). Immediacy means "closeness in space or time and absence of intervening barriers or filters" (p. 344). Strength refers to how powerful and intense social sources such as status, age, socioeconomic status, prior relationships, and future power over a person (p. 344). As the number of people in a group increases, the more the group will have an impact (e.g. more work completed) but not proportionately and usually only the first few group members have the most impact (p. 345), " even though total output increased with group size, the output of each member decreased...a process I call social loafing" (p. 353). Social loafing may be explained with "two theoretical dimensions—the dilution effect (where an individual feels submerged in the group) and the immediacy gap (where an individual feels isolated from the group)" (Chidambaram & Tung, 2005, p. 149). Chidambaram and Tung (2005) tested the theory and found less social loafing in groups of four compared to groups of eight and found no difference in groups being physically present or in a virtual group meeting. The social impact of the strength of a group (specifically groups with a history and no history working together) could be studied to determine the outcomes (e.g. effects on student learning, perceived contributions of peers and social loafing).

Research Questions

1) Is there a significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly measured by the e-Team Survey, among undergraduate literacy students at a private, western university?

H_0: There is no significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly measured by the e-Team Survey, among undergraduate literacy students at a private, western university.

H_1: There is a significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly measured by the e-Team Survey, among undergraduate literacy students at a private, western university.

2) Is there a significant difference in the performance scores between stable e-teams and fluid e-teams, as repeatedly measured by the graded team projects, among undergraduate literacy students at a private, western university?

H_0: There is no significant difference in the performance scores between stable e-teams and fluid e-teams, as repeatedly measured by the graded team projects, among undergraduate literacy students at a private, western university.

H_1: There is a significant difference in the performance scores between stable e-teams and fluid e-teams, as repeatedly measured by the graded team projects, among undergraduate literacy students at a private, western university.

3) Is there a correlation between the team projects' scores and the corresponding mean perceived contributions scores of stable and fluid e-teams, as repeatedly measured

by graded team projects and the mean e-Team Survey score, among undergraduate students at a private, western university?

4) Is there a decrease in the proportion of low ratings of perceived contributions over time (four synchronous sessions) for either stable e-teams or fluid e-teams?

Research Design

This was a repeated measures, control group design, "a particular type of study that allows researchers to make cause-effect statements because it manipulates a treatment…" (Mitchell & Jolley, 2010, p. 43). This was an experimental design because a treatment was manipulated and was the only variable that varied (p.624). A quasi-experiment is similar to an experiment but random assignment does not determine which subjects receive treatment (p. 627). The repeated measures control group design used randomly assigned subjects to the control (stable) or experimental (fluid) condition and was an experiment (Borg, Gall & Gall, 1993). All subjects received training in conducting e-teams with the selected web-conferencing technology as well as training in completing the e-team survey. Most subjects completed four, one-hour long team sessions completing a group project and receiving a project grade for each session; which accounted for the repeated measured design. After each e-team session, the subjects completed the e-team survey in which they rated their perceptions of their peers' contributions to the session. The independent variable manipulated was the team membership stability, while group contributions and group performance was the dependent variables, measured by the e-Team Survey and the Graded Project respectively. Table 1 shows the design of the research project.

Table 1

Experimental Posttest-Only Control Group Design

Control group	R		O_1	O_2		O_3	O_4		O_5	O_6		O_7	O_8
Treatment group	R	X_1	O_1	O_2	X_2	O_3	O_4	X_3	O_5	O_6	X_4	O_7	O_8

Note. R = random assignment

X_1-X_4=treatment is fluid teams (new team members each session; control group has stable membership)

O_1 = the first perceived contributions observation

O_3 = the second perceived contributions test

O_5 = the third perceived contributions test

O_7 = the fourth perceived contributions test

O_2 = the first graded team project

O_4 = the second graded team project

O_6 = the third graded team project

O_8 = the fourth graded team project

Definitions of Key Terms

e-Teams (or virtual teams) refers to "the real challenges of doing work and teamwork via the computer." (Mueller, 2012, p. 581). For the purpose of this study, *e-teams* refers to collaborative learning groups that met synchronously online in Google Hangout (using audio and visual capabilities), in groups of four students to complete projects during a one-hour session.

Education or *Literacy Students* refers to Special Education, Early Childhood and Special Education, and Elementary Education major students (excludes Secondary Education major students for the purpose of this study).

Fluid e-teams in this study will had four members per team, and had different team members for each session.

Free-riders do not contribute (Arnold, Ducate, & Kost, 2012; Chidambaram & Tung, 2005; Dineen, 2005; Hsu, Cho, Hwang, & Chou, 2008; Maiden & Perry, 2011;

Mueller, 2012). For the purpose of this study, free-riders may be defined as subjects who did not contribute during the session or who were rated a 0. Individual free-riders were not identified by this study (that is, no individual contribution scores were tabulated or reported); however, the presence of free-riders was indicated by the number of 0 scores on the combined e-Team Survey.

Google Hangout, also commonly called *Google+* is an instant messaging and video chat platform. The e-team sessions took place in *Google Hangout*, with subjects seeing and hearing all team members simultaneously, and possibly using a chat box and sharing their desktop screen. The platform enabled students to synchronously meet and "benefit from a live, dynamic audience and [receive] immediate peer feedback…" (Henricksen, Mishra, Greenhyow, Cain, & Roseth, 2014, p. 48).

Online learning is learning that takes place partially or entirely over the Internet (Means, Toyama, Murphy, Bakia, & Jones, 2010, p. 9). For the purpose of this study, all sessions were entirely online and synchronous.

Perceived peer contributions (PPC) were the peers' perception of an individual's contributions during the session. The perceived contributions were measured by the e-Team Survey. Team members completed the e-Team Survey after each session. They self and peer scored using peer contribution rubrics.

Performing e-team members are students who contributed at the good or outstanding levels during the session, as indicated by scores of 3 or 4 on the e-Team Survey.

Projects included a session on writing, fluency, vocabulary and comprehension content. Each project has the session activity on a handout sheet, which provided specific

and detailed directions (what to define, research, apply, and create). Each project was completed within the timeframe and with the four teammates working collaboratively.

A *session* was an hour long period in which students meet virtually through Google Hangouts. Specific projects were completed during each of the four sessions.

Social loafers have the "tendency…to do less than their potential, [and] is a particularly serious problem plaguing groups" (Maiden & Perry, 2011; Mueller, 2012; Rodomes, 2013; Stark, Shaw, & Duffy, 2007; Tan & Tan, 2008; Wissel, 2008). For the purpose of this study, social loafers may be defined as subjects who contributed at the minimal or fair level during the session, as indicated by a score of 1 or 2 on the e-Team Survey. Individual social loafers were not be identified by this study (that is, no individual contribution scores will be tabulated or reported); however, the presence of social loafers was indicated by the number of 1 and 2 scores on the combined e-Team Survey.

Stability is one characteristic of team membership. Dineen (2005) used the terms stable and fluid to describe team membership. If the e-team members were consistent through the learning time frame, team membership was stable. If the e-team membership changed through the learning time frame, team membership was fluid.

Stable e-teams in this study had four members per team, and had the same team members for each session (membership did not change).

Synchronous indicates team members meeting in real-time while online.

The e-Team Survey was the instrument used in this study to measure participation of team members after each session. The e-Team Survey included the Confidential Peer Ratings (abbreviated as CPRs with the s meaning plural), a simple checklist approach

created by Mueller (2012, p. 585). The CPRs is a system by which individual team members rated the participation of their peers in the e-team session on a scale of 0 (no contribution) to 4 (outstanding contribution). Mueller's CPRs is patterned after a common workplace assessment, the 360 Assessment (Mueller, 2012), which collects peer ratings of team member contribution and participation. In addition to the peer ratings of team members' contributions, the e-Team Survey included questions that addressed the same construct (contribution/participation) in order to determine the reliability of the CPRs approach. The e-Team Survey is explained more fully in Chapter 3 and reproduced in Appendix A.

Limitations

Internal validity is the degree to which a study establishes that a factor causes a difference in behavior. "If a study lacks internal validity, the researcher may falsely believe that a factor causes an effect when it really doesn't" (Mitchell & Jolley, 2010, p. 625). According to Campbell and Stanley (1963), the Posttest-Only Control Group Design has minimal threats to sources of internal validity. Of the "12 common threats to valid inference" (p. 1), the "Sources Of Invalidity For Designs 1 Through 6" table (p. 8) indicates Posttest-Only Control Group Design controls nine factors, with the *Multiple-X Inference* "not relevant", and the *Interaction of Selection and X* and *Reactive Arrangements* as two factors of possible concerns, and none of the twelve factors indicating a "weakness" (p.8).

History, maturation, testing, instrumentation, regression, selection, mortality, interaction of selection and maturation and *interaction of testing and x* are controlled and are factors that do not affect internal validity (Campbell & Stanley, 1963, p. 8).

History refers to "any change in the participants' environment that has nothing to do with the treatment but has a systematic effect on a condition's average score" (Mitchell & Jolley, 2010, p. 322). Often the issue is discussed with the change in environment resulting in a change between the pretest and the posttest. There was no pretest in this study. Each experimental session required new learning which was followed by immediate collection of data from the survey and projects. The two-week window of the study was conducted at the same time of day, during the subject's normally scheduled class, in the subject's normal class environment. There was no drastic change in the environment between the different sessions or within the sessions, so there was not an issue with history.

Maturation is the "natural biological or developmental changes that occur inside the participant" (Mitchell & Jolley, 2010, p. 321). This was not an issue because the study used adult subjects within a two week window, reducing the opportunity for growth and development.

Testing refers to "the practice and experience of taking the pretest [which] changed the participants" (Mitchell & Jolley, 2010, p. 308). Subjects may score better on the posttest if they have taken a pretest. This study did not have a pretest and the four surveys were not affected or dependent on previous or subsequent tests, thus mitigating "the effects of taking a test upon the scores of a second *testing*" (Campbell & Stanley, 1963, p. 5). The concepts learned during the sessions are part of the state's required curriculum, and are only taught in the specific class in the undergraduate program. With the brief survey assessments, subjects did not experience fatigue and did not spend much time completing the assessments, and they completed the brief survey after each of the

four sessions, four surveys overall. To minimize the possibility of subjects being overly taxed, or building up a resistance to completing the survey, the survey was very brief (taking 1-3 minutes to complete the first time and less the following administrations) and subjects were reminded of the value of their honest evaluations.

Instrumentation refers to "changes in the measuring instrument causing changes in scores" (Mitchell & Jolley, 2010, p. 323). The same instrument (the e-Team Survey) was used at the end of each session and the projects were blind-scored by the researcher. The e-Team Survey has been previously piloted and checked for reliability and validity, by two assessment specialists, who also checked data gathered and calculated through the Qualtrics software for accuracy. The actual data was run through SPSS using Cronbach's Alpha and was found to be reliable and valid. The same researcher graded the projects, with the same rigor and standards used for all previous semesters. There were no significant changes to the instrumentation between administrations.

Regression refers to "participant[s]…chosen because" (Mitchell & Jolley, 2010, p. 307) of previous high scores, which will most likely result in inflated random error affecting the measurement. The key to "reduce the effects of random error is to reduce the potential sources of random error" (p.353). The random differences between subjects, standardized testing, random measurement error and data coding were controlled as much as possible. Teams were randomly selected and not selected on "the basis of their extreme scores" (Campbell & Stanley, 1963, p. 5).

Selection refers to groups being different before the treatment was administered. To reduce the threat, random assignment was used to determine the stable and fluid e-teams, and the same participants were studied repeatedly.

Experimental mortality refers to "participants dropping out of the study" (Mitchell & Jolley, 2010, p. 307). Subjects not attending the sessions due to sickness or other reasons could have reduced the sample size to a low number, which may have adversely affected normality and homogeneity. A large sample size was used (82 subjects), but in the case of a sample size below 20, the study would have been suspended. When a team member missed a session, that was factored in when completing the analysis (as long as there were three members of the e-team with data, the mean data was used). To reduce the chance of students missing an e-team meeting, the syllabus stated "attendance is required" and that team projects counted for class credit, which could not be made up. One subject needed to miss two sessions, so he was not assigned to a four member e-team and he completed the two sessions, but his data was not used. All 82 students signed the Consent form (see Appendix B), there was no need not to exclude a student from the study for choosing not to participate.

Selection-maturation interaction refers to a situation if stable and fluid groups "were predisposed to grow apart" (Mitchell & Jolley, 2010, p. 307). The possibility that the different groups would mature differently and respond differently to the study was controlled by using similar adult subjects in a brief two-week window, which were randomly assigned to their teams.

Biases were reduced by the use of random assignment in the process of selecting the e-teams. The subjects had a reduced chance of preconceived expectations or biases by not having interactions among the subjects during class time (the first two weeks of school). Since many of the subjects have the same major, there was a possibility they knew each other from different classes, but for the purposes of this study, the common

class began the study as early as feasibly possible at the beginning of the semester to reduce interactions among the students. The teaching assistants only gave minimal, standardized directions for time constraints (they ensured all subjects started at the same time and notified subjects when there was five minutes of time left to work, one minute left, and when to stop). Data from the e-Team Survey was gathered directly through Qualtrics software, reducing the possibility of human error or bias in administration of the survey and strengthening internal validity.

The two possible concerns for invalidity are *interaction of testing and x* and *reactive arrangements*. The *interaction of testing and x* refers to a test possibly being hampered by sensitization or not. A pretest often "sensitized the audience to the problem, it might, through a focusing of attention, increase the education effect of the X" (Campbell & Stanley, 1963, p. 18). The "unpretested groups remain highly desirable if not essential" (p. 18). Because this was a repeated measures, posttest experimental study, the subjects were repeatedly tested. Each sessions' content and project was different, so while the same generic e-Team Survey was used, there was the underlying factor that the test is based on new information and experience, and new data was required. But there was still the issue that the e-Team Survey sensitized subjects to the nature of the study and increased the "education effect of the X" (Campbell & Stanley, 1963, p. 18). To control for this, the survey was brief, new content was used during the learning sessions, and the survey was part of the normal scoring process routine during the sessions and after, with the out of class required study groups that meet for six weeks.

Reactive arrangements refers to "artificiality of the experimental setting and the students' knowledge that he is participating in an experiment" (Campbell & Stanley,

1963, p. 20). The main threat to internal validity is *reactive effects of experimental arrangements* (Campbell & Stanley, 1963, p. 6). To reduce the threat, the format of the class was not drastically changed due to the study taking place, and the normal routine was followed. The literacy class had in-class projects and quizzes throughout the semester and what was experienced during the study part of the semester was similar to the rest of the semester. The peer contribution rubrics, embedded in the e-Team survey, were used after the two-week study window. The subjects also worked in teams or e-teams outside of class to complete required class work after the in-class study was completed.

The researcher stressed the projects had been required and would continue to be required in the specific class, whether or not a study is conducted. The e-team projects (scored and recorded in the class grades) counted for the same credit every semester, regardless of whether or not perceived contributions were being studied. The subjects knew the perceived contribution scores would be kept confidential and not counted towards anyone's class grade. The similar settings, classrooms within the same building which subjects attend for all education classes, were used and created a naturalistic environment. The rooms did not look like lab rooms and were not sterile environments. The standardization of the e-team meeting rooms and directions created a normal class setting, and not a sterile, experimental room environment. The researcher was not in any of the four rooms. Trained assistants conducted the meetings. The assistants only read the standardized directions at the scheduled times, and passed out the project papers at the prescribed time. All possible efforts were made to provide an environment similar to the face-to-face setting, and all e-team environments were very similar.

In keeping with the design, the researcher needed to ensure the subjects' ability to hold e-team meetings in the online environment, or technical problems may have affected the study's results. To ensure all students were adequately prepared for the technological challenges of such meetings, the subjects were trained during the preceding face-to-face class, in both the technology of holding the meetings and using Google Docs. Setting reasonable expectations and providing scaffolding of those expectations is part of the typical learning environment (Gagne, 1970). A threat to inter-rater reliability could have been the technology issues (e.g. one subject was unable to promptly log onto Google Hangout due to computer issues or connectivity, so a replacement laptop had to be used). All subjects were able to access the e-Team Survey through Qualtrics and entered the data needed, so reliability was not affected.

Technological glitches were minimized, resulting in a reduced threat to internal validity. Using Google Hangouts, and ensuring all subjects' laptops (the western university's laptop initiative requires all students to have a laptop with the basic requirements) had audio and visual capabilities, as well as the researcher provided identical headsets to all subjects so they experienced the same virtual environment. Thus, possible environmental effects were controlled and posed no threat to the internal validity in the study.

To help ensure validity, the standardization of the setting and set up of the sessions was important. It was possible the subjects knew other subjects or have worked in face-to-face teams in other classes, posing a limitation. To limit the effects of this possible interaction, the experiment was completed near the beginning of the semester, before personal relationships formed in the class. The subjects met in four different lab

rooms (regular classrooms) for the e-team sessions. No member of a single e-team was in the same physical room with his or her e-team members. The lab time replaced the regularly scheduled face-to-face class time for all subjects. The subjects were randomly assigned (meaning each subject had the same chance of being assigned to any group, because a random assignment generator site determined the subjects in each group) to be in a stable e-team for all four sessions or to be in a fluid e-team, which changed members each session. Online delivery was be through Google Hangout, with audio and visual capabilities used. If e-teams had met at different times or data collection was delayed, it could have posed a possible threat to validity and a limitation.

Another limitation arose by the lack of SPSS being able to run each of the 20 e-teams' perceived peer contribution data, because the variability of each subject changing e-teams during each of the four sessions would not calculate with the individual students who did not change on the same level.

Confidentiality was protected, meaning students did not know how other students' scored their contribution, decreasing the subjects' need to score other subjects the same as they had been scored.

Delimitations

"External validity is the degree to which the results of a study can be generalized to other participants, settings, and times" (Mitchell & Jolley, 2010, p. 624). To aid in external validity (delimitations), and avoid a "major source of [a] problem…[from] a small number of participants"(p. 38), a large sample size of 82 subjects was used and the subjects were typical undergraduate students (similar to others in their major at other schools). A large sample helped to ensure normality and homogeneity, and reduce threats

to internal validity, population and ecological validity. The subjects chose to register (self-selected) for the Literacy class. Because this was a specific population and other populations have not been studied yet, the study results may be generalized to subjects in the same major at the school and also to similar students taking a similar course with the required content (possibly at other universities in the state). A possible threat to generalizing to all populations arises, but further studies with different populations would be appropriate follow-up studies and increase the external validity of this study.

Population validity or making inferences about undergraduate students using a sample of the students is established with *statistical inference* (Bracht & Glass, 1968, p. 440), meaning that a sample will be used to make statements which pertain to the entire population. "The target population is defined as the total group of subjects about whom the experimenter is empirically attempting to learn something" (Bracht & Glass, 1968, p.440). The subjects were a convenience sample but were randomly assigned to be in a fluid or stable e-team, the findings may conclude information regarding the target population (undergraduate literacy students at an intermountain western university), and provide a basis for further research with different subjects in different settings.

To reduce *random error,* the administration of the e-survey, projects, and e-team membership stability has been standardized (Mitchell & Jolley, 2010, p. 166). The directions stated were exactly the same in all four classrooms, the directions and content on the activity handouts were exactly the same, the time frame and when the experiment started and ended was exactly the same for all four classes, and the classrooms were very similar in appearance and temperature. The *experimenter bias* (p. 166) was reduced by using Qualtrics software to administer the e-team survey, the researcher blind-scored the

projects (not looking at the names of students who completed each project), and by using four teaching assistants to read standardized directions at the beginning and end of each session.

It may be possible to generalize the findings for e-team membership stability based on results from the e-Team surveys and curriculum projects to similar Teacher Education departments at universities in Idaho. Generalizing this study for students in other majors and universities outside of Idaho may pose a *population validity* (Bracht & Glass, 1968, p. 440) problem if their demographics do not represent the target population. By narrowly defining the treatment and variables, using a repeated measures ANOVA to determine if there is significant difference between team membership, perceived contributions, and learning performance (and the Tukey HSD post hoc statistical test if needed), the reduction of *personalogical variable and treatments* (p.451) issues will be minimized, and generalization may be acceptable to a similar population in a similar course of study. Further research would aid in building on this research, and using different populations with many, and varied subjects too. The general project structure could easily be changed to other content areas; the same survey could be generalized for any subject in a university class. The "experimentally accessible population and the target population" (p.440) may be different, meaning the subjects used are those enrolled in the class and may differ from the population of students in other majors, which have more sex diversity (education majors are typically female). The research is generalized to a university with mostly males as subjects, in direct contrast to the target population used in the study. Therefore, other researchers replicating the research will show evidence to support external validity more than "the original researcher can do" (Mitchell & Jolley,

2010, p. 330) and aid in effectively generalizing to the same students majoring at the same university, and other populations.

A multi-rater or 360 degree feedback, is a collection of feedback from employees or colleagues working in teams and has been generalized in many different settings (varied workforce settings). The Confidential Peer Ratings (Mueller, 2012) is an adaptation of 360 Assessments, and Mueller has used it in his higher learning setting with business majors, and published the rubric in his article on best practices for online teamwork. Since Mueller did not have data on the reliability and validity of the instrument, a report of Cronbach's Alpha was conducted (Appendix H). The rubric is generic enough to be generalized to many populations, and may be used in various settings and with a wide and diverse population. The e-Team Survey used in this study incorporates Mueller's rubric. It is applicable for the e-teams in the literacy education classes, as well as any other e-team situation. The content, curriculum, and projects used in this study would be applicable for any other university in Idaho's teacher education programs. For the purposes of this study, the researcher checked the reliability and validity of the rubric by surveying similar questions within the e-Team Survey administered at the end of each session, and the previous administration of the e-Team Survey was used to prove as well. The e-Team Survey is also generic enough to possibly be used with other populations.

Some students may experience the *Novelty Effect* or *Disruption Effect* (Bracht & Glass, 1968, p. 459) by using Google Hangout for the first time. The novelty (something new and interesting) and disruption (something out of the normal experience) effects were minimized by subjects experiencing an online training session as a whole class with

the novelty wearing off and the newness worked through. The learning module session was vital to the study, to have the novelty or newness and challenges of the technology worked through before the actual sessions start. In addition, all students are encouraged to take online classes, and all face-to-face classes require the use of Brainhoney for the learning management system, which guaranteed that all students have at least worked asynchronously online.

The researcher had piloted the experiment previously to work through technology and administration issues and to ensure a seamless study. The issue of logging into Google Hangout and using the features was taught and experienced. Directions were modified between sessions for increased clarity based on the students' feedback. The technology issues with connectivity and audio issues were resolved by using the school internet connection after the first two weeks of the semester's beginning (when it is very congested) and by providing students with headsets to aid in audio.

The *novelty* and *disruption effects* were mitigated by structuring the entire semester, with the integration of team-work (face-to-face and online) and the use of the Confidential Peer Rubrics (Mueller, 2012) within the e-Team Survey used repeatedly. The subjects experienced Google Hangout in the face-to-face classroom before they actually worked as e-teams, thus diminishing the novelty of *new* technology, and reducing the opportunity of technical difficulties using Google Hangout. By addressing the limitations (hybrid setting using Google Hangout with all literacy subjects synchronously meeting), and realizing that to generalize this research to completely online or face-to-face students at different educational levels would not be appropriate unless further research is conducted with a repeat of the study, and with different

populations and content areas of study, we can assume external validity of the study. Further, ensuring similar audio and visual capabilities during Google Hangout, the same length of treatment during sessions in all three courses (all three courses being scheduled between 10:15-1:45 to ensure time of day did not affect results), similar physical settings for all subjects, a naturalistic setting (subjects normally scheduled class time was in a setting similar to what was experienced during the study) reduced the subjects' behavior changing due to being a part of the study.

The *Experimenter Effect* (Bracht & Glass, 1968, p. 460) notes subjects may be influenced by the experimenter. To manage this effect, the researcher was not in the rooms during the sessions. Four trained assistants read the brief, standardized directions before and after the sessions; their purpose was to begin and end the session on time and distribute the project sheet at exactly the same time in all classrooms. All assistants were women of similar background, age, major, and ethnicity. The e-Team Survey was administered through a link in an email, with the directions contained and the data collected through the software, thus reducing the opportunity for the researcher's bias to influence the subjects' behavior (p. 439).

To reduce the participant bias, the researcher examined the *Hawthorne Effect.* It was defined by Bracht and Glass (1968), as the "subject's knowledge that he is participating in an experiment [which] may alter his response to the treatment" (p. 457). They found the Hawthorne Effect did not significantly affect student achievement (p.458). Originally, Roethlisberger and Dickson conducted studies in the 1920s at the Hawthorne Electric Plant and concluded the treatment group was reacting to the special attention and not the treatment (Mitchell & Jolley, 2010, p. 167). Often researchers use a

placebo treatment, a treatment with no effect is given, to check for the Hawthorne effect, but in the case of this study that is not feasible. As a result, the researcher attempted to "reduce subject biases by manipulating the treatment in a non-research setting" (p.167), a normal classroom setting and with minimal directions. The directions in the e-Team Survey told the subjects the study would maintain confidentiality with data and would not affect any student's class grade. With no possible grade reduction and confidentiality maintained (no subject knew how fellow e-team members scored them), the subjects' feeling a need to alter their responses to appease team members because team members may respond or retaliate if they see the scores, or subjects feeling harsh or responsible for their team member's low score was reduced

Significance of Study

E-learning has been extensively researched (Jha, Shahabadkar & Singhal, 2012; Omidinia, Masrom & Selamat, 2011; Seok, 2008; Zhang & Nunamaker, 2003), and continues to be researched and included in research journals (Cook-Wallace, 2012, p. 64). The United States Department of Education's meta-analysis (Means, Toyama, Murphy, Bakia, & Jones, 2010), illuminated a gap in research with quasi-experimental research projects on group learning. Chidambaram and Tung (2005) suggested building upon their research and studying groups with a history and with no history together. Dineen (2005) cited a gap in e-team stability research and conducted her mixed methods study on stable and fluid teams. Determining if e-team stability significantly affects perceived contributions and project grades adds to the body of research on e-teams, virtual teams, social loafers, and free-riders (Artino, 2008; Cater, Michael, & Varela, 2012; Chidambaram & Tung, 2005; Dineen, 2005; Means, Toyama, Murphy, Bakia, & Jones,

2010; Mueller, 2012). Examining e-team stability aids in developing and designing more effective teams at the western university and in other school settings. This study may help bridge a current gap in research on e-team characteristics (Chidambaram & Tung, 2005; Dineen, 2005) by determining if there is a difference in perceived contributions and team project scores between fluid and stable e-teams.

CHAPTER II

Literature Review

With the advent of distance learning, the traditional need of collaborating in groups with colleagues or fellow students in a workforce or school setting is still essential and valuable. Cook-Wallace (2012) stated, "the importance of teaching online for higher education institutions is in the forefront of pedagogical research, and rarely is a scholarly education peer reviewed journal without online teaching and learning topics" (p. 64). Teams continue to be an element embedded in learning institutions and the work force. The researcher works at one such learning institution. The intermountain west university focuses on *teaching one another* (teams), and creating online courses. The combined focus of teams in research and in the workplace led the researcher to delve deeper into e-teams.

Searches were conducted using ProQuest and EBSCO (limited to peer–reviewed and published articles). Cooperation, collaboration, and group dynamics provided a breadth of research (over a hundred thousand articles were discovered through EBSCO), which was narrowed down to one specific topic to study. The ProQuest search engine was used and sorted by the most relevant and recent articles using an advanced search with the key words online, synchronous, collaboration, small groups, and social loafing or free-riders. A total of 89 articles were found and studied, as well as the hardcopy of the TechTrends for the last two years.

This literature review will report on the collaboration and cooperation in team learning, the previous research on team stability (team membership), the benefits and drawbacks of team learning, and social loafers and free-riders in teams.

In the context of online, small group learning and work, there is a modest body of research (in comparison to the research on face-to-face small group learning and work). Collaboration (Andres & Shipps, 2010; Chidambaran & Tung, 2005; Dineen, 2005;Lee & Lim, 2012) cooperative learning (Hao-Chang, 2013; Hutchinson, 2007), peer-tutoring (Qureshi & Stormyhr, 2012), Jigsaw (Persky and Pollack, 2009), Literature Circles (Whittingham, 2013), collaboratories (Doormans and Kok, 2010; Moor and Zanden, 2008), computer-supported collaborate learning (Harney, Hogan, Broome, 2012; Kirschner, 2009) and Team Based Learning (Gillespie, 2012; Lee & Lim, 2012; Sovajassatakul, Jitgaruam & Shinatrakool, 2011; Su, 2007) are a few terms which relate to small group learning and work in classrooms. Research concerning benefits, drawbacks and problems with social loafers and free riders in team work is discussed. The review of research illuminated a gap in synchronous e-teams research, as well as research on team stability in online contexts, justifying this research study.

Collaboration and Cooperation in Team Learning

Hutchinson (2007) notes collaborative and cooperative learning are often used interchangeably because both require small groups of students to complete a task together, but he defines cooperative learning as a structure put in place by the instructor to facilitate collaborative learning as the actual social engagement and exchange between the members of a group, the process of working and interacting together to arrive at the completion of the task (p. 359). Researchers do not all agree on the definitions for

collaboration and cooperation. Umble, Umble and Artz (2008) state, "team-based or cooperative learning is where students learn from one another" (p. 17). Arnold, Ducate, and Kost (2012) define cooperation as work by group members as they take responsibility for sub-tasks, which are added to the whole project or task at the end. They view collaboration as having no sub-tasks, but requiring synchronous work of all members (p. 433). Oliveira, Tinoca, and Pereira (2011) argue that collaboration needs a motive and space for negotiations. They defined collaboration as participants at similar level, who share a common goal, and are able to perform together (pp. 1348-1349). Johnson (2013) uses cooperative learning as the process of learning in a face-to-face environment and then uses the term collaborative learning in an online environment, the same except for one is face-to-face and the other online (p. 34). Arnold, Ducate, and Kost (2012) believe educators can create conditions that are conducive to collaboration or cooperation, but how groups tackle the task is ultimately beyond the instructor's control (p. 433). Computer-supported collaborate learning is a term often used by researchers of online team work. According to Harney, Hogan, and Broome (2012), it has varying levels of interaction and dialogue, from emails, discussion forums, instant messaging, videoconferencing and others (p. 518). Kirschner, Paas, and Kirschner (2009) define the collaboration process as including discussion, argumentation, and reflection upon the task, which lead to deeper processing of the information, and richer and more meaningful leaning (pp.31-32).

To synthesize the research, often the terms cooperative and collaborative learning are used synonymously, but historically the term cooperative learning has been used in traditional face-to-face classrooms before the use of computers. Since then, the prevalent

use of computers has coined a new term, collaborative learning, and the means of learning is computer-supported collaborated learning (CSCL), a term spawning an international journal, many research presentations at technology conferences and found in literature.Specific jobs or subtasks are associated with cooperative learning, whereas collaboration often requires no specific jobs or subtasks and requires the team to work on the entire project at the same time.

Previous Research on e-Team Stability

Research into groups or teams extends back over the last quarter century. Tuckman's (1965) model of the five stages of group interactions; including forming, storming, norming, performing and adjourning have been widely accepted and an "industry training standard since its inception" (as cited in Mueller, 2012, p.583). Jahng (2012) described forming as the dependency on a leader while the group deals with inclusion and safety concerns, storming as the time of counter-dependency and fighting over group goals and procedures, norming is the time when trust amongst members is built by negotiation and accepted procedures, and the stage of performing is when the team is very productive and effective (p.3). In a qualitative study, Jahng (2012) applied Tuckman's stages and found that the more a group worked collaboratively, the more they moved through Tuckman's stages, although she noted some stages were skipped and multiple stages occurred at the same time in different groups (p.13).

Chidambaram and Tung's (2005) experimental study on social loafing in technology supported groups was based on Latane's (1981, as cited in Chidambaram & Tung, 2005) *social impact theory*, which explains the phenomenon of some team members' lack of effort in team settings. The theory is based on the belief that individuals

are sources and targets of social impact. The more numerous the sources and targets, the less a person would input into the group work. The stronger and immediate the source, the greater the impact on the target, resulting in more participation (p.150). Another theoretical basis cited is the *immediacy gap* (p.151). The more team members feel isolated, the less they participate. Physical and psychological distances are the two factors which impact whether an individual's contributions are attributed to isolation. Chidambaram and Tung (2005) employed a quasi-experimental design. They used 248 undergraduate business students grouped into 40 teams to study how motivation and circumstantial reasons (size of groups and setting) affect members' contributions and group outcomes (p.150). Their study found no interaction effect between setting and group size. The research concluded team size did affect individual contributions and team products, but location did not affect team performance. It provided new findings to the study on social loafers based on group size and location of teams. The four person groups were more effective than the eight person group, supporting the *social impact theory*. The technology used in place of physical presence of the students did not affect the students with a sense of isolation, *immediacy gap.* Chidambaram and Tung suggested a follow-up study with teams which meet more than once may provide different results on the *social impact theory*. The study only observed groups for a short duration and suggested further research studying teams working on an ongoing basis.

The *social impact theory* was also studied with a mixed methods study conducted by Dineen (2005). Ninety-nine undergraduate business students worked in teams of three to five subjects, teams met by telephone, face-to-face, or by other media. All teams had access to a private bulletin board in WebCT to complete the project. All students

experienced stable and fluid teams. The fluid teams had one or two subjects shift each week (there were four weeks for each type of team membership). The effects of turnover (stability, team membership) as the independent variable was measured with the weekly graded case study and the weekly online peer evaluation. It was found the stable teams had certain benefits: team members knew what to expect from teammates, they reported promoted growth and getting to know people, and they developed trust and greater feelings of camaraderie. However, fluid teams (members changed) also demonstrated benefits: fluid teams encouraged getting to know new people each week, introduced new viewpoints, and created more involvement. Dineen found that introverted members felt they had more influence, had equivalent contributions in fluid and stable online teams, and perceived their teams to be more cohesive. Dineen's study did not provide a strong causal relationship between membership stability and participation, but qualitative feedback indicated 69% of the students favored stable teams. The study proposed here would control the setting while measuring the effect of team stability on participation and learning performance.

How teams are formed and the number of team members needed to be effective has been researched. Hilton and Phillips (2010) researched self-selected and teacher-selected grouping in their grounded theory study, using college accounting students in groups of four students in 84 groups. They found self-selected groups were more motivated to complete the first project (but the difference dissipated); students felt they had higher quality work, communicated more effectively, were more enthusiastic about working in groups, took more interest in members, felt more confident with team members' abilities, and were less likely to do others' work in self-selected groups. It took

longer for teacher-selected groups to create interdependence but the actual grades did not differ based on selection type. Self-selected and teacher-selected groups reported common experiences and outcomes, determining that neither group was more productive or better. Chapman, Meuter, Toy, and Wright (2006) used college marketing students in groups from two to six members to complete projects throughout the semester. They noted randomly selected students felt their groups used time more effectively, were more task oriented, and more like the workplace. They noted self-selected teams usually led to friends choosing to work together and students sitting in close proximity are usually invited to join the group. Cronyism often happens as well, meaning it is hard for the student who has not been friends with the other members previously to become part of a group and feel like part of the group. Mueller (2012) used random team members selected with 2-4 members based on his study of past research and his own class action research. Lamm, Roberts, Snyder, and Brendemuhl (2012) tested the difference between homogenous and heterogeneous teams working through problem solving activities that required collaboration. Eleven university students were separated into two homogeneous groups and one heterogeneous group. The teams were organized by problems solving style. They found heterogeneous grouping should be used instead of homogenous grouping. The researchers found the homogenous group (same problem solving style) was slower, never created a high quality product, and were embarrassed by their results. The heterogeneous group brought varied skills which aided in their success in collaborating and in their product (p.27). Using the previous research, a study should use no more than four members per team, and be randomly selected.

Benefits and Drawbacks of Team Learning

As collaboration in the workplace becomes increasingly common, the need for colleges to develop students with effective teamwork strategies becomes critical (Fredrick, 2008, p. 439; Greenback, Hepworth & Mercer, 2009, p. 46; Umble, Umble & Artz, 2008, p. 2); and working in a group is a highly rated skill for potential employers (Chapman, Meuter, Toy & Wright, 2006). Umble, Umble and Artz (2008) suggest cooperative settings offer better opportunities for individual and group goals (motivational theory), group members develop positive feelings for each other (social cohesion theory), interaction between members is intrinsically rewarding (cognitive elaboration view), and talking amongst members increases learning compared to passive listening based on the opportunity-to-practice model (p.3). Mueller (2012) reviewed existing literature concerning the benefits of, and concerns with, team learning, specifically e-team learning. Mueller cites Berry (2011) for the summary of research on teams focused on traditional face-to-face settings and not on online. Staggers, Garcia and Nagelhout (2008) note there are several studies with university teachers having their students work asynchronously with a team Google Doc, Scwartzman (2006) also claims communication professors also have asynchronous studies as well (as cited by Mueller, 2012, p. 581).

Some of the benefits of team learning noted in the literature include benefits of employability (Chapman, Meter, Toy & Wright, 2010, p.557), students welcoming group work (Greenbank, Hepworth & Mercer, 2009, p.46), associated positive feelings toward group work (Greenbank, Hepworth & Mercer, 2009, p.46), and building personal capital and cultural capital (Greenbank, Hepworth & Mercer, 2009, pp.47-49).

However, Mueller and Marandos (2008, as cited in Mueller, 2012), note "interpersonal skills and presentation skills cannot be effectively taught or learned exclusively online." Drawbacks mentioned are instructors' wariness of group work, lack of student flexibility and availability, procrastination and disorganization, poor time management skills, and student's negative perceptions (Greenbank, Hepworth & Mercer, 2009). Chapman, Meuter, Toy, and Wright (2006), Chapman, Meuter, Toy, and Wright (2010), and Hilton and Phillips (2010) found social loafers and free riders decreased when frequent peer evaluation were used, lessons were taught to students on how to effectively run a meeting, when teams drafted a charter, and when students self-select groups. Because the research is scarce with solely synchronous e-team learning, the articles cited have a mixture of asynchronous and synchronous learning. Several articles were excluded from the research because they only dealt with asynchronous, collaborative learning (Ge, 2011; Hagan, 2012; Heer & Agrawala, 2008; Thompson & Ku, 2006; Zhang, Chen, & Latimer, 2011), or writing or correcting papers (Vassileva & Sun, 2007; Hap-Change, 2013). There was only one article with research on synchronous, stable and fluid e-teams (Dineen, 2005). As Mueller (2012) notes, "There is much scholarly literature regarding the teaching of teamwork and leadership in the physical classroom but very little for teaching…online" (p.581).

e-Team learning is more effective in complex cognitive tasks, such as problem-solving (Kirschner, Paas & Kirschner, 2009), in having different group members contribute different skills, in the division of workload, and in the enjoyment of working with others (Arnold, Ducate & Kost, 2012). Hussain's (2012) qualitative research in several face-to-face classes noted students required "to work in groups and interact in

social settings based on the principle of Vygotsky's social constructivism" (p. 180) preferred group work and "appreciated" the activities. Students also developed confidence and social skills (exchanging greetings and smiles), were more outspoken in class, were more caring to other students, appropriately expressed ideas and their perspective, "developed their personalities", and were more extroverted. While the findings of this study were interesting, it was qualitative research measured by observations and did not focus on online learning.

Olsen, Grinnel, McAllister, Appunn, and Walters (2012) conducted a grounded theory study that evaluated six business faculty working collaboratively to complete research projects, while studying the impact of video on team interaction and effectiveness. The use of Webcam for team meetings was found to increase enjoyment, focus attention, decrease multitasking, and promote trust among members. Another study on the benefits of using Webcams found that most students entered and participated in online synchronous discussions (Du, Zhang, Olinzock & Adams, 2008). Wang, Jaeger, Liu, Guo, and Xie (2013) found using technology such as Adobe Connect improved online learning by enriching synchronous interactions in audio, video and text formats, encouraging student collaborations, "increasing both social and teaching presence…providing students with instant feedback…boosting student motivation to learn and self-efficacy" (p. 25).

Another benefit to e-team learning is that boundaries of space and time do not interfere with the learning (Goggins, Laffey & Gallagher, 2011). The cognitive load with group learning is more effective and efficient by sharing a high load of information across cognitive capacity (Kirschner, Paas, & Kirschner, 2009). In addition, virtual teams

have a stronger relationship between work processes and trust then collocated (face-to-face) teams (Powell, Galvin & Piccoli, 2006).

Drawbacks mentioned are instructors' wariness of group work, lack of student flexibility and availability, procrastination and disorganization, poor time management skills, and students' negative perceptions (Greenbank, Hepworth & Mercer, 2009). Often teams do not support team members who are passive or overly domineering (Fredrick, 2008, p. 439).

Social Loafers and Free-riders

Another recurring drawback theme in the literature is social loafers and free riders. The effect of social loafers and free riders on team learning has been discussed by various researchers (Tan & Tan, 2008; Arnold, Ducate & Kost, 2012). Social loafers contribute minimally and free-riders do not contribute to a team or e-team activity. Dineen (2005) found the end-of-term evaluations reported a higher percentage of social loafing when compared with the weekly evaluations (p. 614). Sometimes students justify contributing more to one project and much less to another project (Arnold, Ducate & Kost, 2012). Interestingly, effort is not a significant predictor of trust in team learning (Powell, Galvin, & Piccoli, 2006).

Using research from a combination of asynchronous and synchronous settings, it appears that there are several strategies which can be used to minimize social loafers and free riders. Two members in a group resulted in no free riders (Arnold, Ducate & Kost, 2102). Smaller groups are preferred and members are more at ease (Du, Zhang, Olinzock, & Adams, 2008). Eight team members are less effective than four on a team (Chidabaram & Tung, 2005). Teams are more productive, and make better decisions when participants

who perceive a high degree of interdependence communicate more frequently and trust each other more, which dissuades social loafing and promotes reliable and dependent conduct (Jang, 2013). Location of members was not found to change group performance (Chidambaram & Tung, 2005); avatars, virtual space (collaboration space), interactive chat may enhance social presence (Konstantinidis, Tsiatos, & Pomportsis, 2009). Fluid teams (team members change) had less social loafing in one qualitative study (Dineen, 2005). Prior experiences with technology enabled members of online small groups to quickly develop practices for coordination (Goggins, Laffey, & Gallagher, 2011).

Summary and Conclusion

Artino (2008) summarized previous research and determined that online group comparisons have most often been compared to traditional classroom groups, with no statistically significant differences in satisfaction, continuing motivation, or achievement; Artino concluded that online groups can be as effective as face-to-face (p.39). Chidambaram and Tung (2005), studying group size, found no difference in face-to-face team performance and online teams, but did find the teams of four students were more effective than eight. They proposed studying teams with more history and time working together, and postulated a study may yield different results (then those found in their study which used fluid teams). According to Kirschner, Paas, and Kirschner (2009), previous research has used team performance data, not individual performance or individual contribution data; therefore, there is a gap in the research about the effect of group learning activities on individual performance and contributions. They support e-team learning (computer-supported collaborative learning) and *cognitive load theory* as a basis for further research.

The researcher did not find an experimental study on perceived team members' contributions in stable and fluid teams using *entirely* synchronous learning. Dineen (2005) studied fluid and stable teams with a mixed method study, but the teams were a mixture of synchronous online, asynchronous online, and face-to-face. Napier and Johnson (2007) conducted research on teamwork satisfaction and only studied teams for two weeks; the limitation was time, and they noted a longer study would possibly change their findings. Chidambaram and Tung (2005) also proposed a follow-up study to theirs with e-teams which have a history of working together.

The research proposed here would build on the previous research and provide new insights into e-teams by using a posttest-only control group design study which looks at the effect of team membership stability (fluid and stable e-teams) on team member participation and team learning performance.

There was little literature that focused on (1) online team learning (wherein the team gets together to teach themselves a topic), (2) online synchronous environments, (3) online team learning over a long time span, and (4) team membership dynamics in that online synchronous environment.

This literature review of online, synchronous collaboration in groups looking specifically at the theoretical basis, benefits, drawbacks (engagement, social loafers, and free riders) and group formation included research which was not entirely synchronous.

The review of previous research indicates that there is limited systematic study of most team learning characteristics, and that many of the studies that have taken place are qualitative or limited in scope. Therefore, although many gaps in the literature exist, the critical area in team learning research in this study is the characteristics of team

membership stability, which will be examined within the context of online, synchronous e-team learning.

CHAPTER III

Method

The purpose of this study was to use e-team collaboration to promote learning in higher education, and look at team membership stability (fluid or stable) as a factor which impacts the level of participation as measured by perceived peer contributions, and learning performance as measured by team project scores. This chapter reviews the population and sampling, experimental treatment, procedures, instrumentation, data collection, and analysis. Associated with this study, this posttest-only control group research study was designed to answer these research questions:

1) Is there a significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly measured by the e-Team Survey, among undergraduate literacy students at a western university?

H_0: There is no significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly measured by the e-Team Survey, among undergraduate literacy students at a western university.

H_1: There is a significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly measured by the e-Team Survey, among undergraduate literacy students at a western university.

2) Is there a significant difference in the performance scores between stable e-teams and fluid e-teams, as repeatedly measured by the graded team projects, among undergraduate literacy students at a western university?

H_0: There is no significant difference in the performance scores between stable e-teams and fluid e-teams, as repeatedly measured by the graded team projects, among undergraduate literacy students at a western university.

H_1: There is a significant difference in the performance scores between stable e-teams and fluid e-teams, as repeatedly measured by the graded team projects, among undergraduate literacy students at a western university.

3) Is there a correlation between the teams' project scores and the corresponding mean perceived contributions scores of stable and fluid e-teams, as repeatedly measured by the team projects and the e-Team Survey, among undergraduate students at a private, western university?

4) Is there a decrease in the proportion of low ratings of perceived contributions over time for either stable e-teams or fluid e-teams?

Population and Sampling

The target population consists of education majors enrolled at a private, midsized university in the intermountain west. In any given academic year, the student population numbers between 1,100 and 1,350. As shown in Table 2, the students are primarily female and Anglo-American (typical of early childhood, special education and elementary education majors).

Table 2

Demographic Information of the Entire Population

Major	M	F	AGE				GPA
			17-18	19-22	23-26	27+	
Spring 2015							
Early Childhood/SE	7	247	20	160	61	13	3.04
Special Education (SE)	12	91	11	66	20	6	2.99
Elementary Education	46	704	93	490	131	36	3.15
Winter 2015							
Early Childhood/SE	10	285	35	180	66	14	3.23
Special Education (SE)	13	109	26	73	17	6	3.18
Elementary Education	50	880	163	570	145	52	3.25
Fall 2014							
Early Childhood/SE	9	297	52	171	68	15	3.25
Special Education (SE)	7	88	27	52	13	3	3.19
Elementary Education	47	924	251	529	140	51	3.28
Spring 2014							
Early Childhood/SE	12	214	15	139	59	13	3.21
Special Education (SE)	9	62	15	40	12	4	3.21
Elementary Education	57	621	83	426	119	50	3.24

Subjects are typically third or fourth-year students (juniors or seniors based upon completion of classes and three prerequisite classes). Subjects are required to have successfully completed three specific prerequisite classes before enrolling in the literacy class.

All students in the three sections are pre-service teachers, seeking a bachelor's degree in Elementary Education, Special Education, or Early Childhood/Special Education. The pre-service teachers have been accepted into their respective programs through a process which requires a minimum grade point average, faculty recommendation, and satisfactory completion of prerequisite classes.

The subjects represented a convenience sample of the population, a set of education students enrolled in a required teacher preparation literacy class. There were three sections offered every semester, with each semester running 14 weeks. A total of 82 students enrolled in one of the three classes, all 82 agreed to participate in the study and signed the Consent form (Appendix B). The entire population during Spring Semester was 1,107 students, the sample represents approximately 7.4 % of the target population.

No subjects had a 503b plan (an Individualized Education Plan that required accommodations) that excluded personal interactions. Each subject participated and was included in the sessions' activities as part of normal course requirements; successful completion of the session activities was part of the typical learning environment (if a student had chosen to not participate in the study they would have still participated in all parts of the session but their data would not have been used). Because the session activities were directly related to the required course content, and because all students were required to successfully complete the class and two high stakes, criterion referenced assessments are part of the state's certification requirements, the project grades of all students were included in the class grading system, regardless of their participation in the study. Only one student's entire data was excluded from the analysis, the student missed

two sessions (due to school official excused absences) and worked by himself to complete those three of the four session activities (his project grades resulted in lower scores compared to the e-teams' grades). For the other session in which he was in attendance, he worked with two other fluid team members (their data was not used for the fourth analysis).

Instrumentation

Two instruments were used in this study. The first was the e-Team survey, which captures information concerning perceived peer contributions, allowing individual session participants to rate their perceived peers' contributions to the session. The e-Team Survey was previously described in terms of components and constituent items, validity, inter-rater reliability, and formatting. Questions five and eight data were used in SPSS and Cronbach's Alpha was run and proved the instrument is reliable and valid (Appendix H). The second instrument was a set of grading criteria, which the teacher uses to assess each team's performance (team project) on the learning objectives of each session. Assessing and gathering data on the perceived contributions of e-team members was the purpose of the e-Team survey.

As shown in Table 3, the survey assesses students' own and peers' contributions/participation using a scoring rubric developed by Mueller (2012, p. 585). This part of the survey was used to obtain data to determine the relationship between e-team membership (stability versus fluidity) and participant contribution. Originally, a total of 20 questions were developed. By using detailed criteria in a table format, four questions were combined into a single question. The demographic questions were deleted because the information was obtained through the universities' Records and Registration

department. A second version of the e-Team Survey was developed and substantially changed after pilot testing. The format change and deletions decreased the number of questions from 20 to 10. Question three had the words "excluding today" added after the first session, after a student asked the researcher after leaving the class for clarification on that part of the survey. As shown in Table 3, perceived peer contribution was assessed several times on the e-Team survey with differently worded questions to ensure reliability and check for consistency.

Table 3

Perceived Peer Contribution Elements of the e-Team Survey

Question #	Question	Question Format
1	You have just completed your collaborative team session. truthfully. Please answer the following questions Your answers will be kept confidential and will not affect your grade or your team member's grades. The information received will be used to research the participation of teams with a history of working together and those who have no history working together. Thank you for answering truthfully and completing the entire questionnaire.	Check box (read or did not read)
2	What is your identifying number (found on the sticker on your nametag)?	Fill-in the blank
3	Excluding today, have you previously worked on a team project (in ED 345) with your team members?	Check box (Y/N)
4	Which team member were you today?	Check box, (A B, C, or D)
5	Please rate yourself and your fellow team members' contributions/participation. How would you rate team member A's contribution/participation?	Check box under one of five detailed

	How would you rate team member B's contribution/participation? How would you rate team member C's contribution/participation? How would you rate team member D's contributions,contribution/participation?	criteria (0-no contributions, 1-minimal, 2-fair, 3-good, contributions or 4-outstanding contribution/participation and leadership)
6	If you had an important class project, which team member (s) would you choose to work with?	Check box member(s) under each team member (choose to work with/ choose not to work with/not applicable)
7	Which score/credit do you expect your group project to receive?	Check box (Full/Partial/ No Credit)
8	Not including yourself, how many other group members fully participated?	Check box (1, 2 or 3)
9	Any other information you would like to share?	Text box

The delivery mode for the e-Team Survey was both face-to-face, with a proctor/interviewer reading the standardized instructions before beginning the survey, and the survey being administered online. Each teaching assistant read the survey instructions, and ensured all respondents completed the survey directly following the e-team session; the survey itself was completed online through the Qualtrics software. The physical presence of a teaching assistant/proctor should lead to higher completion rates (Groves et al, 2009, p. 5.1.1), ensuring no "nonresponse [s]" (p. 5.3.4). To reduce "interviewer variance," all of the instructions were practiced and read by the trained teaching assistants. The assistants were present to hand out project forms at a specific

time, to remind students of time left twice, and to declare the end of the session and a reminder to email the project and complete the e-Team Survey. Answers to the survey may have social desirability bias (p. 5.3.5) because respondents may have wanted to only grade themselves and peers favorably. In an attempt to decrease the social desirability bias, the instructions stressed honesty twice, confidentiality, and that the answers would not affect grading of the project or peers. The survey procedures and questions were read from a script (p. 9.5). The standardized instructions (Appendix C) were read to all subjects and the same direction page given to all subjects at the same time. The subjects left the room when their survey had been submitted.

Experimental Treatment

This posttest-only control group design was an experiment which only manipulated e-team membership stability (independent variable). The control condition, stable e-teams (same team members every session), and the treatment condition, fluid e-teams (different team members every session), were randomly assigned.

The two types of teams were developed within each of the three classes by using random assignment: stable teams whose membership does not vary over the four required meetings, and fluid teams whose membership changes with each of the four meetings. The researcher assigned each subject a number, then used a random number generator site (http://www.aschool.us/random/random-pair.php) to separate the approximately 26-32 students into seven or eight groups (depending on the class size). Of the 82 subjects, 1 student knew he would need to miss two of the sessions so his number was not put into the random generator (his data was not used). Of the 81 students, 1 student was randomly selected to be on a team by themselves through the random number generator site (they

were used as an alternative fluid e-team member). Because each of the three classes needed to have four fluid e-teams in their section for the fluid e-team members to rotate, the study's total number of fluid e-teams resulted in 12, with 8 stable e-teams. For the first and second classes, the numbers one through seven were written on pieces of paper and placed in a cup. The first four group numbers drawn out of the cup were the fluid e-teams, and the remaining group numbers were the stable e-teams. For the third class, the numbers one through six were written on pieces of paper and placed in a cup. The first four numbers drawn out of the cup were the fluid e-teams and the last two were the stable e-teams. A total of 12 fluid e-teams were randomly formed and 8 stable e-teams were formed between the three sections of the classes.

The e-Teams had similar physical environments, the same directions and project requirements, the only variance was their team membership. The stable e-teams met online with the same team members for all four sessions. The Fluid Team Rotation Schedule (Appendix D) illustrates the changes for each online session rotation of team members, ensuring that no fluid e-team members worked with any other team member more than once. The fourth session rotation required four fluid e-team members from one class to attend a class from a different section, to ensure there were no repeated team members in the fluid e-teams. Several attempts were made to keep all the subjects in the same class meeting at the same time, but as shown (Appendix D), during the fourth rotation, several fluid e-team members would have previously worked together. Therefore, one of the four fluid e-team members was a subject from a different class, this met the criteria for fluid e-teams (four new members each session), although it meant that in the last session, some fluid e-team members met outside of their usual class times

(during another class time), but still within the three and a half hour window (of all three classes).

There were several subjects absent due to various reasons. All 20 e-teams' data was used in the study because at least 3 of the 4 team members were present during all four sessions. The stable e-teams always had at least three of the four team members present. The alternate fluid e-team member was used to ensure all fluid e-teams had at least three team members present.

Procedures

To ensure subjects were able to participate in a GoogleHangout (the online meeting application) and with a Google Doc, they completed a training module based on a task analysis (Appendix F) developed specifically for the module. The training module was delivered in the regularly scheduled face-to-face class, using a PowerPoint (Appendix E) which integrated the use of their laptops. The training included instructions and practice on how to use Google Hangout (the application tool for e-team session meetings) and how to create, complete and share a Google Doc. The training module (see Appendix E) was based on Gagne's (1970) Nine Instructional Events. The training objectives were (1) for students to effectively create a Google Doc and send it to the researcher, and (2) for students to create a GoogleHangout meeting, share screen and use audio and video buttons effectively. The training in using Google Hangout helped reduce extraneous variables related to technology issues during the actual e-team meetings (technical difficulties were not entirely eliminated during the sessions but a school technology expert went between the four classrooms, fixing issues, and changing laptops with school laptops if there were major issues which could not be fixed).

After subjects were trained in how to use Google Hangout, the e-teams met four times for one hour each time, during a two-week window. The learning objectives for each session were linked to a testing blueprint. The students learned new content and strategies for vocabulary, writing, comprehension and fluency, which are directly linked to the state literacy curriculum and assessments. Table 4 details the learning objectives from the first team session.

The students defined and provided examples of key words. Then read descriptions of three vocabulary strategies (Semantic Feature Analysis, Concept of Definition, and Four Square) and created actual examples of each strategy for use in an elementary classroom for a subject and grade of their choice. Teams also determined how they would remember two similar strategies by comparing and contrasting and then determining a way to remember both strategies (summarized in a paragraph). All sessions had a detailed task analysis (Appendix F) and objectives linked to the assessment blueprint (Appendix G).

The e-team sessions were only one hour long. Collaboration was used to complete all parts of the project. The project was emailed to the researcher by the end of the session. Students were able to see and hear each other in the Google Hangout and share screens. All groups used a Google Doc. The Internet and project direction sheet aided in developing the students' understanding. The completed project facilitated the teacher's determination that the team met the objectives, and understanding of each term and strategy. The e-Survey was completed directly following the session and took approximately a minute to complete

Table 4

Vocabulary Session Task Analysis

Task (Standard, Objectives)	Bloom's Taxonomy
I. Vocabulary	
a. Students will be able to correctly define and provide an example of key terms (simile, metaphor, personification, denotative meaning, and connotative meaning).	Knowledge and Application
b. Students will be able to correctly create an example of the Semantic Feature Analysis strategy, with at least four types and four categories shown.	Synthesis
c. Students will be able to correctly create an example of the Concept of Definition Map strategy, with at least 4 examples and terms describing the concept.	Synthesis
d. Students will be able to correctly create an example of the Four Square strategy.	Synthesis
e. Students will be able to write a paragraph about how they will remember the differences and similarities between the Four Square and Concept of Definition strategies.	Evaluation

Each e-team member virtually met with other team members located in different classroom via computer (laptops) through the Google Hangout tool. The four classrooms were located within the same building (where education classes are held), but e-team members were not physically proximate to each other. Each classroom was monitored by a teaching assistant. The teaching assistants was trained in the standardized procedures and to help with technical difficulties, should any arise. Four teaching assistants, each in

one of the four rooms, conducted the sessions using standardized instructions (Appendix C) in each of the four rooms, which ensured that all subjects began at the set time, were given the instructions and activity handout (Appendix C) with the project for the day, and were reminded twice of the time left until the end of the hour and when time was finished. The assistants took notes on student's arrival time, comments, how they worked in teams (e.g. use of a Google Doc and if the team divided up the project or worked together on each step of the project) and provided qualitative data, which was not intended or used for the repeated measures ANOVA and in answering the research questions.

Each of the four sessions (Appendix C) focused on the suggested state curriculum (the ICLA Standard II and III) for writing, comprehension, fluency, and vocabulary (Blacklock et al., 2010), a portion of one content area of the required Idaho state standards for pre-service teachers. The projects steps build from lower to higher levels of critical thinking (see Appendix G for Assessment Blueprint) by first using objectives and questions on the knowledge level, then application level, and finally questions needing synthesis and evaluation levels of Bloom's Taxonomy (1956).

The subjects needed to collaborate and/or cooperate and make good use of their time to complete each project. Each e-team was required to submit a team project at the end of each session. The projects were submitted directly to the instructor (through email) following the work session, and each e-team member immediately completed the brief e-Team Survey, (embedded with Mueller's rubric) online using a Qualtrics survey link (emailed to each subject earlier).

In order to pilot the purposed study, permission was gained from the intermountain western university's internal review board, and 26 of the 28 students signed the Informed Consent form (see Appendix B) prior to the pilot. A hybrid course was used to pilot the procedures. The students met face-to-face, except for the e-team activities and study groups, which took place in synchronous, online meetings. The researcher presented the purpose for the study (as it was also presented to the actual students who participated in the actual study) to the pilot study class, explained the study, procedures, and the need for the consent to be signed by those willing to participate in the pilot study. Whether or not they consented to be in the pilot study, they were all required to participate in the sessions and completed the team projects as part of the normal, required class activities. Most students signed the Consent form (Appendix B), and submitted their Gmail address and the verification that their laptops have audio and video capabilities.

All of the procedures were piloted with one class during the Fall 2014 semester, with the e-Team Survey piloted during the Spring and Fall 2014 semesters. The teaching assistants were trained, and met with the researcher after each session. The feedback from teaching assistants provided valuable feedback, which resulted in adjustments and changes being made before the next session. Subjects' feedback also informed decisions and improved the quality of the procedures. Revisions (i.e. technology, timing, directions, and questions asked by students) were made based on results and feedback from the pilot. During the pilot testing of the study, it was found that computer connectivity on campus was not reliable and could not support e-team meetings due to the increased demand for bandwidth in the early weeks of the semester. Therefore, one result from the pilot study

was to move the e-team meetings during the experiment to the third week of the semester. Background sound was an issue during the first session; by the second session, subjects in the same room were placed as far apart as possible and headsets were purchased and used. The timing of the directions were changed to provide subjects 10 minutes to connect with their e-team members, before the directions and activity sheets were distributed. The directions were changed based on questions students asked during each session, to ensure clarity of directions and content presented on the activity sheets. Because a review of the data collected from the training module determined one of the scenarios to be unreliable, the wording was changed to clarify the task. During the Winter 2015 semester, the revised training module (one practice scenario did not provide consistent results so the wording was changed), Google Hangout training, and all four sessions were piloted again.

The researcher presented her proposal to the dissertation committee and it was decided she could conduct the study but with changes to the training module. The training module excluded teaching the perceived contributions rubric and establishing interrater reliability and only included the technology training (Google Hangout and Google Doc). Changes to the Human Subjects Protocol document were made and then submitted and accepted by the internal review board. The approval was received and the study began the third week of the Spring semester, with the Consent Form presented and signed by all 82 subjects (in the three sections of the course offered). The training module was presented and successfully completed by all of the students in their face-to-face class. The sessions began during their next regularly scheduled face-to-face class time, and took place during their normally four scheduled face-to-face class times.

Data Collection

The e-Team Survey measured e-team members' perceived peer contributions, and was one of two dependent variables. The other dependent variable was the learning performance and was measured with e-team project grades.

The subjects accessed the e-Team Survey through a link sent to their school email address, which opened the survey created with the Qualtrics software. They followed the link and completed the survey at the end of each e-team session, supervised by the teaching assistants. The researcher downloaded responses from Qualtrics into Excel and converted them into SPSS.

The e-team projects were emailed to the researcher before the subjects began the survey by one of the team members who volunteered. The researcher scored the projects and entered the data into Excel (and later converted into SPSS).

Data Analysis

This study was an experimental posttest-only control group design, using a repeated measures Analysis of Variance (ANOVA). An ANOVA "compare(s) the between-groups variance to the within-groups variance and thereby determine(s) whether the treatment had an effect" (Mitchell & Jolley, 2010, p. 404). Each individual's data was averaged with the two types of teams, each session data from the two types of teams was used to determine the variance between groups and within-group differences. The stable and fluid e-team groups were compared and determined if there was a statistical difference. The assumptions of a repeated measures ANOVA (randomness, normality, and sphericity) were checked. Randomness was met by designing the study well and ensuring the samples were selected appropriately (random assignment of the sample of

the population). An ANOVA is fairly robust to violations of normality (meaning the population is normally distributed) but was checked with the normal probability plots. The dots were close together, so normality was met. A factorial ANOVA was run with the repeated measurements because the complexity of the statistics was unable to be computed in SPSS with the traditional running of a repeated measures ANOVA (an alternative way to run a repeated measures ANOVA which does not compute sphericity).

The data was analyzed using a two-way factorial ANOVA and the ID as a random factor (which is another way to conduct a repeated measures). The same subjects were repeatedly measured, so there were no individual differences, but the size of the differences may be measured (Gravetter & Wallnau, 2013, p. 437). The data was run using SPSS, and Tukey's post hoc was not needed.

In this study the between-teams and within-teams' variance was measured, using data from the e-Team Survey, as well as the project grades. Only 81 of the 82 subjects' data was used, at least three of the four subjects on each e-team were present and their data was used, the result was 20 e-teams and a sample size of 81 provided many data points. All team members were repeatedly measured, with data collected on the level of participation and learning performance, after each collaborative e-team session. The independent variable was the team membership (fluid and stable e-teams). The perceived contributions and the project grades were the dependent variables. The e-Team Survey used a scoring guide (Mueller's rubric) with five descriptors. The project grades from four assignments were worth 15 points each.

To answer Question 1, *was there a significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly*

measured by the e-Team Survey, among undergraduate literacy students at a western university, each team member submitted four data points from the e-Team Survey's (Appendix D) question five, based on Mueller's (2012) rubric, after each session. If a team member is absent, the other team members' data was still included, with the factor of only three members noted. The subjects' self-score was not used. If more than one team member was absent, the entire team's data would have been excluded because there would not have been an acceptable number of data points from the survey (no e-team's data needed to be excluded). The between team averages determined if there was a significant difference between fluid and stable e-teams and answered research question one.

To answer Question 2, *was there a significant difference in the performance scores between stable e-teams and fluid e-teams, as repeatedly measured by the graded team projects, among undergraduate literacy students at a western university*, each e-team session required a project to be submitted. A total of four project grades for each team were collected and analyzed using an ANOVA (to determine if there was a significant difference between the different types of e-teams over the four sessions).

To answer Question 3, *was there a correlation between the teams' projects scores and the corresponding mean perceived contributions scores of stable and fluid e-teams, as repeatedly measured by the team projects and the e-Team Survey, among undergraduate students at a western university*, both dependent variables (perceived contributions and performance/project scores) results were used to determine if there was a Pearson Correlation. A relationship demonstrating that fluid or stable e-teams have

lower or higher project scores and mean e-survey scores of higher or lower perceived contribution scores answered question three.

Research Question 4, *was there a decrease in the proportion of low ratings of perceived contributions over time for either stable e-teams or fluid e-teams*, each team member submitted three data points from the e-Team Survey's (Appendix D) question five, based on Mueller's (2012) rubric, after each session. The descriptive data determined if there was a decrease in low ratings over time (by comparing results of the four sessions) in either of the types of e-teams, based on the data from the e-Team Survey from question five.

Summary

The posttest-only control group design, controls many threats to reliability and validity but extensive development was needed to ensure that other factors did not interact with the data and affect the results.

The development of this post-test only research design required the development of the training module, session activities and directions, and the e-Team Survey. This experimental study was based on sound instructional design principles. Careful analysis, planning, and development were essential to meeting specific outcomes/objectives (Appendix F) required by the state and was the basis of the projects needed to conduct a posttest-only research project. The session projects were developed to require collaboration and/or cooperation of team members, and the e-Team Survey was developed based on research (Muller, 2012) and appropriate data collection methods (Groves et al, 2009). A proven valid and reliable (Appendix H) survey was essential to gathering data needed for the study, as well as a scored project from each session. Teams

worked together, within the limited timeframe of the session to complete the projects, to a level which demonstrated correctness of the content.

Chapter IV

Results

The purpose of this study was to explore one characteristic of e-teams – team membership stability (fluid and stable), and how team membership affects student learning and perceived peer contributions. Fluid e-teams, and stable e-teams with a history of "… working on an ongoing basis [because they] may be subject to very different kinds of social impact…" (Chidambaram & Tung, 2005, p.162), were studied using a posttest only experimental design. The study built upon Dineen's (2005) findings concerning contributions of team members in stable and fluid e-teams, and also examined whether the presence of social loafers (low contributing members) or free riders (non-contributing members) differed between stable and fluid e-teams, and determined whether learning performance varied according to team membership stability and perceived contributions.

As discussed in Chapter III, a brief e-Team Survey collected perceived peer contributions (PPC) data, and the e-team projects collected provided data on student learning (performance). The subjects' comments from the e-Team survey have been excluded from this section, but they are available in Appendix L, with the analysis of positive and negative comments. However, the data is not needed to answer the four research questions and will not be analyzed in this section. The survey and projects were administered and retrieved before the subjects left each of the four sessions and the data

was used to repeatedly measure the same subjects. A repeated measures ANOVA, Pearson Correlation and descriptive statistics were used to analyze and conclude findings.

The response rate data, the subjects' demographics, and then the findings in relation to each of the four research questions using data analyzed through SPSS (Appendix K) will be explained in detail below.

Response Rate Data

All 82 students (in all three sections of the course) chose to sign the Consent Form (Appendix B) and participate in the study. Randomly selected teams consisted of four team members. Eight teams were randomly selected to be stable and 12 were randomly selected to be fluid (unequal division of e-teams resulted from the need to have four fluid teams in each of the three sections of the course to work with the rotation schedule previously mentioned).

Two subjects (because they needed to miss one or two sessions for various reasons) were used as alternates for fluid e-teams. Not all of the subjects were able to attend all four sessions. Two students missed sessions due to funerals, one for a trip to the hospital with a sick spouse, one for a wedding, and two students missed for other reasons.

All stable and fluid e-teams had at least three of their four e-team members present. Of those present, the subjects completed and submitted the required project and the e-Team Survey (Appendix A).

In order to have all new fluid e-team members during each of the four sessions, some students from different sections of the course attended other sections (different times of class) during the last session. During the last session, an extra fluid e-team was formed, but the analysis was not used because one of the alternates in that e-team,

experienced his first time working with an e-team. The other alternate fluid e-team subject's data, was included when she worked in fluid e-teams two of the four sessions, and her data was excluded when she by herself.

One hundred percent of the subjects present completed the project and e-Team Survey. The attendance of the 82 students was below 100% but did not constitute disregarding the e-Team data because at least three of the four team members were present.

Subjects' Demographics

A total of 1,107 Education Major students enrolled during the Spring semester. Table 5 shows the demographics of that population. The university's enrollment is typically lower for the spring semester when compared to the fall and winter semesters.

Table 5

Spring 2015 Population Demographics of Education Major Students

Major	Male	Female	Age				GPA
			17-18	19-22	23-26	27+	
Spring 2015							
Early Childhood/SE	7	247	20	160	61	13	3.04
Special Education (SE)	12	91	11	66	20	6	2.99
Elementary Education	46	704	93	490	131	36	3.15
Total	65	1,042	124	716	212	55	3.06

The university has adopted the full three-semester model (each semester is 16 weeks long), but more students prefer to attend the fall and winter semesters, and some faculty choose not to teach during the spring semester.

Of the 1,107 students enrolled as Education Major students, 82 students enrolled in the three sections offered for the Education 345 Literacy II course. All 82 students chose to participate in the study and signed the Consent form (Appendix B). A total of 7.4% (82) of the entire population were used as subjects in the sample, with subjects randomly assigned to the experimental condition (stable or fluid e-teams).

Table 6 shows 53 Elementary Education Majors (representing 65% of the entire sample), 17 Early Childhood/Special Education Majors (21%), and 12 Special Education Majors (15%) comprised the sample. The average GPA for the sample population was 3.30, compared to the entire population average GPA of 3.06. Both GPA's are within the B range.

Table 6

Spring 2015 Sample's Demographics

Major	Subjects	Age				GPA
		17-18	19-22	23-26	27+	
Special Education (SE)	12	1	7	4	0	3.26
Early Childhood/SE	17	0	11	6	0	3.18
Elementary Education	53	1	44	4	4	3.47
Total	82	2	62	14	4	3.30

As shown in Table 7, the sample had 75 women (91% of sample) and seven men (9%). In keeping with the population, the sample population was not ethnically diverse, 96% of the sample population was white, and 90% of the entire population was white (with 1% unknown). Of the five ethnic categories (other than white), the sample population only had two of the five categories represented.

Table 7

Spring 2015 Gender and Ethnicity Demographics

Sample Ethnicity	Total	Male	Female
American Indian/Alaskan	1	0	1
Hispanic, Latino	2	0	2
White	79	7	72
Total	82	7	75
Population Ethnicity	**Total**	**Male**	**Female**
American Indian/Alaskan	7	2	5
Hispanic, Latino	63	3	60
White	1,002	57	945
Asian/Asian American	15	2	13
Black/African American	7	0	7
Hawaiian, Pacific Islander	6	1	5
Unknown	7	0	7
Total	1,107	65	1,042

Research Question 1

The first question asked and researched: *was there a significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly measured by the e-Team Survey, among undergraduate literacy students at a private, western university?*

The subjects completed the e-Team Survey after finishing the project during each session. Question five on the survey required students to rate themselves and their peers

using the Confidential Peer Rubric Scores (Mueller, 2012). Their self-ratings were not used in this analysis. The perceived peer contributions (PPC) scores were averaged for each subject (ID noted each subject for each of the four sessions) and then a 2 X 2 factorial ANOVA was run in SPSS. The fixed factors used were condition and session, with ID as the random factor to create a repeated measures ANOVA. A level of significance of α=.05 was used.

Table 8

Repeated Measures ANOVA for e-Teams' Mean Perceived Peer Contributions

Dependent Variable: Averaged Team Members' Perceived Peer Contributions

Source	*SS*	*df*	*MS*	*F*	*Sig.*
Intercept	3800.714	1	3800.714	7526.481	0.000
Condition	0.469	1	0.469	0.928	0.338
ID (Condition)	41.622	80	0.520	3.157	0.000
Session Number	2.094	3	0.698	4.234	0.006
Condition*Session Number	1.940	3	0.647	3.923	0.009

Note. Tests of between-subjects effects of e-Teams' mean perceived peer contributions, as measured by the e-Team Survey question number five, showing that there is a significant difference between stable and fluid e-Teams scores.

Table 8 shows there was no significant difference in the conditions (stable and fluid e-teams), $F(1, 223) = 0.93$, $p = .34$. There was a significant difference with the subjects (ID), $F(80, 144) = 3.16$, $p = .00$. The Session Number was significant also, $F(3, 221) = 4.23$, $p = .01$.

Interestingly, there is a significant difference in the interaction between condition and sessions (F (3, 221) =3.92, p=.01). The condition affected the perceived peer contribution scores over the many sessions experienced by the subjects.

Figure 1 shows how the mean perceived peer contributions are clustered normally and fairly closely together. There are no extreme outliers (meaning a few data points are not in different quadrants from the majority of data points) or perceived score means are not drastically different from the other subjects.

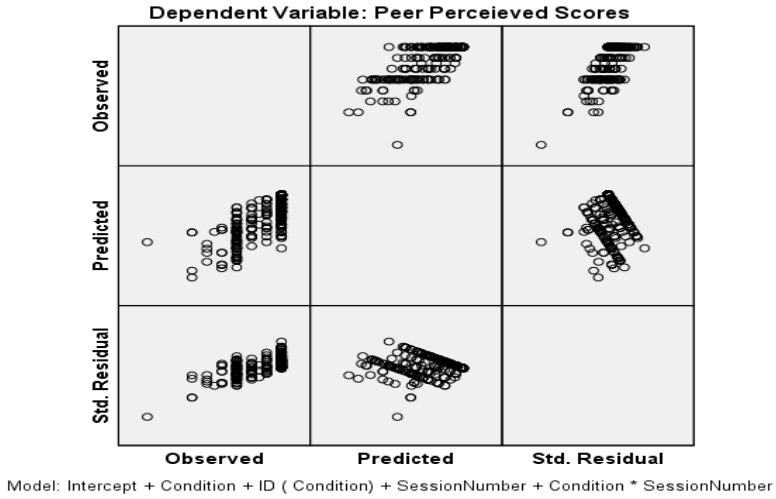

Figure 1. Normal distributions of dependent variable of mean perceived peer contributions.

Figure 2 shows the mean perceived peer contributions scores between the two types of e-teams were different during each session. During Session 1, the stable e-teams averaged lower scores than the fluid (yet both had not previously worked together as teams). The stable e-teams' mean perceived peer contributions were approximately 3.45, as compared to 3.6 for fluid e-teams during Session 1.

In contrast, the stable e-teams received higher perceived peer contributions (approximately 3.78) compared to 3.7 for the fluid e-teams perceived scores during

Session 2, validating the conclusion that e-teams which were stable received higher mean perceived peer contribution scores. The results reversed from Session 1 and 2. Session 3's perceived peers' contributions closely mirrored session two, with stable e-teams' perceived peer average scores slightly better (almost no change), while the fluid e-teams performed slightly worse than they previously had.

Session 4 data clearly illustrates how mean perceived peer contributions continued to increase for stable e-teams and decrease for fluid e-teams. Fluid e-teams averaged their lowest scores of all four sessions, after Session 4. The stable e-teams' mean perceived peer contribution continued to score higher, while the fluid e-teams' perceived peer contributions continued a downward turn and averaged their lowest scores. Whether this is because the e-team members gauged their fellow team members' contributions based on past performances with different members and found them lacking or because the final project required more collaboration is not clear because both possibilities are equally plausible.

No technology glitches were noted in the third and fourth sessions and no derogatory comments were made toward teamwork on the e-Team Survey during Session 3. It could be postulated that with no technology glitches that the subjects should have been able to work more "effectively" together and thus increase their productivity, but the opposite is shown in the results, as a whole (fluid versus stable). The fluid e-teams actually averaged lower perceived contributions when in the last session, while the stable e-teams continued to increase their perceived peer contributions. The stable e-teams continued to increase in perceived peer contributions and fluid e-teams' perceived peer contributions averages decreased after session two.

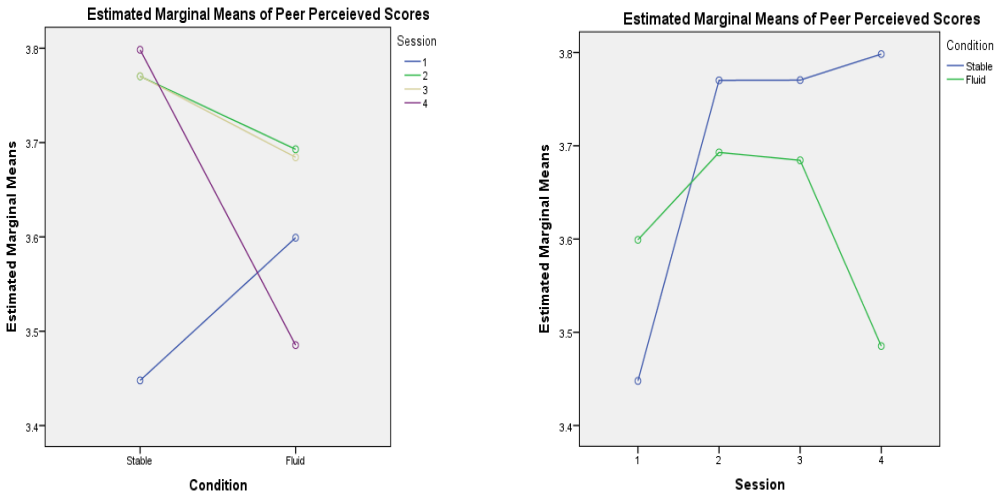

Figure 2. e-Teams' mean perceived peer contributions shown by condition and sessions. There is a significant interaction between the condition and perceived contributions during each of the four sessions.

Table 8 showed there was a significant statistical difference between the stable and fluid e-teams (condition) and perceived peer contributions over time. Based on the mean perceived peer contributions over the four sessions, there is a significant interaction and difference between the condition and the mean perceived peer contributions over the four sessions, with the stable e-teams receiving increasing scores over time, and the fluid e-teams' scores decreasing. Figure 2 shows a graphical difference with the interaction between the condition, mean perceived peer contributions, and the sessions. Based on the data, we fail to accept the null hypothesis, because there is a significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly measured by the e-Team Survey, among undergraduate literacy students at a western university.

Research Question 2

The second question asked and researched: *is there a significant difference in the performance scores between stable e-teams and fluid e-teams, as repeatedly measured by*

the graded team projects, among undergraduate literacy students at a private, western university?

The four projects submitted by each e-team at the end of each of the four sessions was blind-scored by the researcher and the data was repeatedly measured using a repeated measures ANOVA.

Table 9

Repeated Measures ANOVA for e-Teams' Project Scores

Dependent Variable: Project Scores

Source	*SS*	*df*	*MS*	*F*	*Sig.*
Intercept	8255.071	1	8255.071	2934.006	0.000
Condition	1.199	1	1.199	0.424	0.518
ID (Condition)	95.886	31	3.093	1.653	0.064
Session Number	77.481	3	25.827	13.806	0.000
Condition*Session Number	5.999	3	2.000	1.069	0.373

Note. Tests of between-subjects effects of e-Teams' project scores, as measured by the four projects submitted (blind scored by the teacher/researcher), showing that there is no significant difference between stable and fluid e-Team project scores.

The project scores between stable and fluid (condition) e-teams were not significantly different $F(1, 41) = 0.42$, $p = .52$. Interestingly though, the session number was significantly different $F(3, 39) = 13.806$, $p = .00$, based on project scores, as shown in Table 9.

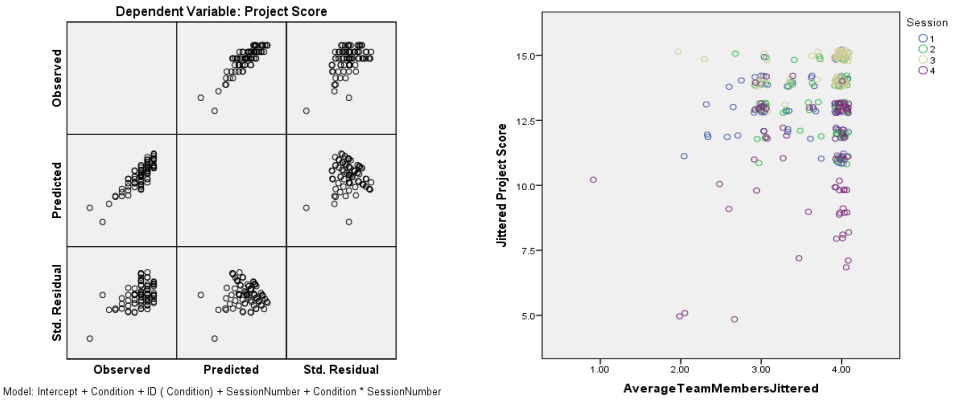

Figure 3. Normal distributions of dependent variable (Project Scores).

Figure 3 shows how the e-team project scores from the four sessions are clustered normally and fairly closely together. There are few data points that are far away from the majority of data. Team project scores (data points) are not drastically different from the other subjects.

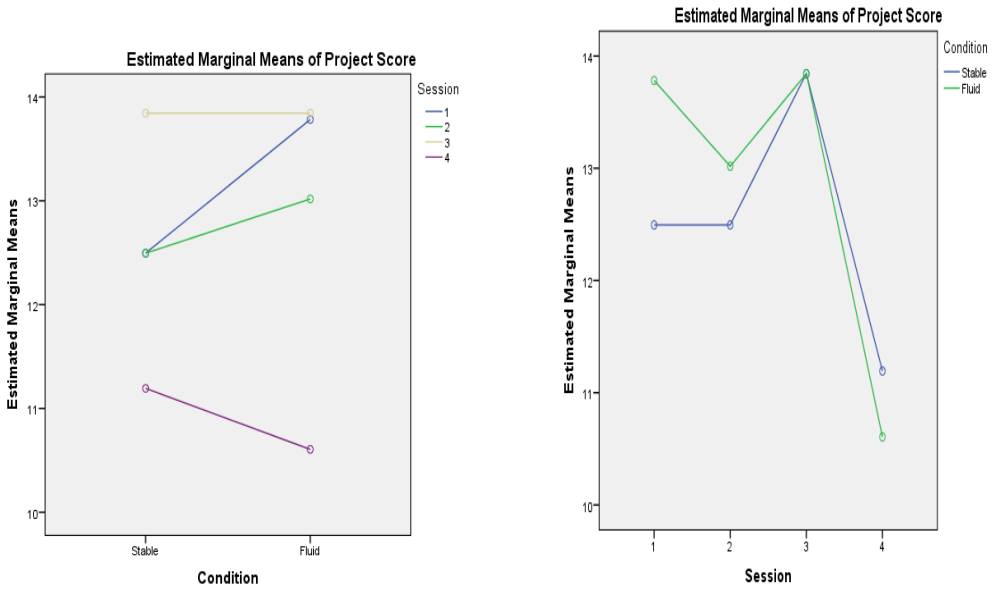

Figure 4. e-Teams' Project Score Estimates of Marginal Means by Condition.

Figure 4 illustrates the average project scores between fluid and stable e-teams for each of the four sessions. There is no significant interaction shown.

Sessions 1 and 2 show fluid e-teams having higher project scores than stable e-teams but the fluid e-teams project scores went down from Session 1 to Session 2, while the stable e-teams scores' stayed the same. Both the fluid and stable e-teams' average project scores increased for Session 3, with stable e-teams having the most drastic increase. Fluid e-teams project scores were slightly higher than those of the stable e-teams (approximately 12.5 compared to 12.7). From Session 1 to Session 3 the stable e-team project scores improved. Session 4 shows both types of teams' scores reduced to their lowest scores, possibly because the content (comprehension) was more difficult than the three previous sessions' content (vocabulary, writing and fluency). Stable e-teams scored slighter better than fluid e-teams for Session 4; they improved and outscored the fluid e-team during Session 4. Analysis of the pattern of improvement and the timing of the two sessions shows that the stable e-teams had a more positive pattern of growth. The different sessions, and the project scores were not significantly different, the project scores and sessions did not demonstrate significant difference between stable and fluid e-teams.

Research Question 3

The third question asked and researched: *is there a correlation between the teams' mean perceived contributions scores and corresponding projects scores of stable and fluid e-teams, as repeatedly measured by the team projects and the e-Team Survey, among undergraduate students at a western university?*

To answer the third question, a Pearson's Correlation analysis was conducted using the mean perceived peer contribution scores and the project scores. Table 10 shows the correlation between the project scores and the perceived contributions scores. There is

a significant correlation between the stable and fluid e-teams' mean perceived peer contributions and projects scores. Based on the analysis, e-team project scores are related (with a weak positive relationship) to the mean perceived peer contributions team members' scores. This means that, if a team has high mean perceived peer contribution scores, it may have a high project score, and vice versa.

Table 10

Person Correlation Analysis of Project Scores and Perceived Peer Contributions

	Peer Perceived Team Averages	Peer Perceived Scores
Project Score		
Pearson Correlation	0.259	0.137
Significance (2-Tailed)	0.020	0.016
N	81	312

Note. Pearson's Correlation Analysis of project scores and perceived contributions by team averages individual peer perceived scores. Project Scores and Peer Perceived Team Averages show a significant relationship at the 0.05 level (2-tailed), (r=.26, p=.02). There is a weak, positive relationship, based on $r = .26$. Project Scores and Peer Perceived Scores show a significant correlation at the 0.05 level (2-tailed), (r=.14, p=.02), but because of the low value of *r* there is a weak relationship.

Figure 5 shows the scattering of e-teams' mean perceived peer contributions and project scores, as well as the individuals' mean perceived peer contributions and project scores. Many of the data points overlap; as a result, the points have been jittered to show the clusters more clearly. The data points are clustered in areas and show the consistency in the scores by the four session colors.

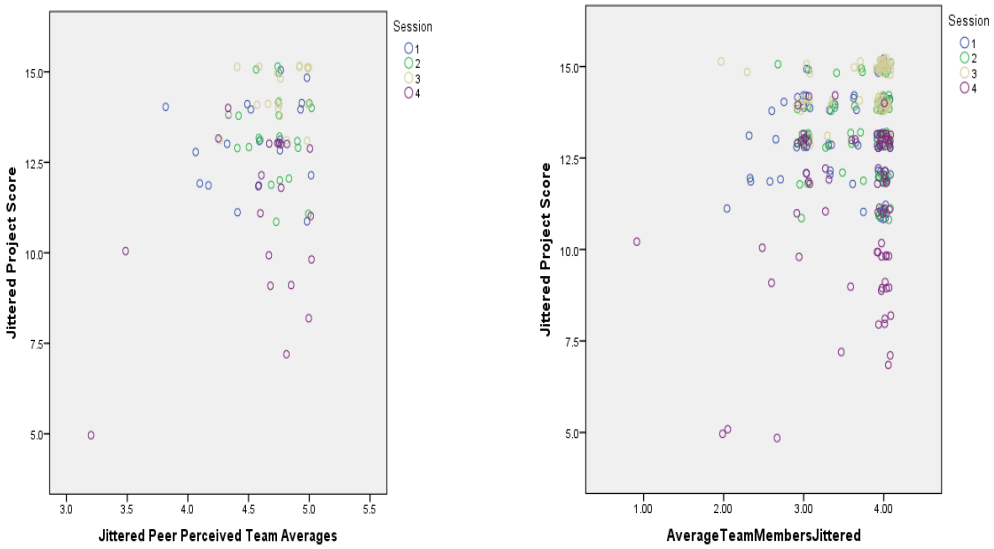

Figure 5. Scatterplot showing the mean perceived peer contributions for teams and project scores by sessions.

Research Question 4

The fourth question asked was: *is there a decrease in the proportion of low ratings of perceived contributions over time (four synchronous sessions) for either stable e-teams or fluid e-teams?*

Data for the perceived peer contributions was obtained from the e-Team Survey, and Microsoft Excel was used to create a table. Figure 6 shows the number of data points from the entire sample. The data has been organized in the table and descriptive statistics has been used in the discussion below. In the stable e-teams, one free-rider (as reported with a score of "0-No Contributions") was reported as present during Session 1, based on the perceived peer contributions. There were no free-riders reported in the following three sessions, and the social loafers diminished from 11 in the first session to one by the last session. Stable e-teams' low and no performing students continued to decrease during each of the subsequent sessions (from 11-3-2-1). In contrast, the fluid e-team subjects only reported four free-riders during Session 4. Both fluid and stable e-teams reported 11

social loafers during Session 1. Fluid e-teams diminished from the first session and second session (11 down to four) but went up to five and then six by the last session.

		Stable					Fluid			
	Condition	0	0	0	0		1	1	1	1
	Session	1	2	3	4		1	2	3	4
Perceived Peer Contributions	0	1	0	0	0		0	0	0	4
	1	7	0	2	0		2	0	1	2
	2	4	3	0	1		9	4	4	4
	3	16	13	13	14		29	36	30	35
	4	59	68	75	69		102	104	103	90
	Free-riders	1	0	0	0		0	0	0	4
	Social Loafers	11	3	2	1		11	4	5	6
	No and Low Performing	12	3	2	1		11	4	5	10
	No and Low Performing Percentage	14%	4%	2%	1%		8%	3%	4%	7%
	Performing	75	81	88	83		131	140	133	125
	Total	87	84	90	84		142	144	138	135

Figure 6. Total number of data points for e-team members' analysis. Each subject submitted 2-3 data points.

The stable e-teams had the highest performing perceived peer contributions by the end of the study. Interestingly, the fluid e-teams had no reported free-riders until Session 4. In the fluid e-teams, the free-riders (as reported with a score of " 0-No Contributions") were not present until the fourth session, while the social loafers (as reported with scores of "1-Minimal Contributions" and "2-Fair Contributions") decreased, increased, and increased again but with an overall decrease when comparing 11 social loafers in Session 1 to six in Session 4. The stable e-teams decreased in free riders and social loafers over time.

Figure 7 shows the data organized by condition during each of the four sessions, and groups low performing students (subjects who received peer contribution scores from 0-2) and performing students (subjects who received peer contribution scores from 3-4).

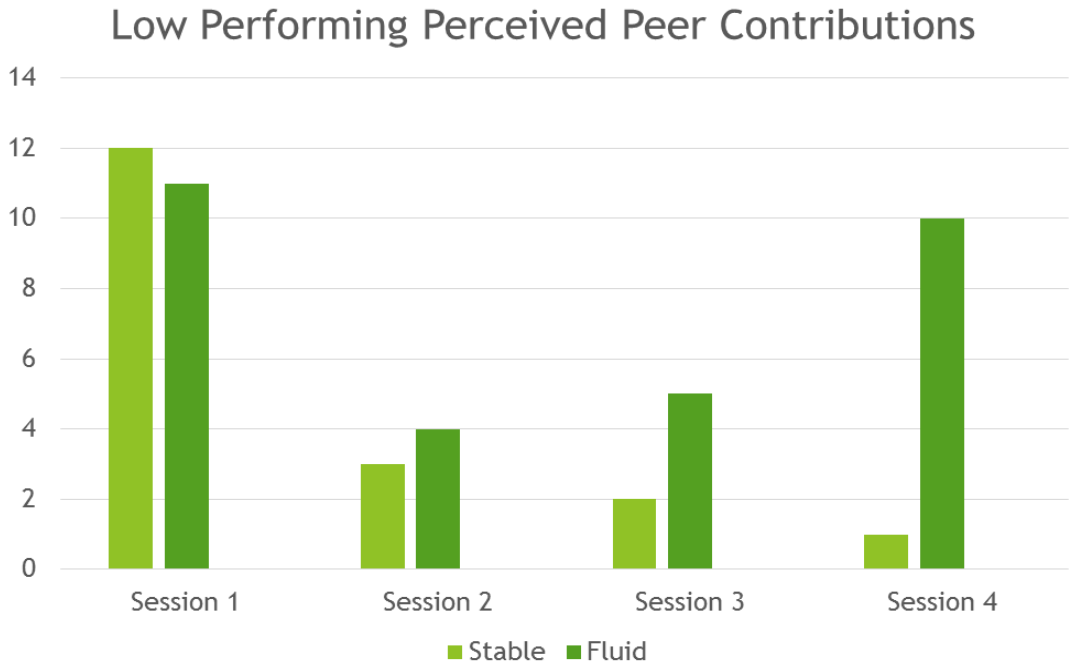

Figure 7. Low performing perceived peer contribution scores by each session.

By analyzing the descriptive statistics, data shows subjects receiving a perceived peer contribution score of a "0" (which determines free-riders) and subjects marked with "1" or "2" (which determines social loafers), several subjects were repeatedly marked as low. In the fluid e-teams, one subject was marked as a social loafer for all sessions except the third session and another student was a social loafer during the first and fourth session. In the stable e-teams, two subjects were social loafers during the first and third sessions, and another for the first and second sessions.

The comments given on the e-Team Survey provided qualitative data. They were not used to answer any of the research questions, but provide further descriptive statistics.

The researcher analyzed each comment as to whether the comments were positive or negative (see Appendix L). The number of negative and positive comments drastically reduced to zero by the third session. The technology issues were noted as the most frequently occurring negative comment during the first two sessions, subjects experienced minimal or no technology glitches during the third and fourth sessions, it would be interesting to determine the impact technology glitches had on the subjects' perceived peer contributions.

Summary

The purpose of this research was to study how team membership stability affects student learning and perceived peer contributions. Question one delved into how team membership affects perceived peer contributions. Subjects completed a brief survey after each session. The data from the survey was used in a repeated measures ANOVA and concluded that there was a significant difference between the condition of stable and fluid e-teams, and sessions. There is a significant interaction with stable and fluid e-teams and the averaged perceived peer scores interact within the different sessions, meaning over time (sessions) the stable e-teams averaged higher perceived peer contribution scores, concluding stable e-team members received higher perceived peer contribution scores. Working together over time caused stable e-team members to score their perceived peer contributions higher.

Question two probed the effect of team membership on student learning. The project scores received from the four projects were not significantly different between the stable and fluid e-teams. Team membership did not significantly affect student learning based on the four project scores. There was a slight increase in scores for the first two

sessions for fluid e-teams and then the stable e-teams scored slightly higher over the last two sessions. Interestingly, there was a significant difference with the session number.

Question three addressed the relationship between student learning and perceived contributions. There was a weak correlation between the perceived peer scores and the project scores. If team members received high perceived peer scores, their project could possibly coincide with a high score (as blind-scored by the researcher), and vice versa.

Question four looked at the occurrence of free-riders and social loafers in fluid and stable e-team to see if they were more prone to plague certain e-teams. Over time, the number of social loafers and free riders decreased in stable e-teams. In fluid e-teams social loafers decreased but free-riders increased.

CHAPTER V

Discussion

Teamwork is an essential part of schools and the workforce. Further research into teamwork is beneficial to the field of research and the application of e-teams. The purpose of this study was to explore one characteristic of e-teams – team stability, and determine the most effective type of e-teams (stable or fluid). This study sought to fill a gap with the research on e-teams by researching the effects of team membership stability on student learning/performance and perceived peer contributions, the correlation between student learning and perceived peer contributions with the different conditions (stable and fluid e-teams), and to determine if social loafers and free-riders are more prone in stable or fluid e-team conditions.

The discussion of findings, future research possibilities and questions, and implications will be presented in this chapter.

Research Findings

One purpose of the study was to determine if e-team membership stability had an effect on members' contribution during the e-team sessions, by measuring perceived peer contribution. A significant interaction between the membership stability conditions (stable or fluid) and session number was found using the data. Over time, the stable e-team members scored their perception of peers' contributions higher. Team members who worked together more than once tended to score their peers more favorably. This builds on Dineen's (2005) qualitative research which indicated 69% of the students

favored stable teams, by contributing new findings to support the use of stable e-teams. However, it remains unclear as to why the perceived peer contribution scores were higher over time for stable e-teams: it may have been because stable groups became more effective at communicating, or that team members built trust and developed a positive relationship over time and scored fellow e-team members more favorable, or it could be a combination of both possible reasons. This study did not address reasons why the perceived peer contribution scores might differ between treatment conditions, and only examined the question of whether the difference existed, which it did. The research findings suggest stable e-team members are more effective when based on perceived peer contributions.

Another purpose to this study was to determine if there was a significant, statistical difference with student learning/performance between the e-teams. There was no difference between the e-team stability and performance (student learning). The student learning was not significantly affected by being in a stable or a fluid e-team, most likely because the students have developed their interpersonal skills to a level at which they can effectively work with many, and varied people within teams that are for a short or long duration. The students may have worked in stable and fluid teams in their other university classes (because the school's learning model specifically has a component which requires students to "teach one another"). The prior training and experience from over 14 years of public education most likely provided students with prior experience working in teams, but working in e-teams may have been a brand new experience. Students may not have had little to none prior experience working in an online format. Since all the subjects were adults, they most likely have learned to adjust to their learning

environment, and with all the subjects in the program studying to become future teachers, they often willingly engage in learning. The content required for the projects is also state required content. The subjects will have two state, high stakes assessments at the end of the semester, testing required curriculum. Subjects should have been motivated to learn the content for the tests, and pass the tests to meet state requirements for certification to become a teacher. The intrinsic (learning to become an effective teacher) and extrinsic (the need to pass two state tests with at least 70% proficiency) motivation may not be true for other populations that this study may be replicated for, that is a consideration which will need to be explored to further establish generalizability.

The research indicates either type of e-team is just as effective as the other (based on student learning or performance), which could be a reason to continue to use both types of e-teams. The last project score was the lowest among both types of e-teams; it would be valuable to switch the order of the projects during the sessions to see what impact that made on the results, there is a possibility the last project was more difficult, the requirements within the project may have been more time consuming, or students did not carefully read the directions and follow all the directions exactly.

The relationship between the teams' project scores and the corresponding mean perceived contributions scores of stable and fluid e-teams, as repeatedly measured by the team projects and the e-Team Survey was explored. There is a weak correlation between the two, meaning that, if a team scored low on perceived contributions, then their project may score lower, and vice versa. This would align to the reasoning that if a team believes they are working together well, they score accordingly and the student learning is related to those scores. Interestingly, the relationship between how the students felt

their team members were contributing and the project scores was not a strong relationship. Students actually felt better about their e-team members' contributions than was reflected with the grade on the projects, and students in the stable e-teams felt even better about their team members' contributions, than the actual project score. The weak relationship between the two could be beneficial to study more in depth in follow-up studies and determine the different communication techniques e-teams used and what aspects of working in stable e-teams contributed to the higher scores.

The occurrence of social loafers and free-riders in the two types of e-teams was of particular interest in this study. Few students were free-riders, meaning they did not contribute based on a perceived peer contribution score of 0. The stable e-teams decreased in free-riders and social loafers (perceived peer contribution score of 1 or 2) over time (sessions). The fluid e-teams decreased with social loafers (but not as much as the stable e-teams) between the Session 1 and 4, in contrast, free-riders increased in the fluid e-teams (Session 1 had zero and Session 4 had four reported perceived peer contribution scores). This research supports the previous research on the importance of four members per team to reduce the occurrence of free-riders and social loafers. Both are a plague to teamwork, and great effort was undertaken to hold students accountable with the use of the e-Team Survey and projects, in the hopes of minimizing both types of problematic team members. The extent the planning and preparation impacted the results was not measured, further research could determine the impact. The students were aware their project grade would be entered in the gradebook and their peers would report on their contributions (although the contributions would not impact their grade in the class and would be kept confidential).

The comments typed by the subject's on the last question asking, "Any other information you would like to share?" are shown in Appendix L. A total of 40 subjects entered comments on the last question on the e-Team Survey after Session 1. Of those 40 subjects, there were 31 negative comments, with all but two of the negative comments in reference to technology and connectivity issues. A total of 17 positive comments were reported from Session 1's e-Team Survey (some subjects typed a positive and negative comment). After Session 2, 21 comments were entered for the last e-Team Survey question. Of the 21 comments, 11 fluid e-team members and 10 stable e-team members commented. All of the negative comments were in reference to technology issues. Interestingly, not one comment was made after Session 3. It would be beneficial to determine the impact technology glitches impacted the students' perceived peer contributions. If students were unable to fully participate because of technology, did their team members score them lower? Or did their team members reduce their expectations of contributions if a team member experienced technological difficulties out of their control? It would be interesting to determine the relationship between the comments and the social loafers and free-riders, the project scores, and the perceived peer contributions in future studies.

Interestingly, a total of two comments were made at the end of Session 4 on the e-Team Survey. The one positive comment referred to teamwork, and the negative comment was in connection to using Google Docs and teamwork. Free-riders only appeared in fluid e-teams during the last session, determining the correlation would be interesting. The complaints did decrease, as well as the social loafers in both types of e-teams over time. This signals further research to conclude the relationship.

Future Research Possibilities and Questions for Future Inquiry

Future research projects may seek to prove generalizability, and to address limitations from this study. By building upon this study, by replicating it and testing different populations and content areas, generalizability will be expanded. The limitations to be explored could include reactive arrangement (students acting different because they know they are participating in a study), and interaction testing (students becoming sensitized to the test because they took it more than once).

The subjects used in this study were not ethnically and gender diverse. The undergraduate students were from a mid-sized western university in a teacher preparation program. Further studies with repeating this study exactly, and using different populations (e.g. different ages of students or workers within different fields of study, other university students with the same majors and with different majors, K-12 public school students, a more ethnically diverse population, a population with mostly males, professionals working out in the workforce, etc.) and fields of study (different content areas and industries) would be appropriate follow-up studies and increase the external validity of this study and generalization. Studying stable e-teams for longer than four sessions, using different content areas to learn during the sessions, having different tasks and assignments, using a different platform than Google Hangout, using teams of two and four team members, or training subjects to use the Perceived Peer Contribution Rubric (Mueller, 2012) prior to the study could also yield useful research.

To help in determining if students reacted to participating in the study, a whole semester of studying the students may see if there was a novelty effect. Using alternative assessments (replacing the e-Team Survey and the projects) would help in determining if

the specific instruments limited the study (especially replacing the tests with observation assessments). Training the students to use the rubric embedded within the e-Team Survey may also affect the results. Another implication for future research may be to specifically change the presented study's fourth session project (which scored the lowest of all four projects) to the first session and determine if new findings appear on how the difficulty of the different projects affected the e-teams. The possibility for future research could be to have students repeatedly use Google Hangout before the first session, and determine the differences between the follow-up study with the presented research (which had one use of Google Hangout in the training module).

To aid in generalizing this research and limiting the constraints, it would be valuable to use the research with many different subjects (K-12, undergraduate, graduate, workers in the workforce, etc.), content areas (math, English, foreign languages, business, secondary Education, history, etc.) and over a longer period of time. Research questions to be explored: Does the number of sessions (four, eight, twelve, etc.) dilute the effect of increased perceived peer contributions for stable e-teams over time? Why do perceived peer contributions decrease over time in fluid e-teams? Do fluid e-teams continue to decrease in perceived peer contributions scores over a longer period of time? Is there an optimal number of working together sessions when the effectiveness of stable e-teams peak? Do specific populations function better with fluid or stable e-teams based on their peer perceived contribution scores? Do different content areas and types of assignments work better with stable and fluid e-teams, as measured by student learning? Do different platforms (Skype, Collaborate, GoToMeetings and Google Hangout) significantly impact student learning or perceived peer contributions when working in fluid and stable e-

teams? Which platforms are preferred by students based on qualitative data after experiencing different content areas and platforms? Do peer's perceived contributions correlate to self-perceived contributions in the two types of teams? Does training the subjects to use the perceived peer contribution rubric establish interrater reliability prior to the study impact the results?

This study addressed four questions, but many more were generated by the end of this study and leave other researchers areas to explore and to add to the body of knowledge about stable versus fluid e-teams.

Implications

Practitioners may use the results to design their e-teams. Using both stable and fluid e-teams are appropriate and will not adversely affect student learning (performance). The workforce often demands teams to work together briefly. Using fluid e-teams will help prepare students for the workforce. Practitioners may help to develop students ability to adapt to stable and fluid e-teams by providing both types of e-teams in the classroom, without concern that student learning will be affected.

The students believed working in stable e-teams causes more team member contributions. So having students work together over time is often seen as more collaborative (based on perceived peer contributions). Practitioners may use the research to form e-teams with the focus to build learning communities, which are together over time. The students' favoring stable e-teams could be highly motivating when they report their attitudes based on their fellow students, and practitioners will be informed as they use this research to develop their e-teams. This aligns with Dineen's (2005) qualitative study that found 69% of students favored stable e-teams (p. 610).

There is a significant but weak relationship between the perceived peer contribution scores and the project scores. This implies that, if team members received high perceived peer scores, there is a weak probability that could mean their project would receive a high score as well. Based on the relationship, the practitioners should not solely use either the perceived peer contribution scores or project scores to indicate the level of student learning and student satisfaction with peers. To have a clear picture of student learning and perceived peer contributions, both must be measured.

The project scores received from the four projects did not show a significant difference between the stable and fluid e-teams. There was a slight increase in scores for the first two sessions for fluid e-teams and then the stable e-teams scored slightly higher over the last two sessions. This leads to the implication that student learning (performance) is not greater in one type of e-team. This information is especially useful to instructional design experts, teachers, researchers and employers when addressing the possible harm of a fluid or stable e-team on performance, and determining which type of team to use. When practitioners consider the results from this study, they should also determine their target audience; many subjects living today and entering the workforce need to be able to work in fluid e-teams with the changing technologies and demonstrate 21st century skills (Mishra & Deep-Play, 2012, p.13), and practitioners may help to develop those skills by using fluid e-teams.

Over time, both fluid and stable e-teams decreased in the number of social loafers (stable decreased more). The stable e-teams also had a decrease in the number of free-riders, while the number of free-riders in fluid e-teams increased. Free-riders (non-contributing team members scored with a 0) only showed up in the Session 1 among the

stable e-teams and only in Session 4 with the fluid e-teams. If a practitioner is experiencing students social loafing or free-riding, using stable e-teams may reduce the occurrence.

The comments from the e-Team Survey show the number of negative and positive comments drastically reduced to zero by the third session. Over time the negative and positive comments decreased. The technology issues were noted as negative comments during the first two sessions, subjects experienced minimal or no technology glitches during the third and fourth sessions. Practitioners should spend ample time to repeatedly have students work with the technology before requiring the use of it, thus reducing frustration for the students. In this research project, the students were trained during a training module, then after two sessions the problems were resolved, so at least three opportunities of working with the technology before proficiency is expected will aid in planning for effective e-teams and reduce technology glitches. Also, recognizing the students may complain about e-team work, but over time the comments should decrease and eventually stop.

In summary, it is important to use both types of e-teams, and while stable e-team members receive higher perceived peer contributions, the team members learning does not increase or decrease based on being in a stable or fluid e-team. It is important to assess both perceived peer contributions and student learning because there is a weak relationship between the two, one does not strongly predict the other. Free-riders and social loafers decreased over time in stable e-teams, that may be of particular interest to practitioners looking to decrease problems of both in their classes. The use of technology and teaching the students to use technology is very important. The use of specific

assessments and content taught should be less as important to generalizability as further research is conducted in other fields of study and with different areas of study, subjects, and assessments used to measure the subjects' learning and contributions.

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APPENDIX A

e-Team Survey

e-Team Survey

You have just completed your collaborative team session. Please answer the following questions truthfully. Your answers will be kept <u>confidential</u> and will not affect your grade or your team members' grades. The information received will be used to research the participation of teams with a history of working together and those who have no history working together. Thank you for answering truthfully and completing the entire questionnaire.

- ○ Read the directions above.
- ○ Did not read the directions above.

What is your identifying number (found on the sticker on your nametag)?

Excluding today, have you previously worked on a team project (in Ed 345) with your team member(s)?

○ No

○ Yes

Which team member were you today?

○ A

○ B

○ C

○ D

Please rate yourself and your fellow team members' contributions/participation.

	0 No contributions	1 Minimal contributions	2 Fair contribution	3 Good contribution	4 Outstanding contributions and leadership
How would you rate team member A's contribution/participation?		◉	◉	○	○
How would you rate team member B's contribution/participation?	◉		○	○	○
How would you rate team member C's	○	○	○	○	○

	0 No contributions	1 Minimal contributions	2 Fair contribution	3 Good contribution	4 Outstanding contributions and leadership
contribution/participation?					
How would you rate team members D's contribution/participation?					

If you had an important class project, which team member(s) would you choose to work with?

	Choose to work with.	Choose not to work with.	Not Applicable
A			
B			
C			
D			

Which score/credit do you expect your group project to receive?

- Full credit
- Partial credit
- No credit

Not including yourself, how many other group members fully participate?

- 1
- 2
- 3

Which group member created the Google Doc?

- A
- B
- C
- D

Any other information you would like to share?

APPENDIX B

Consent form

Consent form

Perceived Contributions in e-Teams

We are asking you to be in a research study.

You do not have to be in this study.

If you say yes, you may quit the study at any time.

Please take as much time as you want to make your choice.

Why is this study being done?

We want to learn more about the contributions made in stable and fluid (changing) electronic teams.

We are asking people like you who are enrolled in the Education 345, Literacy II class to participate in the study.

What happens if I say yes, I want to be in the study?

If you say yes, we will:

- You will complete the regularly required course activities (including team projects and e-Team Surveys). It will take no additional time on the part of the student to complete the research-only components because all components are part of the regularly class activities.
- The repeated measures ANOVA, in a statistical software program will be calculated solely for the research puposes.
- You will be randomly grouped into teams and meet for five one hour session to complete projects. After each session, you will report on the perceived contributions of your peers. You name and scores will be kept confidential and when the researcher runs the data your name will be coded and unidentifiable to anyone else.

How long will the study take?

This study will take four regularly scheduled class periods in May of 2015.

Where will the study take place?

Four rooms in the Hinckley Building will be the sites for the study

What happens if I say no, I do not want to be in the study?

No one will treat you any differently. You will not be penalized.

While you would not get the benefit of being in this study, you would not lose any other benefits (declining will not affect grade or class standing).

What happens if I say yes, but change my mind later?

You may stop being in the study at any time. You will not be penalized.

Your relationship with Brigham Young University Idaho will not change.

Who will see my perceived ratings of contributions of my peers?

The only people who will see your ratings will be the people who work on the study and those legally required to supervise our study.

Your ratings and a copy of this document will be locked in our files.

When I share the results of our study at BYU Idaho, ISU, conferences, and journals, I will not include your name. We will do our best to make sure no one outside the study will know that you are a part of the study.

Will it cost me anything to be in the study?
No.
Will being in this study help me in any way?
There will be no direct benefits for you being in this study.
Will I be paid for my time?
No.
Is there any way being in this study could be bad for me?
Yes, if you have high anxiety interacting with your peers.
We will do our best to protect your privacy. There is a risk of accidental breach of confidentiality. The steps take to minimize that risk are only one computer will store the information, with a password required, and stored in locked office or home of the researcher/Lorie Tobler. She will be the only personnel with access to the data.
What if I have questions?
Please call the head of the study, Lorie Tobler, 208-496-4121 if you:

- Have questions about the study.
- Have questions about your rights.
- Feel you have been injured in any way by being in this study.

You can also call the Idaho State University Human Subjects Committee office at 208-282-2179 to ask questions about your rights as a research subject.
Do I have to sign this document?
No. You only sign this document if you want to be in the study.
What should I do if I want to be in the study?
You sign this document. We will give you a copy of this document to keep.
By signing this document you are saying:
You agree to be in the study.
We talked with you about the information in this document and answered all your questions.

_____
Your Name (please print)

_____ _____
Your Signature Date

APPENDIX C

Standardized Instructions and Activities

Session 1
Vocabulary

Read Directions Carefully

A. Wait for directions from the TA before starting the project.

B. Use the **entire** 45 minutes to complete the project (TA will keep track of time and notify you when there are 5 minutes and 1 minute until the end of the work time).

C. You will need to work together as a team to create 1 document (you may choose to use a Google Doc).

D. One person will submit the project to toblerl@byui.edu (be sure all names are on the project). It will be worth up to 15 points.

E. The TA will provide instructions, and then you will access the survey through BYUI email.

Step 1 *Define the following terms, and create an example. (E.g. Antonym means the opposites, an example would be hot and cold)*

Simile
Metaphor
Personification
Denotative meaning
Connotative meaning

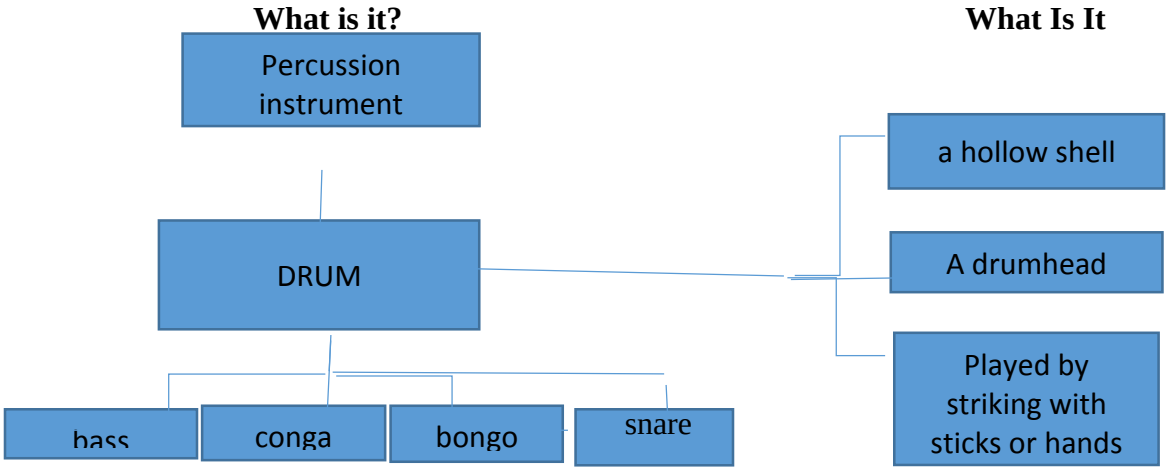
Step 2 *Semantic Feature Analysis (SFA*) is an in-depth, vocabulary strategy. It is a grid/table format and helps students understand the similarities and differences among related words. This strategy can be used before reading to develop vocabulary or after reading to reinforce vocabulary. First, select a category to be analyzed. Write the types down the side of the grid and features across the top of the grid. Then mark **–** if the type does not have the feature, **+** if it has the feature, and **?** if sometimes it has the feature and sometimes it doesn't. Here is an example for boats below. (CORE, 2008).

BOATS

	oars	motor	sails	anchor
ferry	-	+	-	+
sailboat	-	+	+	+
kayak	+	-	-	-
rowboat	+	-	-	+
cruise ship	-	+	-	+

*Now create your own SFA for a classroom lesson. Tell me what lesson you would use it with in just a few words, and completely fill the grid/chart out with +, - or **?** marks.*

Step 3 *Concept of Definition Map* is an indepth vocabulary strategy which helps students develop a clear and concrete idea of what a word really means. The questions- what is it?, what is it like? (features), and what are some examples? are asked and responses are written (CORE, 2008).



Create a Concept of Definition Map for a lesson you would teach to children. Tell me what lesson you would use it with in just a few words, and completely fill the entire graphic organizer.

Step 4 Four Square Vocabulary Map

This is similar to the Concept of Definition Map, but the graphic is different. The questions are the same.

Word	What are some examples?
What is it?	What is it like?

Create an example for a lesson you would teach with the student responses filled in. Tell me what lesson you would use it with in just a few words. How are you going to

remember this strategy? How will you tell this strategy and the Concept of Definition Map apart (literacy students often read a vignette and mix the two up on tests)?

Step 5 The TA will tell you when you have 5 minutes left and 1 minute left. One person emails the assignment to toblerl@byui.edu with all students' first and last names on it.

Step 6 TA will read directions to you and you will complete the survey emailed to you in Brainhoney.

You have completed the assignment. Have a nice day!
TA Vocabulary Directions
For help or issues call 208-403-7885

Before class starts, place name tags so students are separated as much as possible.

1:50-2:05 *Please find your designated desk, plug your computer into a power source and log onto Google Hangout. You will have until 2:05 to reach your team.*

Read these directions after everyone is on Google Hangout.

2:10 *Welcome to the Literacy II class e-team session. You will be completing a vocabulary project in your teams today. Be sure to use the **entire** 45 minutes. I will tell you when you have 5 minutes and then 1 minute left to work.*

If you have connection problems, please raise your hand and I will come to you.

I will only be able to answer questions regarding Google Hangout. It is important to finish the project to the best of your ability. The content is required for this class, so please make sure all members of your team understand all aspects of the project. Do you have any questions?

I will now handout the project sheet and you may begin.

2:50 *You have 5 minutes left.*

2:54 *You have 1 minute left.*

2:55 *Please stop working on the project. Make sure that all students' names are on the project and designate 1 person to email it to toblerl@byui.edu Please access your BYUI email and complete the brief survey that Sister Tobler has sent you. When you have completed the survey, please place your headphones back in the container and bring them and your name tag to me. Then you may leave. Thank you for your participation today.*

Session 2
Writing

Read Directions Carefully

A. Wait for directions from the TA before starting the project.

B. Use the **entire** 45 minutes to complete the project (TA will keep track of time and notify you when there are 5 minutes and 1 minute left to work).

C. You will need to work together as a team to create 1 document (you may choose to use a Google Document).

D. One person will submit the project to toblerl@byui.edu (be sure all names are on the project). It will be worth up to 15 points.

E. The TA will provide instructions, and then you will access the survey through BYUI email.

Step 1 *Answer the following questions.*
What are the steps of the writing process?
What are the 6+1 Traits?

Step 2 *A fractured fairytale is a traditional story that has been changed/fractured/or broken. An example would be The Story of the 3 Pigs, changed to The True Story of the 3 Pigs-where the wolf is the innocent animal and events are skewed in the story to tell how bad the pigs were to him. Create a "student example" of a Fractured Fairytale.*

Step 3 A RAFT is a writing strategy. A third grade teacher tells the students, *"You will write a journal (format) entry explaining the daily life on the Mayflower (topic). Write from the perspective of a pilgrim child (Role). Your audience will be people today. "*

Create your own, original example of a RAFT. List the Role, Audience, Format, Topic and an actual student paper.

Step 4 *A Rebus activity is a writing strategy. The story is created with some of the words replaced by pictures. Create a sample Rebus story for a student. Connect the writing to a subject being taught.*

Step 5 *Daily Oral Language* lesson *or Daily News is a required strategy for teaching grammar in many states. On a large piece of paper or the overhead projector, the teacher will create 3-5 sentences with errors. The students will raise their hands and the teacher will call on them to correct an error. Editing marks and grammar lessons are taught. Create a sample Daily Oral Language lesson, with errors.*

Step 6 *Journal writing is a writing strategy. Create a prompt that would be used for upper grade students. Then create a sample of a student writing to the prompt.*

Explain the importance of journal writing and why it should never be edited.

Step 7 *What other strategies or projects could be used to teach writing?*

Step 8 USE THE ENTIRE 45 MINUTES TO COMPLETE THIS PROJECT.

Step 9 *At the end of 45 minutes (the TA will tell you when), email the assignment to* *toblerl@byui.edu*

Step 10 Listen *to the TA's directions and complete the survey.*

TA Writing Directions

For help or issues call 208-403-7885

Before class starts, place name tags so students are separated as much as possible and place headphones by nametags.

1:50-2:05 *Please find your designated desk, plug your computer into a power source and log onto Google Hangout. You will have until 2:05 to reach your team.*

Read these directions after everyone is on Google Hangout.

2:10 *Welcome to the Literacy II class e-team session. You will be completing a writing project in your teams today. Be sure to use the* ***entire*** *45 minutes. I will tell you when you have 5 minutes and then 1 minute left to work.*

If you have connection problems, please raise your hand and I will come to you.

I will only be able to answer questions regarding Google Hangout. It is important to finish the project to the best of your ability. The content is required for this class, so please make sure all members of your team understand all aspects of the project. Do you have any questions?

I will now handout the project sheet and you may begin.

2:50 *You have 5 minutes left.*

2:54 *You have 1 minute left.*

2:55 *Please stop working on the project. Make sure that all students' names are on the project and designate 1 person to email it to toblerl@byui.edu Please access your BYUI email and complete the brief survey that Sister Tobler has sent you. When you have completed the survey, please place your headphones back in the container and bring them and your name tag to me. Then you may leave. Thank you for your participation today.*

Session 3
Fluency Project

Read Directions Carefully

A. Listen to the directions from the TA before starting the project.

B. Use the **entire** 45 minutes to complete the project (TA will keep track of time and notify you when there are 5 minutes and 1 minute left to work).

C. You will need to work together as a team to create 1 document (you may choose to use a Google Document).

D. One person will submit the project to toblerl@byui.edu (be sure all names are on the project). It will be worth up to 15 points.

E. The TA will provide instructions, and then you will access the survey through BYUI email.

Step 1 *Define the following terms*

Prosody

Fluency

Echo Reading

Choral Reading

Partner/Buddy Reading

Step 2 *One strategy to improve reading fluency is Phrase-Cued Text. A slash (/) is used for a pause and two slashes (//) are used for a longer pause (to take a breath). For example,*

Humpty Dumpty sat on a wall//
Humpty Dumpty had a great fall//
All the King's horses/ and all the King's men/ had scrambled eggs for breakfast again//

Use two nursery rhymes and create examples of the phrase-cued text strategy.

Step 3 *Readers' Theatre*

Search for Readers' Theatres (RT) online and find two sites which have examples.

List the sites, and the one RT you read through-what is the name of the text.

List 8 suggestions for conducting a RT.

Step 4 *Chorally read the following nursery rhyme and confirm you read it orally.*

Humpty Dumpty sat on a wall.

Humpty Dumpty had a great fall.

All the King's horses, and all the King's men,

Had scrambled eggs for breakfast again.

Step 5 Create an expository Reader's Theatre of a book (sample books are located in our regularly scheduled class-a team member may use one). You will need to have parts and retype the text to be a RT.

Step 6 *What is a Poetry Party? How could you effectively conduct one?*

Step 7 *What is a Storytelling Festival? How could you effectively conduct one?*

Step 8 USE THE ENTIRE 45 MINUTES TO COMPLETE THIS PROJECT.

Step 9 *At the end of 45 minutes (the TA will tell you when), email the assignment to toblerl@byui.edu*

Step 10 *Listen to the TA's directions and complete the survey.*

TA Fluency Directions
For help or issues call 208-403-7885

Before class starts, place name tags so students are separated as much as possible and place headphones by nametags.

1:50-2:05 *Please find your designated desk, plug your computer into a power source and log onto Google Hangout. You will have until 2:05 to reach your team.*

Read these directions after everyone is on Google Hangout.

2:10 *Welcome to the Literacy II class e-team session. You will be completing a fluency project in your teams today. Be sure to use the* ***entire*** *45 minutes. I will tell you when you have 5 minutes and then 1 minute left to work.*

If you have connection problems, please raise your hand and I will come to you.

I will only be able to answer questions regarding Google Hangout. It is important to finish the project to the best of your ability. The content is required for this class, so please make sure all members of your team understand all aspects of the project. Do you have any questions?

I will now handout the project sheet and you may begin.

2:50 *You have 5 minutes left.*

2:54 *You have 1 minute left.*

2:55 *Please stop working on the project. Make sure that all students' names are on the project and designate 1 person to email it to toblerl@byui.edu Please access your BYUI email and complete the brief survey that Sister Tobler has sent you. When you have completed the survey, please place your headphones back in the container and bring them and your name tag to me. Then you may leave. Thank you for your participation today.*

Session 4
Comprehension Project

Read Directions Carefully

A. Listen to the directions from the TA before starting the project.

B. Use the **entire** 45 minutes to complete the project (TA will keep track of time and notify you when there are 5 minutes and 1 minute left to work).

C. You will need to work together as a team to create 1 document (you may choose to use a Google Document).

D. One person will submit the project to toblerl@byui.edu (be sure all names are on the project). It will be worth up to 15 points.

E. The TA will provide instructions, and then you will access the survey through BYUI email

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Step 1 *Define the following terms and an example.*

Narrative Text-

Expository/Informational Text-

Book Group/club-

Anticipation Guide-(your example should be one you could use in an elementary class)

Step 2 *The most important activity you will use in the lower grades (K-3) to improve reading is having students read a book that is neither too easy nor too hard, but just right for them. You will need to test each child using a running record to find out his/her* ***Independent***, ***Instructional*** *and* ***Frustration*** *levels. The just right level for your student will be the* ***Instructional Level*** *and is within the student's Zone of Proximal Development (not too hard, not too easy, but just the right amount of a challenge to have optimal growth with the teacher's support and scaffolding). Group the following class of second graders into reading groups (you may only have 5-6 reading groups). Each group may have 3-7 students in a group. It is important to have the students with similar reading levels together. Create the groups and also label the book level each group will be reading (Guided Reading levels are from A-Z and are after each student's name).*

1. Jacque-A 2. Jamie -B 3. April -B 4. Sam-E 5. Lori-F 6. Shawn-Z
7. Jacob-E 8. Mark-H 9. Matt-D 10. Van-J 11. Dana-H 12. Lynda-I
13. Mary-F 14. Marcus-K 15. Jon-L 16. Amy-F 17. Aimee-K 18. Conrad-L
19. Caleb-N 20. Simon –M 21. Shantel-L 22. Jeremy-D 23. Garth-P
24. Megan 25. Kendall-X 26. Kira-Y

Step 3 Your *goal in the lower grades (K-3) should be to read an appropriate book with each child in a small group (students are homogenously grouped, meaning they have a similar Instructional Reading Level). The lesson you should conduct while working with students in reading groups is called a Guided Reading Lesson or Direct Reading Activity. There are 7 basic steps to the lesson. Sometimes the order of the steps may be changed.*

1. Activate Prior Knowledge-you will want to find out what the students know and don't know. You may activate prior knowledge by asking a question or bringing in a visual aid and having them share their comments.

2. Vocabulary-peruse the book and choose 6-12 words which you will directly teach to the children. Write the words on the white board and teach phonetic or morphological elements. Have students see and hear each word, then have them repeat the word.

3. Picture Walk-hand each child a book and have them cover the words with their hand. The students "read the pictures", with the teacher guiding students to use vocabulary in conjunction with pictures. Help children understand the storyline before they attempt to read the words. I will often have the students read all the pictures, except the picture on the last page. It is important to guide the students, for example, if they see a picture of a rabbit running a race, and they say, "The bunny is running the race". Tell the students they are reading the pictures well, and ask, "Can you think of another name for bunny?" Prod students until they come up with the word which will be read in the book (rabbit, not bunny).

4. Choral Read –have the students read the words together in the book. If you are working with emergent or beginning readers, always have the students read with their "magic reading finger". Students should point to the word as they read it together. Most first graders need to track each word they read. If they become very fluent readers, you will just have them put their finger to the side of the paragraph they are reading.

5. Comprehension Questions-before, during and after the students read, use questioning, summarizing, synthesizing and connections to help check and build understanding. For example, if the book being read has steps or a specific order in it, have the students remember the order and also predict what could come next.

6. Independent Read-students will whisper read to themselves, as the teacher listens to each student read. The students should not read in their mind but whisper read.

7. Extension Activities-have the students complete a writing, art, vocabulary or oral language project which is connected to the book they read. Example-journal entry, make own book of story, create an art project of the sequencing of the story, retell the story to an audience, etc.

Use a book from the Guided Reading Library and write the title and level of the book. Then develop a Guided Reading Lesson/ Directed Reading Activity for the book (all 7 steps must be developed).

Step 4 *Research and then define a Discussion Web. Then create a Discussion Web which could be used in an elementary classroom (must be completely developed and filled out).*

Step 5 At the end of 45 minutes (the TA will tell you when), email the assignment to toblerl@byui.edu.

Step 6 *Listen to the TA's directions and complete the survey.*

TA Comprehension Directions
For help or issues call 208-403-7885

Before class starts, place name tags so students are separated as much as possible.

Handout guided reading books and headphones.

1:50-2:05 *Please find your designated desk, plug your computer into a power source and log onto Google Hangout. You will have until 2:05 to reach your team.*

Read these directions after everyone is on Google Hangout.

2:10 *Welcome to the Literacy II class e-team session. You will be completing a comprehension project in your teams today. Be sure to use the **entire** 45 minutes. I will tell you when you have 5 minutes and then 1 minute left to work.*

If you have connection problems, please raise your hand and I will come to you.

I will only be able to answer questions regarding Google Hangout. It is important to finish the project to the best of your ability. The content is required for this class, so please make sure all members of your team understand all aspects of the project. Do you have any questions?

I will now handout the project sheet and you may begin.

2:50 *You have 5 minutes left.*

2:54 *You have 1 minute left.*

2:55 *Please stop working on the project. Make sure that all students' names are on the project and designate 1 person to email it to toblerl@byui.edu Please access your BYUI email and complete the brief survey that Sister Tobler has sent you. When you have completed the survey, please place your headphones back in the container and bring them and your name tag to me. Then you may leave. Thank you for your participation today.*

APPENDIX D

Fluid Team Rotation Schedule

Fluid Team Rotation Schedule

First Session Rotation

Fluid Team #1	Fluid Team #2	Fluid Team #3	Fluid Team #4
1a	2a	3a	4a
1b	2b	3b	4b
1c	2c	3c	4c
1d	2d	3d	4d

Second Session Rotation

#1	#2	#3	#4
1a	1b	1c	1d
2a	2b	2c	2d
3a	3b	3c	3d
4a	4b	4c	4d

Third Session Rotation

#1	#2	#3	#4
1a	1b	1c	1d
2d	2a	2b	2c
3c	3d	3a	3b
4b	4c	4d	4a

Fourth Session Rotation

#1	#2	#3	#4
1a	1b	1c	1d
2b	2c	2d	2a
3d	3a	3b	3c
4c*	4d*	4a*	4b*
*Subjects from other class will be rotated			

APPENDIX E

Training module-PowerPoint

You have been given a paper.

1)Find your unique identifying number and letter.
2) Find the room assignments you will have for the next four class periods.
3) Determine if you will be person A, B, C, or D in each session.
4) Do you have questions?

Technology Team Training

Outcomes

- 1. Effectively use a Googledoc
- 2. Effectively use Google+

*Both will be required for the 4 team sessions.

Objectives

1. Student will be able to correctly create a Googledoc and send it to toblerl@byui.edu

2. Student will be able to create a Google+ meeting, share screen and use audio and video buttons effectively.

Anticipatory Set

Team work.....

Modeling

You will be required to use a Google Doc during your e-Team sessions .

Googledocs are editable (simultaneously) by many users.

1.Create a document under "create new".

2. Name the document under "Title" in the top, left corner.

3. Determine who you will "Share" the document with in the top, right corner.

Let's watch how the three steps are completed.
https://www.youtube.com/watch?v=EKt3-fruLyE

Guided Practice

1. Create a Google Doc and title it "Practice Document".
2. Choose a buddy at your table.
3. Share each other's Google Docs with each other and type your identifying numbers and name in it.

Independent Practice/ Assessment

Please email your Google Doc to toblerl@byui.edu

Headsets

- Please use your own personal headset or the one provided by the teacher. The two plugs need to be plugged in for listening (headphones) and speaking (microphone). If you do not have the two plugin areas, and your computer has a speaker built-in, then just plug in the headphones.
- Be sure to put them back in the container when complete.

Google+ (GoogleHangout)

Objective: Student will be able to create a Google+ meeting, share screen, use audio and video buttons effectively.

Step 1 (Modeling)

- Observe the researcher display her laptop screen through the projector. Note how she begins the session, invites others, shares screen, adjusts audio and visual capabilities.

Step 2 (Guided Practice)

- Students will be paired up with a students sitting at the same table with them. Both will take turns opening a Google+ meeting and practicing all the features.
- Practice going between a Googledoc screen and GoogleHangout.

Closure

Think-Pair-Share

- Explain what you learned about Google+ and Googledocs.

Independent Practice & Assessment

*Be sure to put the headsets "nicely" back in the containers.

At the end of each team session (class) you will need to complete a brief survey.

The survey will be emailed around 11:00 a.m. DO NOT complete the survey until you in the designated classroom, and have completed the session project and are instructed to complete the survey.

You have completed today's session project. Please complete the Technology Proficiency Survey sent to your BYUI Email account now.

APPENDIX F

Task Analysis

Task Analysis For Training module

Task	Bloom's Taxonomy	Prerequisite Skills	Environmental Factors	Importance
Objective 1: Given an instructional module on scoring using the Peer Contributions Rubric, the undergraduate student will correctly score at least three of the four scenarios based on perceived peer contributions while using iclickers.	Evaluation	Basic reading skills.	-Time -Environment -Physical Conditions -Media -Learning Environment	High
Objective 2: Given an instructional module on Google Hangout, the undergraduate student will correctly use the share screen, beginning a meeting, inviting others, audio and visual capabilities while working with another student.	Application	Basic computer knowledge.	-Time -Environment -Physical Conditions -Media -Learning Environment	High

Task Analysis For Sessions

Task (Standard, Objectives)	Bloom's Taxonomy
I. Vocabulary	
a. Students will be able to correctly define and provide an example of key terms (simile, metaphor, personification, denotative meaning, and connotative meaning).	Knowledge and Application
b. Students will be able to correctly create an example of the Semantic Feature Analysis strategy, with at least four types and four categories shown.	Synthesis
c. Students will be able to correctly create an example of the Concept of Definition Map strategy, with at least 4 examples and terms describing the concept.	Synthesis
d. Students will be able to correctly create an example of the Four Square strategy and Concept of Definition Map.	Synthesis
e. Students will be able to write a paragraph on the how they will remember the differences and similarities between the Four Square and Concept of Definition strategies.	Evaluation

Task (Standard, Objectives)	Bloom's Taxonomy
II. Writing	
a. Students will be able to correctly write the steps of the writing process and the Traits of writing.	Knowledge
b. Students will be able to create a fractured fairytale, with a beginning, middle and end to the story.	Synthesis
c. Students will be able to correctly label the role, audience, format and, and create a story using all key parts of the RAFT strategy.	Application and Synthesis
d. Students will be able to create a Rebus, with a beginning, middle and end to the story.	Synthesis
e. Students will be able to create a Daily Oral Language example to be used with an elementary class.	Synthesis
f. Students will be able to create a prompt for an upper elementary class to begin journal writing and a student example of typical upper grade errors.	Synthesis and Evaluation
g. Students will be able to explain several reasons journal writing is important and why it should never be corrected for grammar.	Evaluation
III. Fluency	
a. Students will be able to define prosody, fluency, echo reading, choral reading, and partner/paired/buddy reading.	Knowledge
b. Students will be able to use two nursery rhymes and create examples of the phrase-cued text strategy.	Application & Synthesis
c. Students will be able to search the internet for Readers' Theatres (RT) and find two sites which have examples. The	Application

student will list the two sites, read through one and write the title, and then list 8 suggestions for conducting a RT.	
d. Students will chorally read a nursery rhyme.	Comprehension & Application
e. Students will create an expository Readers' Theatre of a book, including parts and modified text.	Synthesis
f. Students will define Poetry Party and write a response on how to effectively conduct one.	Knowledge & Evaluation
g. Students will define Storytelling Festival and write a response on how to effectively conduct one.	Knowledge & Evaluation
IV. Writing	
a. Students will define and provide an example of narrative text, expository/informational text, book group/club, and anticipation guide.	Knowledge & Application
b. Students will use a list of second graders (27 students) and their reading levels to create homogenous reading groups, and then determine which level of Guided Reading Leveled book each group should read.	Evaluation
c. Students will create a Guided Reading Lesson/Direct Reading Activity with the seven basic steps for one reading group.	Synthesis
d. Students will research and define Discussion Web, and then create a Discussion Web which could be used in an elementary classroom.	Knowledge, Synthesis & Evaluation

APPENDIX G

Assessment Blueprint

Assessment Blueprint

Goal: The undergraduate student will use a rubric to score perceived contributions of their peers, after establishing interrater reliability, and after working in an e-team session to complete a project.

Objective 1: Given an instructional module on the Confidential Peer Ratings Rubric, the undergraduate level student will correctly score at least three of the four scenarios.
1.1 Identify scores of 0-4
1.2 Identify detailed criteria of scores 0-4
1.3 Apply scores of 0-4 and detailed criteria to score a scenario.

Objective 2: Given a team project assignment with detailed instructions, the undergraduate level student will work in teams of four to complete all steps of the project correctly.
2.1 Define key terms
2.2 Write examples of key terms
2.3 Create specific examples of strategies

Objective 3: Given an e-team Qualtrics survey, the undergraduate level student will complete the survey basing their answers on the perceived contributions of their peers who worked in an e-team with them to complete the project during the session.
3.1 Read standardized directions
3.2 Provide demographic information
3.3 Grade peers using detailed criteria (no contributions, minimal contributions, fair contribution, good contribution, and outstanding contributions and leadership).
3.4 Report on if you would like to work with group again.
3.5 Report if there was a group member did not fully participate (social loafers and free riders).
3.6 Predict the score your team project will receive (full, partial or no credit).
3.7 Provide qualitative feedback.

Assessment	Type	Assessment Materials	# of Items	Scoring
Objective 1: Multiple Choice Quiz	Formative and Summative	Training module PowerPoint and iclicker	18 Questions	6 of the last 8 questions must be answered correctly for interrater reliability.
Objective 2: Project	Summative	Project Assignments	4 e-team projects	Full, partial or no credit scores given of the 15 points per project. A total of 60 points possible.

Objective 3: Qualtrics Survey (Multiple choice, drop down menu, short answer)	Summative	Qualtrics Survey	22 Questions	Qualtrics and SPSS will be used to run data.

APPENDIX H

Validity and Reliability Data

Reliability of the e-Team Survey

The Percieved Peer Scores from question five were compared with the answers from question eight through SPSS and Cronbach's Coefficent alpha was run. Alpha is above .70, thus the survey is a good measurement and proven to have internal consistency reliability.

Reliability Statistics

Cronbach's Alpha	N of Items
.792	2

APPENDIX I

Confidential Peer Ratings Use of Authorization

Confidential Peer Ratings Rubric Use Authorization

From: Jeffrey Mueller [mailto:jmueller@nu.edu]
Sent: Tuesday, December 02, 2014 6:17 PM
To: Tobler, Lorie
Subject: Re: 2012 Article-Seeking authorization to use your Confidential Peer Ratings Rubric in my Experimental Research Project

Yes, you have my permission, Lorie, and yes, I created this rubric. The only thing I ask for is a proper citation :). Thanks.

Dr. Jeffrey R. Mueller
Associate ProfessorSchool of Business and Management
National University

From: Tobler, Lorie <toblerl@byui.edu>
Sent: Tuesday, December 2, 2014 3:16 PM
To: Jeffrey Mueller
Subject: 2012 Article-Seeking authorization to use your Confidential Peer Ratings Rubric in my Experimental Research Project

Hi Dr. Mueller,

My name is Lorie Tobler and I am a doctoral student and have been researching e-teams (with my dissertation titled, Experimental Research on Perceived Contributions in e-Teams). Your article, The Fundamentals and Fun of Electronic Teamwork for Students and their Instructors, will be cited in my work. I am hoping to receive permission to use your Confidential Peer Ratings Rubric in my study (with the study taking place next year, 2015).

I have looked at your references and Googled 360 Assessments and believe 360 Assessments is a broad term which many companies use (but I have been unable to see exactly what the companies offer or their data for reliability and validity…it seems they are only interested in quoting a price). Since you do not cite another source for your rubric in your article, I am assuming you are the creator of the rubric.

Would I be able to use your rubric as part of my Qualtrics survey? I am attaching my entire survey to aid in your decision. You will see the numerical value is not shown but is attached behind the scenes. I am asking the same questions 3 ways (to prove reliability and validity), and one of the ways could be with your rubric. My subjects will be at a private, mid-sized university in Idaho. The subjects are future elementary and early childhood/special education teachers.

Thank you for considering my request, and have a nice day!

Lorie Tobler
Teacher Education
Brigham Young University-Idaho
208-496-4121

APPENDIX J

Needs Assessment

Experimental Research on Perceived Contributions in e-Teams		
***What information* is needed?**	***Who/What/Where* are the *sources* for the information**	***How* will the information be *evaluated*?**
Content Information:		
Literacy II (Ed 345)	Instructor/researcher completes the course syllabus before the semester begins and one day to establish interrater reliability and provide training on using technology. Then schedules after the first two weeks of class to have four scheduled class times replaced with the sessions using the content required by the state of Idaho.	University and State requirements will be followed for the course content to be learned in the sessions.
ID Project Intent	Instructor determines the description of intended setting, participants, length of instruction and learning goals.	ID Project Intent completed-curriculum designing that will be used for the specific lesson plan (next step).
Training module	Instructor create a detailed lesson plan (Gagne's Nine Instructional Events) based on the learners' profiles, with measurable objectives, materials needed, anticipatory set (prior knowledge linked), modeling, guided practice and independent work (Vygotsky's scaffolding).	Completed lesson plan.
PowerPoint of Training module	PowerPoint created by instructor will be shown during the beginning of the third week of class (1 hour face-to-face class time).	PowerPoint completed.
Four Project Session Activities	Instructor uses required state curriculum to develop projects activities to be completed during each of the four e-team sessions.	Completed assignment emailed to teacher by one team member.
Qualtrics Survey	Instructor develops survey to gather demographic data, as well as embedding	Survey completed and revised after

	the *360 Peer Contributions Rubric*, to administer and collect data.	two semesters of piloting.
Learner Information:		
Learner Resources (computer requirements)	Learner will be given the specifications for laptops (audio and visual capabilities) and as required through BYU Idaho's Laptop Initiative. The headsets will be provided through a grant, all subjects will have the same headsets. All subjects will have a gmail address.	Subjects will complete roll sheet.
Learner System Requirements (essential computer skills)	Subjects will demonstrate knowledge of *Google Hangout* during a face-to-face class, before the first e-team session. Students will receive an email with the link to each sessions Qualtrics survey.	Subjects will use link from email to complete the survey, immediately following e-team session.
Learner Profile	The demographics of the subjects will be collected through the Qualtrics survey. The instructor will also provide valuable data regarding the demographics.	1) Survey. 2) Instructor knowledge.
Training module	Subjects will hear and see the rubric and scenarios during a face-to-face class. Some disequilibrium may be experienced but subjects should be able to assimilate information to existing schema. Scaffolding (Vygotsky) will be used throughout the PowerPoint and lesson (Gagne).	The rubric will be learned by using Lev Vygotsky's Learning Model and Gagne's Nine Instructional Events.
Context Information:		
Normative Needs	Using state standards for curriculum, the Instructional Designer will effectively teach the subjects writing, fluency, vocabulary and comprehension knowledge that must be known to pass the state tests.	Obtain the State of Idaho Standards for Preservice teachers.
Comparative Needs	The curriculum is a cumulative effort on the part of all universities in Idaho, to determine what knowledge a Preschool-	ICLA committee

	8th grade and special education teacher must have.	determined the curriculum.
Anticipated or Future Needs	The survey may be easily generalized for other content areas.	Survey

Project Summary:

OBJECTIVES-Through a training module, interrater reliability and technology skills will be taught. After four online e-team sessions, the subjects will be able to learn and complete four projects, and complete Qualtrics surveys based on perceived peer contributions.

The subjects are adult, undergraduate students that will use audio and video to communicate during each session. They will construct their knowledge through listening and seeing and working in an e-team of our members. Through guided practice online, and independently completing the project assignments, the subjects will learn required content.

Prior/existing knowledge of using their personal laptop is needed. State standards have been used in the e-team sessions.

The *Needs Analysis* has greater depth than the *ID Intent* and the *Learner Profile;* both are foundational to this analysis and have not been changed but have been added to while development progresses.

APPENDIX K

SPSS Data Analysis

SPSS Data Analysis

Command codes for questions 1-3.

```
Title 'Question 1:'.
Title 'Team Members Scores'.
UNIANOVA AverageTeamMembers BY Condition SessionNumber ID
  /RANDOM=ID
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /PLOT=PROFILE(Condition*SessionNumber SessionNumber*Condition)
  /PRINT=HOMOGENEITY
  /PLOT=RESIDUALS
  /CRITERIA=ALPHA(0.05)
  /DESIGN=Condition ID(Condition) SessionNumber Condition*SessionNumber.
USE ALL.
FILTER BY FirstInGroupFilter.
EXECUTE.

Title 'Question 2:'.
Title 'Project Scores'.
UNIANOVA ProjectScore BY Condition SessionNumber ID
  /RANDOM=ID
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /PLOT=PROFILE(Condition*SessionNumber SessionNumber*Condition)
  /PRINT=HOMOGENEITY
  /PLOT=RESIDUALS
  /CRITERIA=ALPHA(0.05)
  /DESIGN=Condition ID(Condition) SessionNumber Condition*SessionNumber.
USE ALL.
EXECUTE.
Comment
COMPUTE ProjectScoreJittered=ProjectScore+RV.UNIFORM(-.45/2,.45/2).
Comment
EXECUTE.
Comment
COMPUTE
MeanPeerScoreForGroupJittered=MeanPeerScoreForGroup+RV.UNIFORM(-.045/2,.04
5/2).
Comment
EXECUTE.
Comment
COMPUTE
AverageTeamMembersJittered=AverageTeamMembers+RV.UNIFORM(-.045*2,.045*2)
.
Comment
```

```
EXECUTE.

Title 'Question 3 (Individual):'.
GRAPH
  /SCATTERPLOT(BIVAR)=AverageTeamMembersJittered WITH ProjectScoreJittered
BY SessionNumber
  /MISSING=LISTWISE.
CORRELATIONS
  /VARIABLES=ProjectScore AverageTeamMembers
  /PRINT=TWOTAIL NOSIG
  /MISSING=PAIRWISE.

Title 'Question 3 (Averaged):'.
GRAPH
  /SCATTERPLOT(BIVAR)=MeanPeerScoreForGroupJittered WITH
ProjectScoreJittered BY SessionNumber
  /MISSING=LISTWISE.
CORRELATIONS
  /VARIABLES=ProjectScore MeanPeerScoreForGroup
  /PRINT=TWOTAIL NOSIG
  /MISSING=PAIRWISE.
```

Research Question 1

The first question researched, is there a significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly measured by the e-Team Survey, among undergraduate literacy students at a private, western university?

H_0: There is no significant difference in the mean perceived peer contributions scores between stable e-teams and fluid e-teams, as repeatedly measured by the e-Team Survey, among undergraduate literacy students at a private, western university.

Team Members Scores

```
UNIANOVA AverageTeamMembers BY Condition SessionNumber ID
/RANDOM=ID
/METHOD=SSTYPE(3)
/INTERCEPT=INCLUDE
/PLOT=PROFILE(Condition*SessionNumber SessionNumber*Condition)
/PRINT=HOMOGENEITY
/PLOT=RESIDUALS
/CRITERIA=ALPHA(0.05)
```

```
/DESIGN=Condition ID(Condition) SessionNumber Condition*SessionNumber.
```

Univariate Analysis of Variance

```
[DataSet1] C:\Users\craigaj\Desktop\MyFiles\Consulting\Lorie
Tobler\Lorie Tob
ler Data-12Aug2015.sav
```

Between-Subjects Factors

		Value Label	N
Condition	0	Stable	121
	1	Fluid	191
Session	1		78
	2		78
	3		78
	4		78
ID	10F10		4
	10F19		3
	10F25		4
	10F9		4
	10S14		4
	10S15		4
	10S16		4
	10S4		4
	11F10		4
	11F19		4
	11F27		4
	11F6		4
	12F1		4
	12F19		4
	12F3		4
	12F9		4
	1F1		4

Between-Subjects Factors

	Value Label	N
1F13		4
1F2		4
1F5		4
1N11		4
1N26		3
1N27		4
2F17		4
2F21		4
2F22		4
2F24		4
2N16		4

2N30		3
2S16		4
2S20		4
2S4		4
2S7		2
3F12		4
3F14		4
3F15		4
3F3		4
3N25		1
3S18		3
3S23		4
3S6		4
3S8		4
4F14		4
4F17		4
4F29		4
4F7		4
4S15		4
4S18		2
4S2		4
4S20		4
5F21		4
5F23		4
5F24		4
5F8		4

Between-Subjects Factors

	Value Label	N
6F12		4
6F22		3
6F28		4
6F3		4
6S1		4
6S13		4
6S25		4
6S26		4
7F11		3
7F12		4
7F24		4
7F6		3
7S11		4
7S4		4
7S5		4

7S9		4
8F21		4
8F23		4
8F5		4
8F7		4
9F10		4
9F18		4
9F20		4
9F8		4
9S13		4
9S17		2
9S2		4
9S22		4

Team Members Scores

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Peer Perceieved Scores

F	df1	df2	Sig.
.	311	0	.

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Condition + ID(Condition) + SessionNumber + Condition * SessionNumber

Tests of Between-Subjects Effects

Dependent Variable: Peer Perceieved Scores

Source		Type III Sum of Squares	df	Mean Square	F
Intercept	Hypothesis	3800.714	1	3800.714	7526.481
	Error	41.555	82.290	.505[a]	
Condition	Hypothesis	.469	1	.469	.928
	Error	41.555	82.287	.505[b]	
ID(Condition)	Hypothesis	41.622	80	.520	3.157
	Error	36.921	224	.165[c]	
SessionNumber	Hypothesis	2.094	3	.698	4.234
	Error	36.921	224	.165[c]	
Condition * SessionNumber	Hypothesis	1.940	3	.647	3.923
	Error	36.921	224	.165[c]	

Tests of Between-Subjects Effects

Dependent Variable: Peer Perceieved Scores

Source		Sig.
Intercept	Hypothesis	.000
	Error	
Condition	Hypothesis	.338
	Error	
ID(Condition)	Hypothesis	.000
	Error	
SessionNumber	Hypothesis	.006
	Error	
Condition * SessionNumber	Hypothesis	.009
	Error	

Team Members Scores

a. .957 MS(ID(Condition)) + .043 MS(Error)

b. .957 MS(ID(Condition)) + .043 MS(Error)

c. MS(Error)

Expected Mean Squares[a,b]

Source	Variance Component		
	Var(ID (Condition))	Var(Error)	Quadratic Term
Intercept	3.636	1.000	Intercept, Condition, SessionNumber, Condition * SessionNumber
Condition	3.637	1.000	Condition, Condition * SessionNumber
ID(Condition)	3.800	1.000	
SessionNumber	.000	1.000	SessionNumber, Condition * SessionNumber
Condition * SessionNumber	.000	1.000	Condition * SessionNumber
Error	.000	1.000	

a. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell.

b. Expected Mean Squares are based on the Type III Sums of Squares.

sts of Between-Subjects Effects

Dependent Variable: AverageTeamMembers

Source		Type III Sum of Squares	df	Mean Square	F
Intercept	Hypothesis	3800.714	1	3800.714	7526.481
	Error	41.555	82.290	.505[a]	
Condition	Hypothesis	.469	1	.469	.928
	Error	41.555	82.287	.505[b]	
ID(Condition)	Hypothesis	41.622	80	.520	3.157
	Error	36.921	224	.165[c]	
SessionNumber	Hypothesis	2.094	3	.698	4.234
	Error	36.921	224	.165[c]	
Condition * SessionNumber	Hypothesis	1.940	3	.647	3.923
	Error	36.921	224	.165[c]	

a. .957 MS(ID(Condition)) + .043 MS(Error)

b. .957 MS(ID(Condition)) + .043 MS(Error)

c. MS(Error)

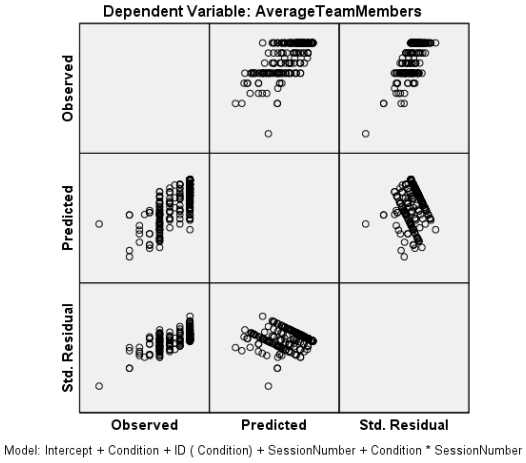
Expected Mean Squares[a,b]

Source	Variance Component		
	Var(ID(Condition))	Var(Error)	Quadratic Term

Intercept	3.636	1.000	Intercept, Condition, SessionNumber, Condition * SessionNumber
Condition	3.637	1.000	Condition, Condition * SessionNumber
ID(Condition)	3.800	1.000	
SessionNumber	.000	1.000	SessionNumber, Condition * SessionNumber
Condition * SessionNumber	.000	1.000	Condition * SessionNumber
Error	.000	1.000	

a. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell.

b. Expected Mean Squares are based on the Type III Sums of Squares.



Research Question 2

The second question researched, is there a significant difference in the performance scores between stable e-teams and fluid e-teams, as repeatedly measured by the graded team projects, among undergraduate literacy students at a private, western university? .....

Levene's Test of Equality of Error Variances[a]

Dependent Variable: ProjectScore

F	df1	df2	Sig.
.	312	0	.

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Condition + ID(Condition) + SessionNumber + Condition * SessionNumber

Tests of Between-Subjects Effects

Dependent Variable: ProjectScore

Source		Type III Sum of Squares	df	Mean Square	F
Intercept	Hypothesis	48196.552	1	48196.552	19499.401
	Error	208.698	84.435	2.472[a]	
Condition	Hypothesis	.043	1	.043	.017
	Error	208.663	84.419	2.472[b]	
ID(Condition)	Hypothesis	199.449	80	2.493	1.324
	Error	423.673	225	1.883[c]	

SessionNumber	Hypothesis	371.952	3	123.984	65.844
	Error	423.673	225	1.883[c]	
Condition * SessionNumber	Hypothesis	2.030	3	.677	.359
	Error	423.673	225	1.883[c]	

a. .965 MS(ID(Condition)) + .035 MS(Error)

b. .965 MS(ID(Condition)) + .035 MS(Error)

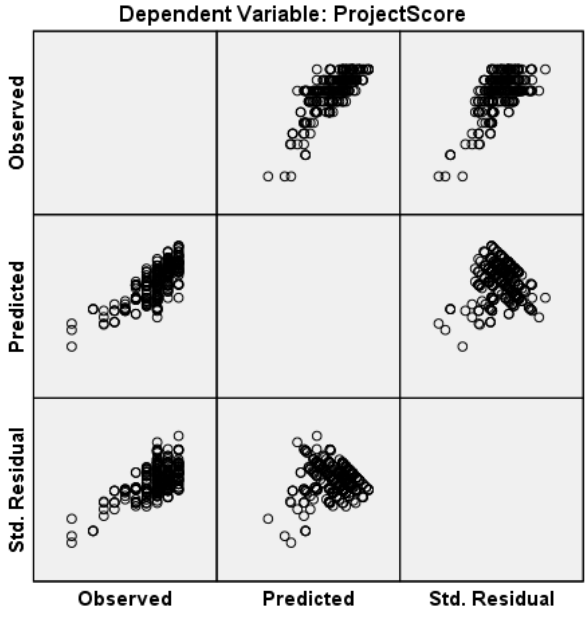
c. MS(Error)

Expected Mean Squares[a,b]

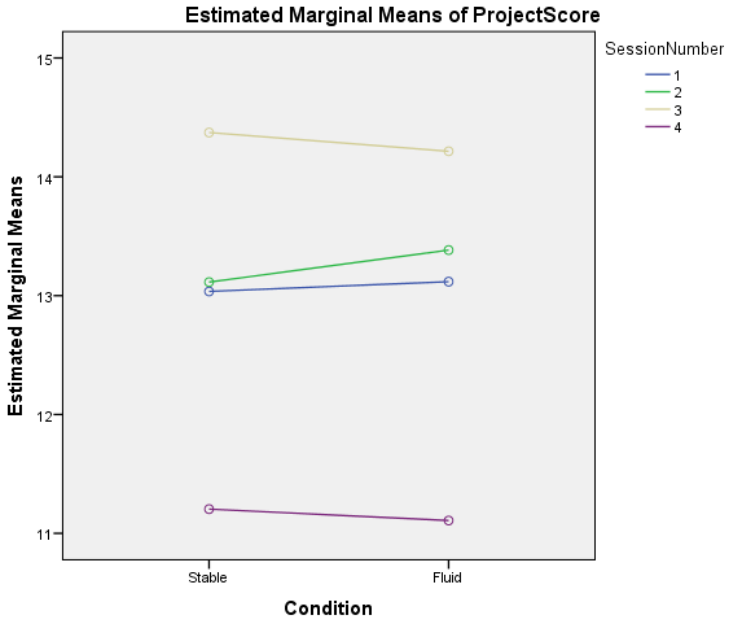
Source	Variance Component		
	Var(ID(Condition))	Var(Error)	Quadratic Term
Intercept	3.679	1.000	Intercept, Condition, SessionNumber, Condition * SessionNumber
Condition	3.679	1.000	Condition, Condition * SessionNumber
ID(Condition)	3.813	1.000	
SessionNumber	.000	1.000	SessionNumber, Condition * SessionNumber
Condition * SessionNumber	.000	1.000	Condition * SessionNumber
Error	.000	1.000	

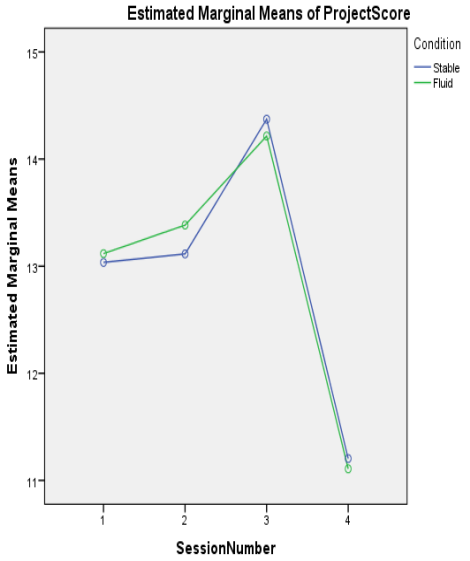
a. For each source, the expected mean square equals the sum of the coefficients in the cells times the variance components, plus a quadratic term involving effects in the Quadratic Term cell.

b. Expected Mean Squares are based on the Type III Sums of Squares.



Model: Intercept + Condition + ID (Condition) + SessionNumber + Condition * SessionNumber





Research Question 3

The third question researched, is there a correlation between the teams' mean perceived contributions scores and corresponding projects scores of stable and fluid e-teams, as repeatedly measured by the team projects and the e-Team Survey, among undergraduate students at a western university?

Correlations

		ProjectScore	AverageTeamMembers
ProjectScore	Pearson Correlation	1	.137*
	Sig. (2-tailed)		.016
	N	313	312
AverageTeamMembers	Pearson Correlation	.137*	1
	Sig. (2-tailed)	.016	
	N	312	312

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations

		Project Score	Peer Perceived Team Averages
Project Score	Pearson Correlation	1	.259*
	Sig. (2-tailed)		.020
	N	313	81
Peer Perceived Team Averages	Pearson Correlation	.259*	1
	Sig. (2-tailed)	.020	
	N	81	81

*. Correlation is significant at the 0.05 level (2-tailed).

Research Question 4

The fourth question asked and researched, is there a decrease in the proportion of low ratings of perceived contributions over time (four synchronous sessions) for either stable e-teams or fluid e-teams?

Statistics

		1Teammember	2TeamMember	3TeamMember	4TeamMember
N	Valid	89	86	87	83
	Missing	33	36	35	39

1Teammember

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	.8	1.1	1.1
	3	4	3.3	4.5	5.6
	4	10	8.2	11.2	16.9
	5	74	60.7	83.1	100.0
	Total	89	73.0	100.0	
Missing	System	33	27.0		
Total		122	100.0		

2TeamMember

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	.8	1.2	1.2
	2	6	4.9	7.0	8.1
	3	3	2.5	3.5	11.6
	4	13	10.7	15.1	26.7
	5	63	51.6	73.3	100.0
	Total	86	70.5	100.0	
Missing	System	36	29.5		
Total		122	100.0		

3TeamMember

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	.8	1.1	1.1
	4	14	11.5	16.1	17.2
	5	72	59.0	82.8	100.0
	Total	87	71.3	100.0	
Missing	System	35	28.7		
Total		122	100.0		

4TeamMember

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	.8	1.2	1.2
	3	1	.8	1.2	2.4
	4	19	15.6	22.9	25.3
	5	62	50.8	74.7	100.0
	Total	83	68.0	100.0	
Missing	System	39	32.0		
Total		122	100.0		

Fluid

Statistics

		1Teammember	2TeamMember	3TeamMember	4TeamMember
N	Valid	142	139	136	142
	Missing	49	52	55	49

1Teammember

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	1.6	2.1	2.1
	2	2	1.0	1.4	3.5
	3	5	2.6	3.5	7.0
	4	31	16.2	21.8	28.9
	5	101	52.9	71.1	100.0
	Total	142	74.3	100.0	
Missing	System	49	25.7		
Total		191	100.0		

1Teammember

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	1.6	2.1	2.1
	2	2	1.0	1.4	3.5
	3	5	2.6	3.5	7.0
	4	31	16.2	21.8	28.9
	5	101	52.9	71.1	100.0
	Total	142	74.3	100.0	
Missing	System	49	25.7		
Total		191	100.0		

2TeamMember

		Frequency	Percent	Valid Percent	Cumulative Percent
	2	2	1.0	1.4	1.4
	3	3	1.6	2.2	3.6
Valid	4	39	20.4	28.1	31.7
	5	95	49.7	68.3	100.0
	Total	139	72.8	100.0	
Missing	System	52	27.2		
Total		191	100.0		

3TeamMember

		Frequency	Percent	Valid Percent	Cumulative Percent
	2	1	.5	.7	.7
	3	6	3.1	4.4	5.1
Valid	4	23	12.0	16.9	22.1
	5	106	55.5	77.9	100.0
	Total	136	71.2	100.0	
Missing	System	55	28.8		
Total		191	100.0		

4TeamMember

		Frequency	Percent	Valid Percent	Cumulative Percent
	1	1	.5	.7	.7
	3	7	3.7	4.9	5.6
Valid	4	37	19.4	26.1	31.7
	5	97	50.8	68.3	100.0
	Total	142	74.3	100.0	
Missing	System	49	25.7		
Total		191	100.0		

APPENDIX L

Subjects' Comments from the e-Team Survey

Subjects' Typed Comments

The comments typed by the subject's on the last question of the e-Team Survey are shown in tables. If a subject noted that a team member was absent, that was not included in the tables. The tables are organized by sessions (four sessions). The subjects' comments have been edited for spelling and conventions, and names' of team members were taken out. The tableshows the comments and designates if the comment was positive (+) or negative (-).

Session 1 Subjects' Comments from the e-Team Survey

Condition	+ or -	Comments
Fluid	+ & -	It went well! However my lap top went from 100% charged to 19% by the time I was done and my battery is a pretty good battery. I wasn't expecting that. Google Hangouts EATS up the battery life. I will bring my charger next time for sure.
Fluid	-	My computer was very slow for most of the time, I had to switch computers so that I could actually work without my computer freezing up due to the internet connection.
Stable	-	[Team member] had problems with the internet, that's why she didn't participate that much but I know she would've been a great help!
Stable	-	We were not able to completely finish the assignment because we did not know how to use some features of the program.
Fluid	+ & -	We were not able to get our table formatted correctly but we have the information therefore I said we would get full credit. We also worked together really well as a team.
Stable	+	They were awesome and worked hard and well together! I enjoyed it!
Stable	+	This was fun!

Stable	+ & -	Not sure who exactly submitted the project. It was very frustrating doing this because there was a lot of background noise and not everyone was communicating about what they were doing but they were all contributing and working on the project.
Fluid	-	I had some connection/technology failure issues twice at the beginning of our project. It was frustrating because I had to catch up with what everyone else in my group was doing. It may have come across as me not fully participating but it was a technology issue.
Fluid	+ & -	We worked really hard but had a lot of technical difficulties. We worked for a good 20 minutes on Step 3 but could not get the boxes or text boxes to work, or delete, or anything. Member C also kept getting kicked off and was not able to help as much because of that, however, when member c was on, member c was very helpful and did a lot! I hope that we will get full credit, because if we just had a few more minutes to figure out the problem with the text boxes we would have finished everything. I hope that will be considered. =]
Stable	-	One member of our group never got her computer working so she was unable to participate.
Fluid	-	We needed like 2 more minutes because we had connection issues. We were close, but just barely short.
Fluid	-	The only problem is that my computer is really slow.
Fluid	+ & -	We were able to complete the whole assignment, however none of us could figure out how to add lines to our Concept map and the TA couldn't help us. That was frustrating, but besides that, everything else worked.
Stable	-	I lost internet 30 seconds before we finish[ed] the assignment.
Fluid	+ & -	We were rushed at the end and we worked together pretty effectively so I think more time is required when working in an online format as opposed to being in person.
Stable	+	Nothing. Everything went well!

Fluid	-	I had A LOT of computer problems so I did not get to do much.
Fluid	+	This was fun!
Fluid	-	I had a hard time getting into the video hangout.
Fluid	-	We had no idea how to create a concept map so we were all confused on that.
Stable	+	It went well! I like my group!
Fluid	+ & -	Technology is really frustrating, but my group was good to work with.
Fluid	+	I want to keep this group they are awesome.
Fluid	-	We couldn't figure out how to draw lines on google docs.
Fluid	-	Our google doc failed and person C kept loosing connection.
Stable	-	Connectivity made it hard to get everyone involved.
Fluid	-	I am unsure if I would choose to work with group member D again.
Stable	-	My computer did not work out for this assignment, so I wasn't able to fully participate. The video wouldn't work after we started, and then the Google Doc wouldn't allow me to work on it either.
Stable	-	Group member A's computer was not working. The lack of participation on her part was not her fault and she continuously made efforts to fix the problem.
Fluid	+	We worked well together!
Fluid	+	We were able to work well together.
Stable	+	I loved this!
Fluid	-	Me and team member A did all of the work, the other two kind of sat and had very little to say or do.
Stable	-	Group member B had technical problems the whole time.
Stable	-	Group member B had a lot of difficul7ty with technology so she had minimal participation in the project.
Stable	-	Participant B didn't have a microphone that worked and missed the time of "preparation" before we began working on the project.
Fluid	-	It was hard for four people to actively

		participate in such a simple task. It was also hard to know who was expected to do what.
Fluid	-	Difficult to know which you are following when you have it in 4 different classes 5 minutes left for one isn't 5 minutes for all).
Stable	-	Team member B, myself, was having technical issues the whole time and that is why I was not able to participate much.

A total of 40 subjects entered comments on the last question on the e-Team Survey after session 1. Of those 40 comments, there were 31 negative subjects' comments, with all but two of the negative comments in reference to technology and connectivity issues. A total of 17 positive comments were reported from session 1's e-Team Survey.

After session 2, the table shows 21 comments were entered for the last e-Team Survey question. Of the 21 comments, 11 fluid team members commented and 10 stable team members. All of the negative comments were in reference to technology issues.

Session 2 Subjects' Comments from the e-Team Survey

Condition	+ or -	Comments
Fluid	+ & -	Today went well! I remembered to bring charger. The sound crossfire is a little CRAZY though. I wish there was a way we could minimize some of the background noise.
Stable	+	Everyone did a great job contributing! I would definitely work with all of them again.
Fluid	+	Nope. All went well today!
Fluid	+ & -	My computer had problems again. I don't

		think it likes google hangouts. But we quickly got a recovery computer and I was able to help my team.
Fluid	+	This time, as opposed to session 1, the project took less time.
Stable	+	We worked a lot harder this time. This time we used strategies to help us stay on track and finish our project on time.
Stable	-	Student B was having technical difficulties.
Stable	-	Today was frustrating. My computer wouldn't work, they gave me another school computer, after a while it stopped working and finally after they gave me a third computer I was able to help.
Stable	+	Everything went well today!
Stable	+	Everyone participated and worked together well in our group!
Fluid	-	Technology makes this so tricky every single time!
Stable	+	My group was amazing again but even more efficient because we had worked together before.
Fluid	+	I liked my team today. We were all able to meet on Google Hangout without any complications.
Fluid	-	My microphone wasn't working for the first half of the meeting. The tech person helped me fix it for the second half.
Stable	+	It went well!
Stable	+ & -	It went really well today! My computer actually worked. [Team member] had a hard time getting into our video call at first, but it finally started working. I really enjoyed our topics and activities.
Fluid	+	Loved my group.
Fluid	-	Member A was extremely controlling/wanted to run it herself.
Fluid	-	Team member A went on to doing a step without us and was not communicating with us. She also had a lot of computer trouble so it was hard to communicate with her.
Stable	+	Worked well.
Fluid	+ & -	Besides the technical glitches today went great!

Session 4 Subjects' Comments from the e-Team Survey

Condition	+ or -	Comments
Fluid	-	Can be difficult dividing the work on Google Docs/makes everything slower.
Stable	+	We did a great job!

Interestingly, not one comment was made after session 3. A total of two comments were made at the end of session 4 on the e-Team Survey, as shown in table. The one positive comment referred to teamwork, and the negative comment was in connection to using Google Docs and teamwork.

Summary

The purpose of this research was to study how team membership stability affects student learning and perceived peer contributions. Question one delved into how team membership affects perceived peer contributions. Subjects completed a brief survey after each session. The data was used in a repeated measures ANOVA and concluded there is no significant difference between the condition alone, whether the e-team is fluid or stable. There is a significant interaction with stable and fluid e-teams and the averaged perceived peer scores interact within the different sessions, meaning over time (sessions) the stable e-teams averaged higher perceived peer scores over the different sessions, concluding stable e-team members received higher perceived peer scores between team members that have worked together over the sessions. Working together over time

caused stable e-team members to score their perceived peer' contributions better.

Question two probed the effect of team membership on student learning. The project scores received from the four projects were not significantly different between the stable and fluid e-teams. Team membership did not significantly affect student learning based on the four project scores. There was a slight increase in scores for the first two sessions for fluid e-teams and then the stable e-teams slightly scored higher over the last two sessions.

Questions three addressed the relationship between student learning and perceived contributions. There was a strong correlation between the perceived peer scores and the project scores. If team members received high perceived peer scores, their project usually received a high score (as blind-scored by the researcher), and vice versa.

Question four looked at the occurrence of free-riders and social loafers in fluid and stable e-team to see if one was more prone to have either plague their e-teams. Over time, the students working in fluid and stable e-teams did not consistently decrease with social loafers and free-riders. Free-riders only showed up in the two types of teams during one session. The number of social loafers would increase and decrease between the different sessions.

The comments given on the e-Team Survey provided qualitative data. The researcher analyzed each comment as to whether the comment was positive or negative. The number of negative and positive

comments drastically reduced to zero by the third session. The technology issues were noted as the most frequently occurring negative comment during the first two sessions, subjects experienced minimal or no technology glitches during the third and fourth sessions.