

# **Leadership Development of Technology Students through Experiential Learning**

Submitted in partial fulfillment of the requirements for the degree of

Master of Science  
in  
Software Management

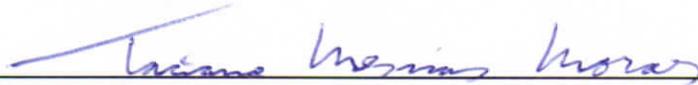
Taciano M. Moraes

B.S., Computer Science, Goias Federal University - Brazil

Carnegie Mellon University – Silicon Valley  
Mountain View, CA

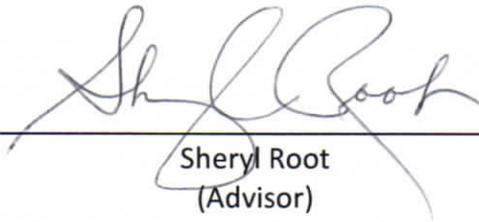
December, 2015

# Teaching Leadership to Technology Students through Experiential Learning



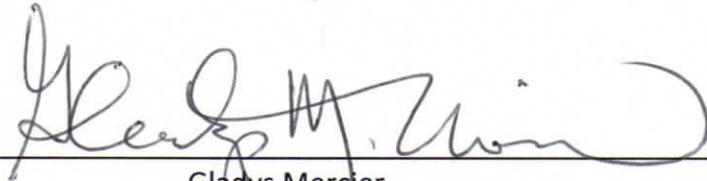
---

Taciano Moraes  
(Author)



---

Sheryl Root  
(Advisor)



---

Gladys Mercier  
(Director)

Date: 9 / 12 / 2015

A thesis submitted to the Integrated Innovation Institute, Carnegie Mellon University for  
the degree of Master of Science in Software Management

# Dedication

---

To all the leaders,

Who are wise enough to use their power only with kindness

Who speak more by their actions than by their words

Who are seeking the truth instead of greatness

Who trust their intuition as much as their reasoning

Who inspire unity rather than segregation

Who embrace uncertainty and freedom without losing control or responsibility

Who still say what is right even with the voice quivering

Who dare to change what everyone is already used to

Who help their followers realize they can also be leaders

Who look their inside as much as their outside

Who are bold enough to make the right decisions even when harming themselves

Who are teaching more than commanding

And most importantly,

To the ones that have taught them how to be leaders.

# Acknowledgments

---

Firstly I would like to thank my advisor, Sheryl Root. Without her previous course and support on this study, my dream of researching about leadership would have been indefinitely postponed.

I want to thank the Brazilian government, CAPES and CNPq for making this work possible and for sponsoring thousands of Brazilians like me to enhance our knowledge and have the indescribable experience of living abroad.

I thank Chance, God, Yahweh, Allah, Brahma, Kami, Guan Yu, Krishna, Jahbulon, Guaraci or any other names in whatever belief, for aligning all the coincidences needed for this master's to happen.

Thanks to my friends and in special Roberto (a.k.a. Maumas) who tirelessly inspired me to pursue and to believe that I was worthy of this scholarship.

Finally and utmost, I would like to thank my family and beloved fiancée for the unconditional encouragement and endless love during all this time apart.

# Abstract

---

In a world where technology is changing every single detail of our societies, schools, and organizations in a skyrocketing speed, it is worrying that the way we develop our leaders is improving so slowly. With numerous studies showing that leadership is one of the factors that impact the most on software projects' success, it is worrying that more than \$14B are spent yearly with leadership development and, still, most organizations believe they are not being effective.

One of the most efficient methodologies for leadership development inside companies is the Experiential Learning from David Kolb, but it still has some problems in gaining traction inside universities due to their difficulty of simulating practical experiences. Many different approaches have been tried with various results and little standardization is perceived on the way they are used.

For this reason, this study proposes a framework for using group activities as a means to help technology students practice leadership skills. A first pilot was executed with pleasant results and feedback from students, but more experiments are necessary to ensure its application for other skills and contexts.

**Keywords:** Leadership Development, Experiential Learning, Group Activities, Technology Leaders, Software Management.

# Table of Contents

---

<b>1. Introduction</b>	<b>10</b>
1.1. Motivation	13
1.2. Objective	16
1.3. Methodology	17
1.4. Scope	18
<b>2. Leadership</b>	<b>20</b>
2.1. Technology Leaders	24
<b>3. Teaching Leadership</b>	<b>28</b>
3.1. A brief historic overview	28
3.2. Leadership Learning	30
<b>4. Group Activities</b>	<b>34</b>
4.1. Analyzing the Group Activity	37
<b>5. Experiential Learning Theory</b>	<b>40</b>
5.1. The value of ELT for teaching leadership	44
<b>6. Literature Review</b>	<b>48</b>
6.1. Directly related studies	49
6.2. Indirectly related studies	51
<b>7. Results</b>	<b>56</b>
7.1. Group Experiment	56
7.2. Students evaluation of the activity	59

<b>8. Discussion .....</b>	<b>64</b>
8.1. Classroom Evaluation .....	66
8.2. ELT Framework for Leadership Group Activities .....	68
<b>9. Conclusion .....</b>	<b>72</b>
9.1. Limitations .....	73
9.2. Future Work.....	73
<b>10. References .....</b>	<b>76</b>
<b>11. Appendices .....</b>	<b>84</b>
11.1. Appendix A: List of Activities .....	84
11.2. Appendix B: Results of the Literature Review .....	93
11.3. Appendix C: Release Form .....	94
11.4. Appendix D: Activity Evaluation Form .....	96
11.5. Appendix E: Adapted Activity Evaluation Form .....	97
<b>12. About the Authors .....</b>	<b>100</b>

# List of Tables

---

Table 1 - Competence areas and personal characteristics .....	22
Table 2 - Five Most Important Leadership Competencies.....	26
Table 3 - Build a Pyramid activity overview .....	57
Table 4 - Execution plan for the "Build the pyramid" activity .....	58

## List of Figures

---

Figure 1 - Software projects resolution results. Data extracted from.....	11
Figure 2 – Failure rate of the criteria for delivered projects .....	12
Figure 3 - Leadership Urgency vs. Readiness.....	14
Figure 4 – The performance gap between importance and efficiency .....	15
Figure 5 - Primal Leadership Styles .....	23
Figure 6 – Comparison of priorities of business problems to be solved .....	24
Figure 7 – Comparison between competences importance .....	25
Figure 8 - Six Mirrors of the Classroom .....	37
Figure 9 - Kolb's Experiential Learning Theory. Design by Alan Chapman. ....	41
Figure 10 – Experiential Learning Styles comparison among fields .....	42
Figure 11 - Important elements in the learning process of the leaders of tomorrow .....	44
Figure 12 - Combination of keywords for the secondary research .....	48
Figure 13 - ELT model combined with activity itinerary .....	58
Figure 14 - "Build the pyramid" activity evaluation.....	60
Figure 15 - Evaluation of the Six Mirrors of the Classroom .....	67
Figure 16 - Model of framework to use ELT for leadership group activities .....	69

*"If you want to build a ship, don't drum up the men to gather wood, divide the work, and give orders. Instead, teach them to yearn for the vast and endless sea."*

*Antoine de  
Saint-Exupery*

# 1. Introduction

---

For many decades researchers and managers from all over the world have been trying to unveil the mystery behind the huge number of software projects that fail to meet schedule, budget, user satisfaction, quality, or even fail completely, being cancelled before delivering anything. One of the first and most successful on addressing this inherent complexity of software was Frederick Brooks, with his book later being considered “The Bible of Software Engineering” and introducing, possibly, the most breaking through and at the same time ignored axiom by leaders on the field:

*“Adding manpower to a late software project makes it later”* [1, pp. 25]

Later in an article, equally successful and eye-opening for software managers, he divided the difficulties of software development in essential (e.g. conception, validation, and management issues) and accidental (e.g. codifying, testing, and deploying issues), and criticized that most efforts are still devoted to the latter, unlikely to generate major improvements in productivity [2].

In the same epoch, the acclaimed book Peopleware shared a similar insight that the major problems of software projects were not technical but rather human. It also presented the alarming statistic that from 500 projects surveyed from 1977 to 1987, the failure rate was of 15%. For large projects it was even worst, 25% of them never

completed, and most of the failure causes were somehow related to leadership: communication problems, disenchantment with the boss, lack of motivation, and high turnover [3].

Another study done in 1994 was even more drastic declaring that software development projects were “in complete chaos”, with only 16% of the them completing on-time and on-budget, 52% costing almost the double, and 31% being cancelled before the end [4]. The chart on Figure 1 exhibits a compilation of all the available chaos reports, allowing a clear visualization of the evolution of the successes and failures of software projects.

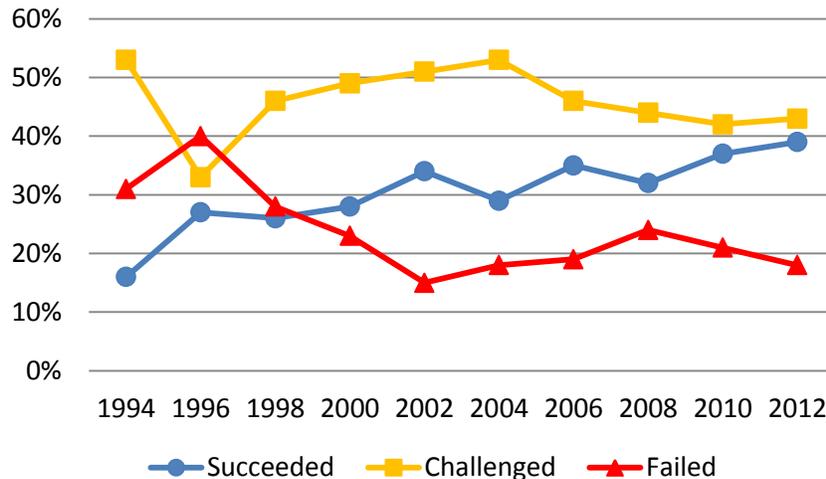


Figure 1 - Software projects resolution results. Data extracted from [5], [6].

Although these reports were further questioned by a few researchers [7] - [9] regarding their undisclosed methodology, lack of peer review and misconceptions about the definition of failure, the only one that tried to replicate the survey also found not so different numbers. This study [9] also arrived on similar results about failing to meet success criteria (showed on Figure 2) and the most common reasons for project cancellation were again related to the teams’ leadership: senior management not sufficiently involved (33%), too many requirements and scope changes (33%), and lack of necessary management skills (28%).

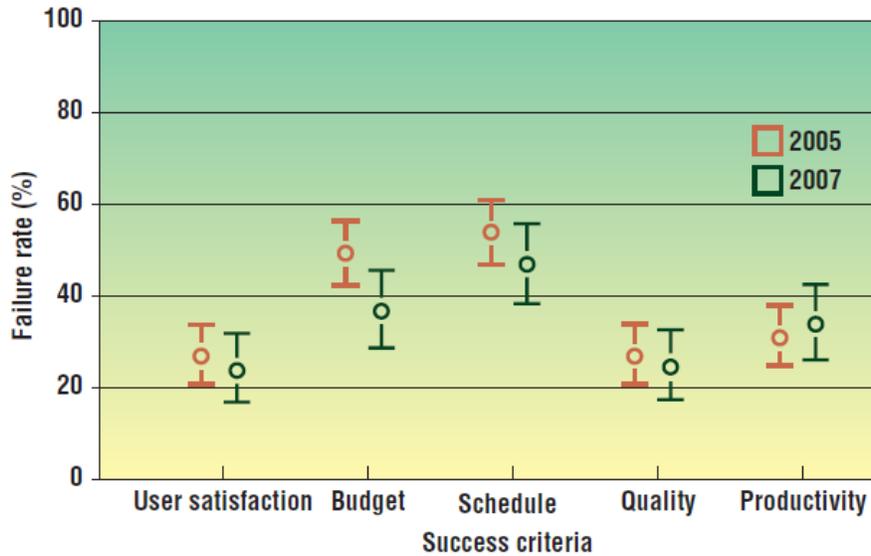


Figure 2 – Failure rate of the criteria for delivered projects [9].

By using again the two categories introduced by Brooks, it is reasonable to observe that all the success criteria mentioned on the graph above are related to the essential aspects of software development and directly impacted by the project leadership. Other studies have presented similar findings, showing that users' involvement, project management, planning, and communication are among the factors that have the largest influence on reducing the risks of time and cost overrun [10]. Failures are resulted from innumerable and intricately related causes and lack of cooperation is one of the main connections among these causes [11]. Clarity on project mission and support of top management are also amid the most critical success factors across the project lifecycle [12] and similar findings were got from agile projects [13].

The trend on Figure 1 shows that projects failure rate has declined over the last decades, probably due to the adoption of agile methodologies, continuous integration, and TDD, that minimized the accidental difficulties in software development. Nevertheless, the rate is still somewhere between worrying and absurd, precisely because the essential difficulties are the most impactful and complicated to deal with. But as Brooks said, one day the accidental difficulties will be mostly solved and then the

industry will have to undertake the essential ones that it has been neglecting for a long time [2].

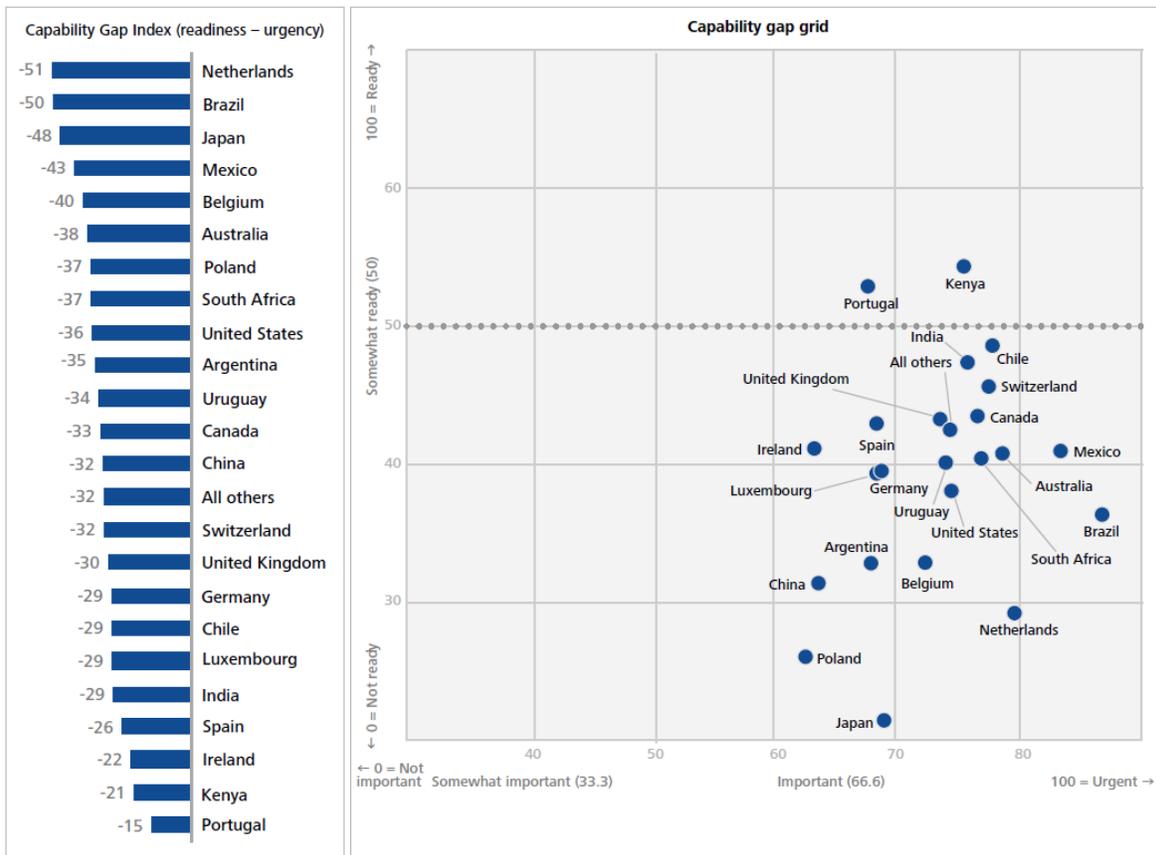
This work considers leadership as a powerful means to tackle these essential difficulties of software development, which is also supported by a number of extensive studies that have shown that appropriate leadership not only decrease the risk of project failure but also significantly improve teamwork and staff productivity [14] - [20]. Therefore, improving the way technology universities are teaching leadership today for the ones that will be software managers in the future, is a promising long-term endeavor to help the success rate on Figure 1 increase significantly more. And maybe finally surpass the number of failed and challenged projects together.

## 1.1. Motivation

The idea for this study began to germinate in a course about Leadership taken by the author and taught by the advisor in the spring semester of 2015. At the end of that course, they engaged in a conversation on how the tech market is facing an immense deficit of great leaders, about the 70/20/10 rule for leadership development [21], and on how students could exercise in practice at least a few of the leadership skills studied. A few months later, this study sprouted from this conversation, in which both were interested on developing the idea further on so that in the future they could use practical activities in their leadership teachings.

Besides the personal motivation, the world itself has shown an increasing concern on leadership shortage as one of the biggest obstacles to growth. A global survey done by Deloitte shows that 86% of companies consider leadership not only as their highest-priority issue but also the one with the largest gap to be fulfilled [22]. Interesting enough, this same survey shows that both countries of the author (Brazil) and the advisor (United States) present a low readiness and high urgency in addressing

the leadership problem, and only two countries are somewhat ready, as depicted on Figure 3 below.

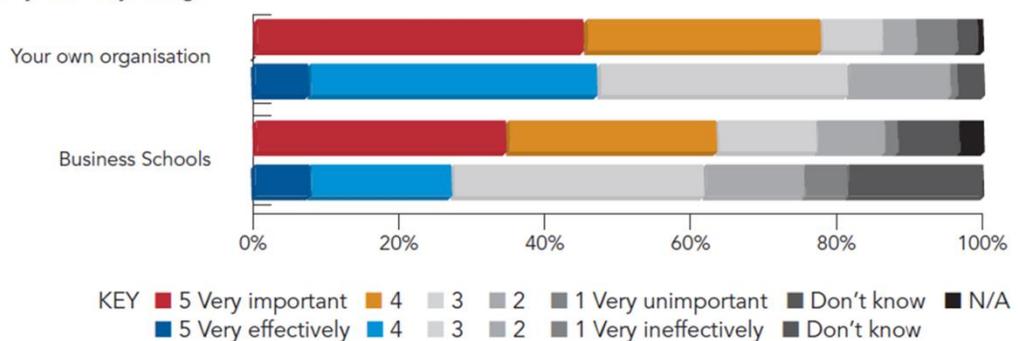


**Figure 3 - Leadership Urgency vs. Readiness [22].**

Combined with the inevitable digitalization of most markets, the cumulative complexity of software systems, and the globalization of teams, tech organizations are also facing new leadership challenges in the 21st century. Besides having to develop and integrate different generations of leaders, these are also facing increasing demands of flexibility, innovation, inspiration, and knowledge in rapidly changing technologies. The complexity of this context explains one of the aspects of why almost US\$14 billion is spent yearly on leadership development only in US itself and increasing around 14% year-over-year [23].

The other aspect is that the ways these professionals are developing their leadership skills are not being effective enough for all the before mentioned challenges. In spite of all this investment, a study by Bersin shows that almost 75% of leadership teams still fail to achieve business goals [24]. The graph on Figure 4 presents visually the vast performance gap of these investments: the predominant majority (76%) of senior managers thinks that it is important for their own organizations to develop leadership but at the same time more than half of them (52%) think their organizations are not doing it effectively [25]. The skepticism about the importance and the effectiveness of business schools is even more marked: 62% against 28%.

How important is it that the following organisations develop these skills and knowledge over the next five years, and how effectively are they currently doing so?



**Figure 4 – The performance gap between importance and efficiency [25].**

Another extensive research done in 195 countries by Gallup shows very alarming numbers: that only 13% of the employees are engaged at work, that disengagement drains almost U\$1 trillion worldwide per year, and that managers are ones responsible for 70% of their engagement [26]. A survey about job satisfaction by the Conference Board has registered a big decline among US workers, from 61.1% in 1987 to 47.7% in 2013 [27], while other two studies have pointed how job satisfaction is impacted by leadership [28], [29], which could attenuate this 21st century organizational crisis and even revert into positive results.

The Ken Blanchard Companies estimate that superior leadership can reduce almost 9% in turnover rates and 5% to 10% in the productivity loss faced by companies [30]. Moreover, this same article argues that better leadership practices could generate around 4% improvement in customer satisfaction, what reflects as 1.5% increase in revenue growth. For this reason, it is imperative that both companies and universities assess and improve their ways of developing and teaching leadership. This study, however, will focus on the former.

## 1.2. Objective

Initially, the purpose of this study was to study how practical activities about leadership are being used in universities and compile a list of the most useful ones for technology students. After some weeks of research and discussions about how these activities could be used in a structured way, it was concluded that the Experiential Learning Theory from David Kolb could be a good framework to achieve the practical approach of this study and that it could even allow it to get deeper and better focused. Therefore, the purpose was set as the following:

*To study how Kolb's Experiential Learning Theory could be used to give technology students more practical experience on leadership courses taught in graduate schools.*

### **Research questions:**

- How are professors teaching leadership in technology universities?
- What group activities are they using?
- How to use the Experiential Learning Theory to teach leadership?

These were the three main questions that this study sought to answer, although many other derivative questions about learning theories, leadership education, technology leaders, and kinds of activities were also addressed throughout the work.

### 1.3. Methodology

In the beginning, a secondary research was done in order to better understand how professors are currently teaching leadership in universities and if they are using any kinds of practical activities to enhance students' learning. After the Experiential Learning Theory was adopted, a literature review was done to gather knowledge around this subject. And with the intention of accurately defining each of the related topics for this study, another few consults were done about: leadership theories, technology leaders, leadership education, leadership group activities, and interaction analysis.

The two main sources for the desk research were CMU Library<sup>1</sup> and Google Scholar<sup>2</sup>, once they essentially crawl most of the journals, academic databases, and online libraries. However, a few quick searches were also done in Google, specially relating to the activities. For this study, only the results integrally available for CMU ID were considered and the queries were assembled by combining the following keywords:

- i. "Leadership", "Leaders"
- ii. "Experiential Learning", "Kolb", "Learning Style Inventory"
- iii. "Software", "Technology", "Computing", "Information Systems"
- iv. "Teaching Leadership", "Developing Leadership", "Leadership Learning"
- v. "Group Activities", "Team Activities", "Practical Activities"

Additionally to the before mentioned sources, the following leadership journals were also consulted and explored in order to assess how current researchers are addressing similar or related research questions:

- International Journal of Leadership in Education
- The Journal of Leadership Education
- Open Journal of Leadership
- Journal of Leadership Studies
- The Leadership Quarterly

---

<sup>1</sup> <http://library.cmu.edu/>

<sup>2</sup> <http://scholar.google.com/>

Once the initial literature review was finished, a list of leadership group activities was compiled and one of them was selected to be implemented using the Experiential Learning framework. A few details of the activity were slightly redesigned and modified to match the new structure, but in general the idea of the activity remained the same.

Following an Observational Methodology, the selected group activity was executed with a small number of students (N=12) and entirely recorded on video, in order to allow a comprehensive Interaction Analysis (i.e. not only dialogs, but also gestures, usage of the provided materials, and body language) among the students and how the leadership process actually occurred and changed over time.

After the execution of the pilot, all the findings and results about the use of this framework were collected and discussed. A list of similar activities that could be executed using the same framework was compiled (available on Appendix A) in order to allow this approach to be experimented and validated in the future by more researchers and professors, and also in larger groups of students.

## 1.4. Scope

Contrary to most of MBA students that usually work during their programs, already occupying management and executive positions, [31] and can apply what they learn with leadership courses in real life scenarios (on their day-to-day jobs), technology students can't do alike and frequently struggle to implement what they learn in their professional or even their personal lives.

Because graduate students are mostly full-time and have zero or little leadership experience, they have limited and more difficult occasions to apply the leadership concepts they learn (e.g. personal life, school work with other students). Therefore, they will be the main focus of this study, which could be a significant opportunity to create value for a niche with an enormous need.

*"The greatest leader is not necessarily the one who does the greatest things. He is the one that gets the people to do the greatest things."*

*Ronald Reagan*

## 2. Leadership

---

On the inception of modern leadership research when war heroes were most of the examples of successful leaders, dating back in the beginning of the 19th century, the predominant theory was that leadership traits were a gift that you either born with or not. First disseminated by Thomas Carlyle, the Great Man Theory stated that the merit of these men was such that “the history of what man has accomplished in this world, is at bottom the History of the Great Men who have worked here” [32].

But still in his contemporaneity, the theory faced strong criticism as sociology and positivism were starting to gain traction with the works of Comte, Marx, Weber, and Durkheim. The biggest objector of this theory was the also famous Herbert Spencer, that argued that the idea was completely non-scientific, archaic, and naïve, and questioned:

“But if all biological science, enforcing all popular belief, convinces you that by no possibility will an Aristotle come from a father and mother with facial angles of fifty degrees, and that out of a tribe of cannibals, whose chorus in preparation for a feast of human flesh is a kind of rhythmical roaring, there is not the remotest chance of a Beethoven arising; then you must admit that the genesis of a great man depends on the long series of complex influences which has produced the race in which he appears, and the social state into which that race has slowly grown.... Before he can remake his society, his society must make him.” [33]

In the end of the 19th century, William James also challenged the Great Man Theory by comparing the influence of the environment on an individual in becoming a leader, of being as strong as the influence of a genetic variation on the natural selection of a species:

“The causes of production of great men lie in a sphere wholly inaccessible to the social philosopher. He must simply accept geniuses as data, just as Darwin accepts his spontaneous variations. For him, as for Darwin, the only problem is, these data being given, How does the environment affect them, and how do they affect the environment? Now, I affirm that the relation of the visible environment to the great man is in the main exactly what it is to the "variation" in the Darwinian philosophy. It chiefly adopts or rejects, preserves or destroys, in short selects him. And whenever it adopts and preserves the great man, it becomes modified by his influence in an entirely original and peculiar way. He acts as a ferment, and changes its constitution, just as the advent of a new zoological species changes the faunal and floral equilibrium of the region in which it appears.” [34]

With the advancement of the industrial revolution and beginning of the 20th century, the Great Man Theory was completely discarded and replaced by a much more complex combination of traits, environmental and sociological factors, timely opportunities, and the capacity of the leader on being proactive and efficient on the execution. This resulted in an upsurge of leadership theories, particularly after the 1930s, with the most popular being:

- Trait Theory
- Behavioral Theory
- Contingency Theory
- Transactional Theory
- Transformational Theory
- Servant Theory
- Situational Theory

Currently, there is a prevalent trend of discouraging the use of a single theory, shifting to adopt many competence areas and personal characteristics depending on the

organizational context, the situation, and the group to be led [35]. Besides, leadership has unquestionably no relation with roles and can also happen informally, which means that a same group can have different leaders depending on the context.

One proposal of most essential competences and personal traits are shown in Table 1 below, but it is important to highlight that there is no consensus regarding these aspects, each study has its own combination of different characteristics [37], [38], [39], what reinforces the idea that they should be chosen according to the context.

Competence areas	Personal characteristics
<ul style="list-style-type: none"> <li>▪ <b>Envision</b> – the ability to identify a clear future picture, which will inform the way in which people direct their efforts and utilize their skills.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Authenticity</b> – being genuine and not attempting to “play a role”; not acting in manipulative way.</li> </ul>
<ul style="list-style-type: none"> <li>▪ <b>Engage</b> – finding the appropriate way for each individual to understand the vision and, hence, the way in which they can contribute.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Integrity</b> – being consistent in what you say and do.</li> </ul>
<ul style="list-style-type: none"> <li>▪ <b>Enable</b> – acting on a belief in the talent and potential of individuals, and creating the environment in which these can be released.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Will</b> – a drive to lead, and persistence in working towards a goal.</li> </ul>
<ul style="list-style-type: none"> <li>▪ <b>Inquire</b> – being open to real dialogue with those involved in the organization and encouraging free and frank debate of all issues.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Self-belief</b> – a realistic evaluation of your capabilities and belief that you can achieve required goals.</li> </ul>
<ul style="list-style-type: none"> <li>▪ <b>Develop</b> – working with people to build their capability and help them to make the envisioned contribution.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Self-awareness</b> – a realistic understanding of “who you are”; how you feel and how others see you.</li> </ul>

**Table 1 - Competence areas and personal characteristics [36]**

Daniel Goleman, Richard Boyatzis, and Annie McKee have managed to categorize these personal traits in six different leadership styles, also arguing that leaders should have a good repertory of ways to leading people in hand and that each style should be applied in different situations and to result in different impacts [40]. A brief summary of these styles and their particularities is portrayed on Figure 5 below:

LEADERSHIP STYLE	HOW IT BUILDS RESONANCE	IMPACT ON CLIMATE	WHEN APPROPRIATE
VISIONARY (OR AUTHORITATIVE)	MOVES PEOPLE TOWARD SHARED DREAMS	MOST STRONGLY POSITIVE	WHEN CHANGE REQUIRES A NEW VISION, OR WHEN A CLEAR DIRECTION IS NEEDED
COACHING	CONNECTS WHAT A PERSON WANTS WITH THE TEAM'S GOALS	HIGHLY POSITIVE	TO HELP A PERSON CONTRIBUTE MORE EFFECTIVELY TO THE TEAM
AFFILIATIVE	VALUES PEOPLE'S INPUT AND GETS COMMITMENT THROUGH PARTICIPATION	POSITIVE	TO HEAL RIFTS IN A TEAM, MOTIVATE DURING SUCCESSFUL TIMES, OR STRENGTHEN CONNECTIONS
DEMOCRATIC	VALUES PEOPLE'S INPUT AND GETS COMMITMENT THROUGH PARTICIPATION	POSITIVE	TO BUILD BUY IN OR CONSENSUS, OR TO GET VALUABLE INPUT FROM TEAM MEMBERS
PACESETTING	SETS CHALLENGING AND EXCITING GOALS	OFTEN HIGHLY NEGATIVE BECAUSE POORLY EXECUTED	TO GET HIGH QUALITY RESULTS FROM A MOTIVATED AND COMPETENT TEAM
COMMANDING (OR COERCIVE)	SOOTHES FEARS BY GIVING CLEAR DIRECTION IN AN EMERGENCY	OFTEN HIGHLY NEGATIVE BECAUSE MISUSED	IN CRISIS, TO KICK START A TURNAROUND

Figure 5 - Primal Leadership Styles [40].

A few studies have debated on the impact of gender in leadership, discussing how difficult it is for women to relate with an image that is historically constructed as masculine or even to adopt alternative styles appropriate for female leadership, which is just as challenging [41]. However, it was found that even with this difficulty the effectiveness of both male and female leaders were equal, although both are more effective than the other when in roles more related to masculine or feminine terms [42].

Because of the lack of unanimity and the enormous complexity of dealing with these competencies and personal characteristics, this study has focused its approach on

leadership skills, which are more tangible and defined; especially the ones technology students might have a more serious deficiency.

## 2.1. Technology Leaders

In order to identify the best set of leadership skills to focus on this work, first it was necessary to study how technical professionals differ from management professionals. Understanding these differences can certainly have an impact on how to efficiently prepare these technology students to become successful leaders.

Firstly, it's important to understand how these two groups prioritize business problems, which is depicted on Figure 6 below. It's interesting to notice that technical professionals and researchers (T/R) are biased to think that a 'Technical Breakthrough' is the most important problem and should be solved first, while managers and leaders (M/L) think that 'Teambuilding' is the one with the highest priority.

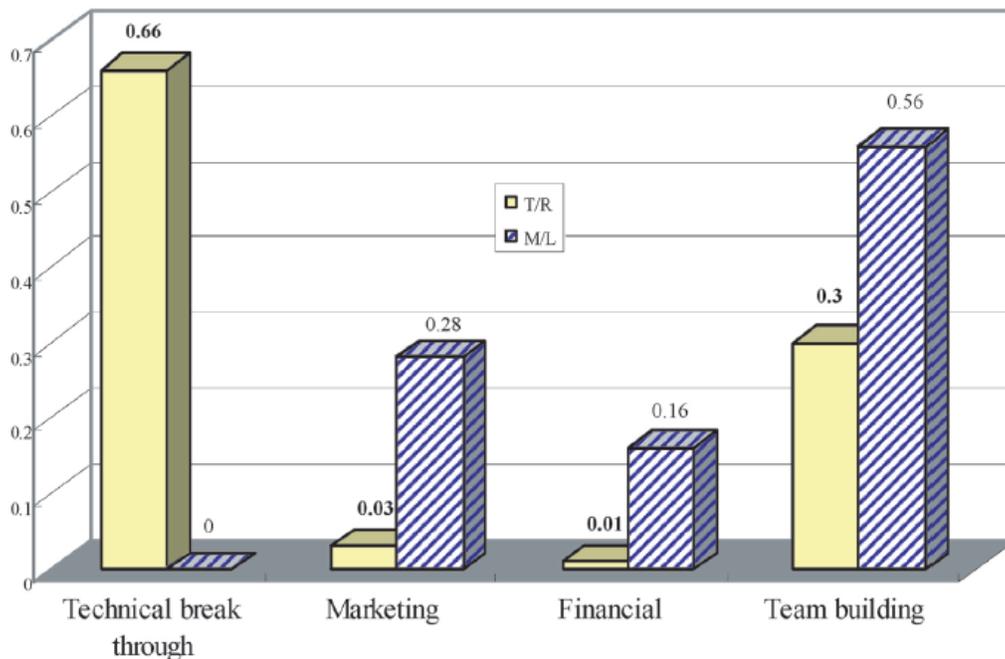


Figure 6 – Comparison of priorities of business problems to be solved [43]

Similarly, the next chart on Figure 7 compares how these two groups perceive the importance of a given set of competencies. Again, we see that technical professionals and researchers are biased against the importance of ‘Technical Competence’, choosing it as the first, while choosing ‘Leadership’ as the last. Besides ‘Active Learning’ and ‘Ability to Change Habits’, all the other competences were significantly more important for managers than for technical professionals.

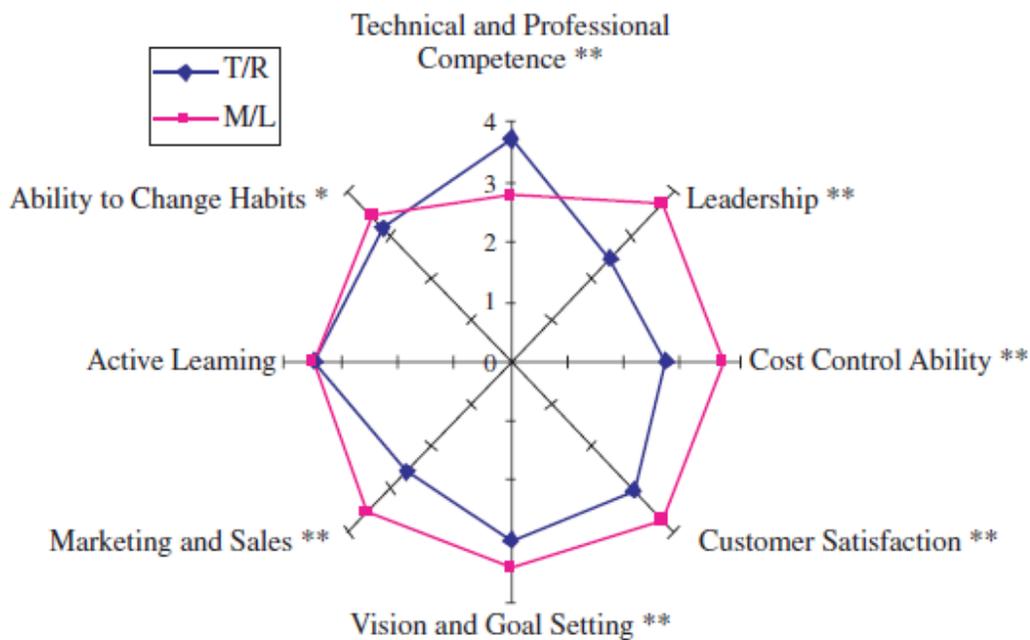


Figure 7 – Comparison between competences importance [43]

Based on these differences it is easier to establish a list of skills that technology professionals should be practicing more often in order to become better leaders. However, no extensive study about leadership skills for technology students was found. That's why the following list of the ten most important leadership skills for software managers was actually defined based the frequency that those skills appeared on other articles [44] – [47] and excluding the ones such as ‘Problem Solving’ or others that technology students already exercise throughout their programs:

- Effective Communication
- Emotional Intelligence
- Active Listening
- Confidence
- Inspire Others
- Delegating
- Conflict Resolution
- Strategic Vision
- Flexibility
- Teamwork

Evidently that these skills should not be considered as definitive, for mainly two reasons: the first is that they were not validated or cautiously selected by any relevant study; and the second is that even if they were, they also change with the years.

A survey from the Creative Center for Leadership done with almost 500 managers from all over the world has shown how the perception about leadership competencies has evolved for the last 20 years, as depicted on Table 2:

20 YEARS AGO	TODAY	10 YEARS FROM NOW
53% Technical Mastery	44% Self-motivation/Discipline	29% Adaptability/Versatility
46% Self-motivation /Discipline	40% Effective Communication	26% Effective Communication
32% Confidence	29% Learning Agility	24% Learning Agility
31% Effective Communication	26% Self-awareness	22% Multi-cultural Awareness
20% Resourcefulness	22% Adaptability/Versatility	20% Self-motivation/Discipline
		20% Collaboration

**Table 2 - Five Most Important Leadership Competencies [48].**

As a result, it is crucial that the skills used on this work be not only validated but also revalidated with time, as leadership priorities are changing with the world. To also explain a little more on how leadership education has evolved with time, the next section will have a brief overview about its history.

*"The mediocre teacher tells. The good teacher explains. The superior teacher demonstrates. The great teacher inspires."*

*William Arthur Ward*

## 3. Teaching Leadership

---

### 3.1. A brief historic overview

Leadership education is probably one of the most studied and debated fields from ancient times to contemporary days, once leaders have played a big role in shaping our history. Since its first signs, as private classes for boys of royal families in Egypt [49], it has played a crucial role in building the leaders that shaped our history. In the western world, it started to reach a bigger public in the 5th century BCE with the sophists in Greece, who were professional teachers paid by wealthy men to offer education in aretē (virtue or excellence) for their young adult sons to become leader politicians or militaries [50].

Greek education reached its apex in the 4th century BCE with the Platonic Academy, considered the world's first university, where Plato and his followers employed a method of teaching based on lectures, seminars, and dialogues [51]. Shortly after, Aristotle branched out this educational project with the Lyceum and at this time revolutionized the school system by gathering knowledge and generating scientific research [52].

Simultaneously and thanks to the Greek influence, the schools were starting to proliferate in the Roman Republic but still far from having the same importance [53]. Roma's most successful leadership educator (i.e. oratory for future senators), Quintilian, pointed that education in Rome was mostly done by the pater familias (father of the family) and not as much developed as in Greece [54].

After the expansion of the Roman Empire, schools significantly lost value, once the invading Germanic tribes had no formal education. And with the collapse of the empire and beginning of the "Dark Ages", the western education system nearly reverted to a primitive level [55]. This leads us to believe that leadership education also sank together (being again restricted to royal boys) and only resurged again almost a millennium later on the Italian Renaissance.

During the Middle Ages, education was confined to the monasteries of the Roman Catholic Church, focusing mostly in forming clerks (although also teaching some other disciplines). Gradually they began to incorporate more and more knowledge fields and evolved to the first western universities around the beginning of the 10th century [56]. In the beginning of the Renaissance, along with the diminishing power of the Catholic Church and ascending power of the aristocracy, the interest about rhetoric and politics started to grow once again [57].

With the Protestant Reformation, the focus started to switch from a religious focus to a political one, particularly with the culmination of the French Revolution and the ascension of the Bourgeoisie to the power. Despite this, the educational of leadership aspect kept mostly frozen during this time.

The shift to business leadership happened shortly after, with the Industrial Revolution and the rise of Capitalism, resulting in the current state of leadership teaching, where the focus is mostly on developing better managers and executives.

## 3.2. Leadership Learning

As discussed on the previous section, historically, political leaders used to be trained since kids (i.e. sons of emperors, kings, and other powerful rulers) to replace their fathers. Currently, technology leaders are not trained for more than a few years, which again explains the terrifying software project failure rates exposed on Figure 1.

On the other hand, a survey by the Center for Creative Leadership with executives from many countries has showed that 97% of them believe that leadership development should start before the age of 21 and that they would have been immensely benefited if they have had this early experience themselves [48].

Complementing this reasoning, Figure 11 on Section 5.1 depicts how leadership development programs should be highly focused on practice. For many years, leadership courses on technology universities have focused on technical and theoretical training, rather than on practical and soft skills. Instead of students being taught how to lead, they used to be taught about the many theoretical models about leadership.

Due to this inefficiency on developing future leaders, companies have started to assume this responsibility, investing billions of dollars in leadership training programs exactly trying to supplement the lack of good leaders. Nevertheless, as exhibited on Figure 4, both companies and universities still need effective and innovative ways to teach leadership.

It was considering this problem that, almost 30 years ago, Morgan McCall, Marshall Lombardo, and Ann Morrison shaped the 70/20/10 rule, which says that “70 percent of leadership development consists of on-the-job learning, supported by 20 percent coaching and mentoring, and 10 percent of courses and readings” [58].

Many Fortune 100 companies have already embraced this model to improve their executive development programs [59], but excepting by Princeton, where the model was developed, Berkley and a few others, not many universities are trying to implement

it. This can be also be related with the difficulty of simulating the “on-the-job” experience in the academia context, which will be explored on the next section.

Despite the relative success in the leadership development industry, a few authors have criticized this model, arguing that the model lacks support of empirical evidence [60], that it is inconsistent with organizational investments, and that it allows the leadership development process to have little evaluation and accountability [61].

However, it is evident that the 70/20/10 rule was created to serve simply as a model to inspire more practice connected with the learned knowledge. Specifically in academia, it’s practically impossible to implement leadership courses with the same ratio. But even that far from this proportion, the need for more practical and effective ways of teaching leadership (and also how much the students learned) is incontestable.

Studies have presented that simulations activities have showed to be an effective approach to learning leadership, as well as interesting and stimulating for the students [62]. The next section will discuss on how to adopt group activities with this purpose.



*"Remember teamwork  
begins by building trust.  
And the only way to do  
that is to overcome our  
need for invulnerability."*

*Patrick Lencioni*

## 4. Group Activities

---

It is already well known that traditional classrooms are not being satisfactory on the teaching of leadership, even most teachers and professors are aware of this, but this is even more tangible for the market that has dealt with this inefficiency directly and tried to compensate it through its own expenses. While most students may learn the concepts and models about leadership, they still lack the practical experience to later implement them in their lives. Accordingly, this study has opted to use group activities as a means to increment, diversify, and put to practice the traditional teaching of leadership.

The last 30 years have shown an intense research activity on the implementation of group activities both in the classroom as in the corporative environment. The former, resulted in increase on the students' participation, less interruptions when others speak, a more sophisticated level of discourse, and more valuable contributions to discussions [63]. The latter, has showed to be an important contributor to innovation diffusion inside companies as well as to the business performance and success [64]. Once the central purpose of this work is to improve the leadership skills of technology students, the discussion here will focus on this second context and discuss how to apply group activities to meet this goal.

Numerous studies in the most diverse contexts have been done to make evident the benefits of adopting group activities on teaching. Comparing to a traditional discussion-based approach, a group activity approach shows a significant improvement in almost all the dimensions analyzed (Leader Support, Task Orientation, Self-Discovery, Order and Organization, and Leader Control), [65]. It even discussed on how *“the development of group leadership consists of two parts: practicing the related multifaceted skills and techniques, and mastering the interpersonal processes and dynamics”* and on how the effectiveness of the leader impacts directly the success of the group.

Another study did this same comparison but regarding the teachers’ perspective and found that by only changing the methodology, it significantly transformed the organizational structure of the class and thus impacted the teachers’ behaviors towards students:

“In cooperative classrooms, teachers move among the groups to monitor progress and provide specific assistance. In this role, the teacher is ‘the guide on the side, not the sage on the stage’ and the language used is more caring and personal as they work more closely with small groups. Furthermore, their language is often more spontaneous, varied, and creative as teachers communicate more positive affective messages to their students. This is in contrast to traditional classrooms (i.e. whole-class instruction) where teachers’ language is often regarded as authoritarian, rigid, and critical, where teachers are often perceived as distant or impersonal. In such classrooms, teachers often direct the learning while students are expected to be passive and respond only when required to do so.” [63]

When dealing with group activities, there are a number of factors that might impact the learning outcomes: group size, group duration, task complexity, pre-activity preparation, level of participant interdependence, incorporation of a peer assessment component, group accountability (e.g. a group presentation), and individual accountability (e.g. writing assignment) [66]. These factors should be adapted according

to the context, the instructor, the course, and the students in order to generate better results.

As mentioned earlier group size does affect the outcome of the exercise, but contrary to common belief, group activities can also be incorporated in large classrooms with effective results [67]. Although this would require more preparation on the part of the instructor, they can also be a good strategy to promote engagement in the classroom and to inspire students to have a bigger participation in their learning process.

Rachel Hertz-Lazarowitz developed a comprehensive model to assist teachers and professors in evaluating all the richness and complexity of their classrooms and to renovate them into a more group-oriented and collaborative environment. The model consists of six “mirrors” that reflect and interact with each other, and each of these contains five components of increasing coordination and harmony [68].

Represented on Figure 8 below, her model can contribute to the development of more interactive and cooperative classrooms, by providing a methodical system for assessing its multiple dimensions simultaneously. It served as a guide for this work, after the execution of the experiment, to evaluate how the classroom performed during the Experiential Learning activity. And while this model also allows a long term analysis of the whole course, the next section will consider how to assess each group activity individually.



“Interaction analysis is a recent development in anthropology and qualitative sociology that integrates an ethnographic perspective with finegrained analysis of human interaction. This methodology involves analyzing records of human activity in order to understand how that activity is accomplished through the interactions among the participants and the artifacts in their environment”. [69]

The purpose of this method is to capture human activity in its most raw form, with the least intervention of the researcher (or in this case instructor) as possible, after the start of the task. The students should be allowed to organize themselves and execute the task in the way they prefer, with the observer only capturing the experience to be later analyzed. Because of this, the activities are frequently recorded both video and audio, to ensure not only their discussion be analyzed, but also their body language and use of materials, thus allowing the establishment of common patterns and obstacles when dealing with the task.

Once this was the first and only pilot used for this study, it was allowed a certain level of uncertainty in order to capture the completeness of the activity, as described by Lucille Suchman when studying human-machine interaction:

“The point of departure for the study was the assumption that we lack a description of the structure of situated action. And because the hunch is that the structure lies in a relation between action and its circumstances that we have yet to uncover, we do not want to presuppose what are the relevant conditions, or their relationship to the structure of the action. We need to begin, therefore, at the beginning, with observations that capture as much of the phenomenon, and presuppose as little, as possible”. [70]

During the execution of the group activity, described in details on Section 7.1, it was used the model of “Individual Part”, “Intra-team Discussion”, and “Inter-team Discussion” to improve the efficacy of the experience with the students, regarding not only their learning but also their participation as team members [71].

The next section will discuss about Kolb’s Experiential Learning Theory and how it was adopted as the framework for the group activities.

*"I hear and I forget;  
I see and I remember;  
I do and I understand."*

*Chinese Proverb*

## 5. Experiential Learning Theory

---

Building on the work of innumerable prominent scholars of the twentieth century, such as John Dewey, Kurt Lewin, Jean Piaget, William James, Carl Jung, and Paulo Freire, the Experiential Learning Theory (ELT) is a holistic model that aims to represent the experiential side of the adult learning and development process [72]. The cornerstone of the theory is on the following propositions [73] shared with the previously mentioned thinkers:

1. Learning is a continuous process rather than a simple outcome
2. Learning is incremental, constantly refined by new ideas and beliefs
3. Learning is driven by the resolution of conflicts and differences on mind models
4. Learning is an integrated process of thinking, feeling, perceiving and behaving
5. Learning is resulted from a synergetic process of the person with the environment
6. Learning is a process of knowledge construction rather than simply transmission

Thereby, the ELT model bases itself on the points above to represent the learning process as a construction of knowledge that involves the equilibration of the four major learning modes depicted in black on Figure 9. On green, the Perception Continuum represents the dialectical relationship of feelings and thoughts, used for grasping

experience. On blue, actions and observations form the Processing Continuum by which experience is transformed.

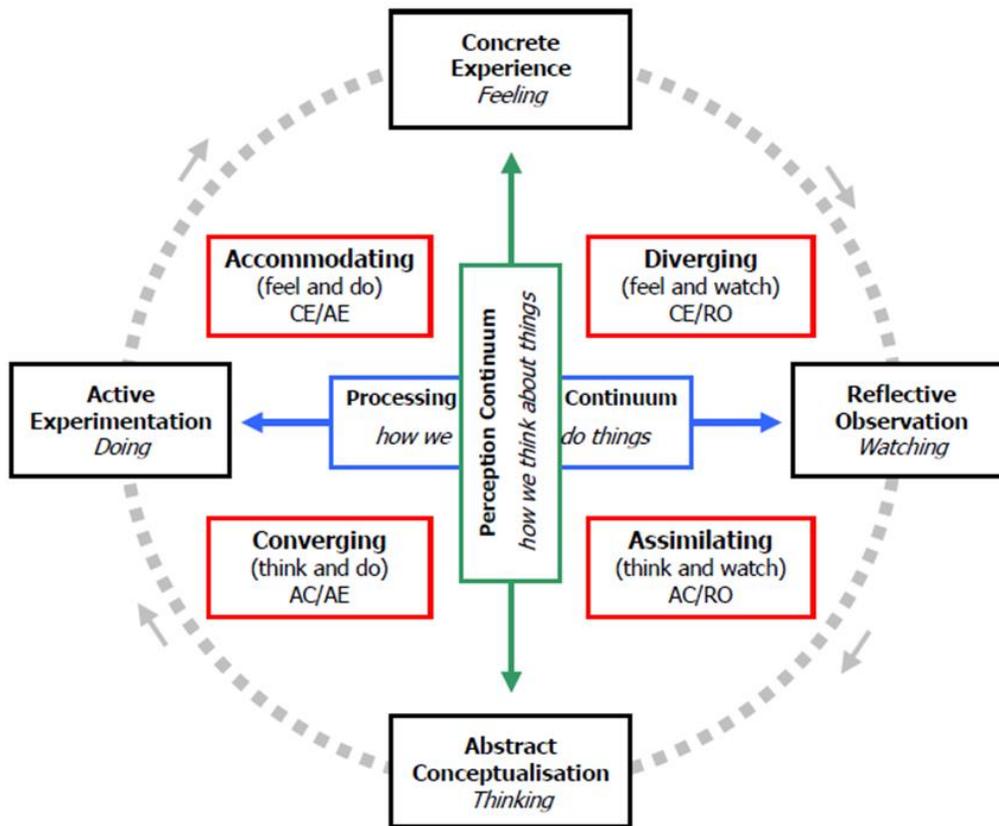


Figure 9 - Kolb's Experiential Learning Theory. Design by Alan Chapman [74].

Evidently, each of these modes and even the idealized cycle itself will vary depending on the learning context, the subject being taught, and both the instructor's and students' style [72]. On red, originated by the combination of the modes with their neighbors, are the four learning styles that compose the Learning Style Inventory (LSI) also developed by Kolb. As shown on red, it categorizes people in four different groups: Accommodators, Divergers, Assimilators, and Convergers. However, in his work there is a clear warning of using these styles only as a tool to increase awareness about how individuals learn, instead of using it as stereotypes to pigeonhole people:

“The LSI is not a criterion-referenced test and is not intended for use to predict behavior for purposes of selection, placement, job assignment, or selective treatment. This includes not using the instrument to assign learners to different educational treatments, a process sometimes referred to as tracking. Such categorizations based on a single test score amount to stereotyping that runs counter to the philosophy of experiential learning, which emphasizes individual uniqueness.” [72, pp. 8]

Comparing these learning styles among different educational fields, it is possible to visualize (on Figure 10) an overview of the results of many different studies and visibly perceive how all these areas still have much in common, but at the same time have their own peculiarities. Technology and business students were deliberately picked to compare their learning styles, while literature and science/math were selected solely to highlight the contrast with the previous ones. This representation confirms popular commonplaces about these domains, such as scientists not using their feelings as regularly as the rest; writers not doing as much as they feel and think; and business people and software engineers being more devoted to thinking and doing, than feeling.

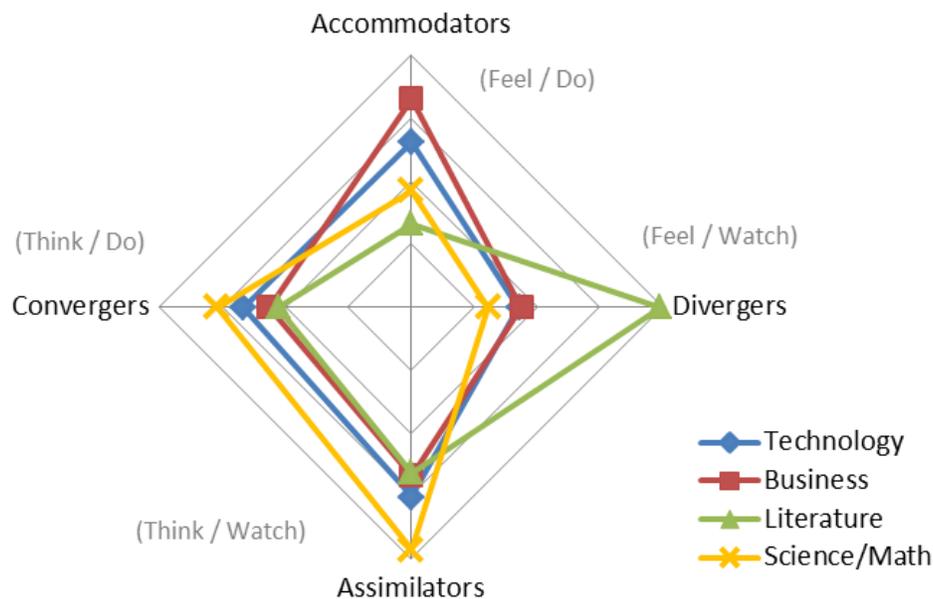


Figure 10 – Experiential Learning Styles comparison among fields. Data extracted from [72]

Unsurprisingly, this is again related to the propositions previously mentioned, in special with the fifth, on how the context also influences the individuals on it as much as the opposite. Due to the preponderant exposition of tasks and activities inside each educational field being related to these specific learning styles, the students inevitably start developing and getting used with the ones they practice the most.

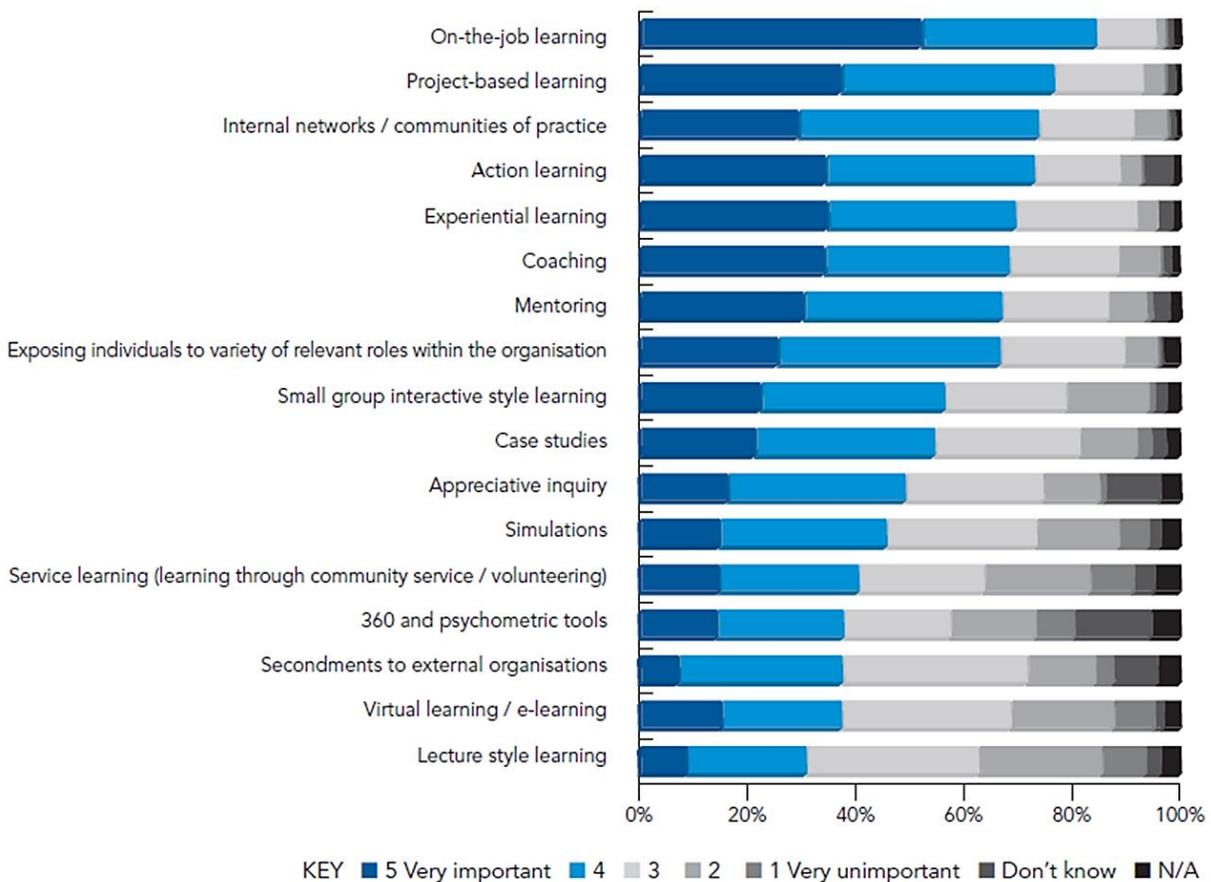
Although the similarity among the learning styles of technology and business students is particularly interesting for this study, it requires further and profounder investigation. Before that, this information could only be used as a sole indicative of the potential of investing in the development of technology leaders, but with no definitive conclusions.

The ELT and the LSI have also been targeted by many critics, both for empirical as for theoretical reasons [74]. Some authors have argued that this theory underestimate the value and complexity of the reflection in the learning process [75]. Also, that the four learning styles model was not exhaustively validated and doesn't include assimilation and memorization [76]. Others have discussed on how the model disregards individuality and numerous other factors that similarly impact on learning, particularly social, psychodynamic, and institutional factors [77] - [79]. But from all the critics mentioned, they all seem to be considering the model as an absolute concept, what is indeed the opposite of its purpose, of being merely a framework to help guiding and enriching the educational experience [80].

Nevertheless, Kolb's work is still considered as one of the most influential learning theories, being explored in all over the world by more than 1500 studies, articles, books, dissertations, and papers, as well as being one of the few models that provides a comprehensive and fully generalized representation of the experiential learning process [74]. Once it was originally published in the management field, and has always had its adoption and interest [72 pp. 18], it is undoubtedly the most appropriate choice to support this work on teaching leadership by practical means.

## 5.1. The value of ELT for teaching leadership

As it will be discussed in deep in the next section, only a few of the studies found were specifically about the use of ELT on the teaching of leadership. This up-surgng academic interest is simultaneously affecting and being affected by the interest of the industry about more practical ways of developing leaders. The diagram on Figure 11 exhibits the evident importance about practical learning, with all the top 5 priorities being related to it.



**Figure 11 - Important elements in the learning process of the leaders of tomorrow [81]**

One of the reasons of the high adoption of Experiential Learning on leadership development is that leadership is something that you don't learn just by theory. It's a

social phenomenon that depends on the context of the person that decides to lead and the group (s)he is situated.

Despite the interest by both the academy and the industry about the practical learning, they still seem to be uncertain on how to appropriately use it on leadership development, specially the former. Several completely different approaches have been tried of implementing the ELT model in leadership development, from using it on outdoor camps to adopting arts and dramaturgy with the students. The next section will discuss the studies found about this and its related subjects.



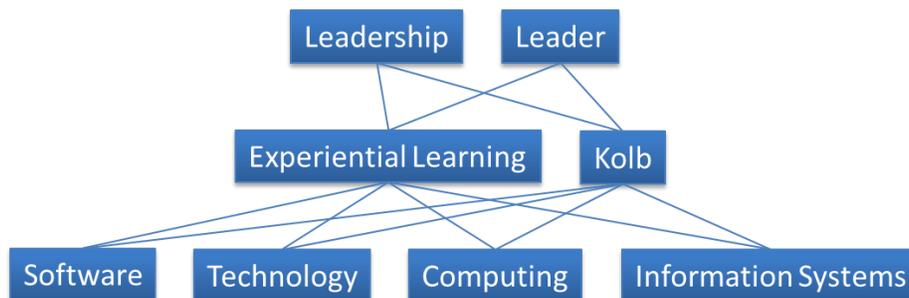
*"In the end, it is  
important to remember  
that we cannot become  
what we need to be by  
remaining what we are."*

*Max De Pree*

## 6. Literature Review

---

The queries were run through September to December of 2015 with the combinations of the keywords mentioned on Section 1.4 and also ad-hoc searches to find related studies used as references in the ones initially found. Basically all the main queries (15 out of 16) combining all the three most important groups of keywords, as showed on Figure 12, returned no results when considering only the title, neither on Google Scholar or CMU Digital Library.



**Figure 12 - Combination of keywords for the secondary research**

The exception was for the search string “Experiential Learning Leadership Software” that returned only two results [82], [83] and the first doesn’t even cite Kolb. Because of this, a second search was run also considering other fields besides the title and returned a colossal number of results (hundreds of thousands), most of them with

little or no relation to the subject of this study. From these, due to the time constraint of this study and the irrelevancy of the latest pages, only the 50 first results of each search string were considered to have their titles and abstracts analyzed, tunneling to a final number of 12 additional results that were moderately relevant. A list of all these results is available on Appendix B.

## 6.1. Directly related studies

From the two directly relevant results obtained, the first one [82] was from two professors from Brigham Young University, both teaching in the Weidman Center for Global Leadership, with exactly the same objective and approach of this study. The only difference is that they are trying to implement the Experiential Learning model from Kolb not only in a single course, but in an even more systematic manner, spanning many leadership labs through the whole program.

In order to implement ELT in their program, they reviewed how a few universities such as MIT, Northeastern, Rice, and Penn State University are already using it in their programs. As a result, they designed an integrated program that develops students using various methods since their start as freshman, to sophomore, junior and finally senior, each stage involving different activities, among them:

- Rapid Fire Leader Experiences
- Understanding Personality Differences
- Problem Solving and Time Management
- Ethics Case Studies
- Individual versus Team Effectiveness
- Understanding the World and Global Issues
- Appreciating and Understanding other Cultures
- Global Case Studies

From the challenges they faced on the program and feedback received from the students, they identified six elements that can help on the implementation of an experiential learning approach:

1. *“Leadership education should be implemented early on in an academic career*
2. *Leadership education should be done in teams*
3. *Active involvement of students allows them to take responsibility for their own learning and the learning of others*
4. *Emphasis should be placed on skill building instead of knowledge acquisition*
5. *Gradually withdraw support, as students are more comfortable*
6. *Debriefing is the most critical part of experiential learning”*

The second study found [83] was done by two faculty members from the Cincinnati College of Applied Science, where they used a mix approach of ELT, community service, and Problem Based Learning (PBL) on the course “Leadership and Teamwork from Within” offered for technology programs. Although they didn’t use or mention Kolb’s model specifically, the course probably fulfilled all the four learning modes (depicted on Figure 9) as they offered a wide range of activities:

- Community service for the Junior Achievement program, serving as consultants for third and fourth grade children
- Two days camp with indoor and outdoor leadership activities
- Leadership seminars with reading assignments and industry guests’ talks
- Problem Based Learning environment, with activities such as coaching a soccer team of thirteen-year old girls and being guest speakers in a monthly meeting of The Young Executive Association

Besides the many challenges of implementing all these activities in a single course, they received widespread positive feedback through a survey they applied to evaluate students’ quantitative and qualitative reactions. As a conclusion, they suggest that this pilot course could be not only introduced in most engineering and technology

curricula but also broken into components to be incorporated in already existing courses, in order to not overload already crowded programs.

## 6.2. Indirectly related studies

The other indirect results (related to two of the keywords categories from Figure 12) also explored innumerous interesting approaches on how to use Experiential Learning. Although a good parcel of them was not specific to technology students or not specific about leadership, it is valuable to also present a brief discussion of the main highlights of them, once they can give other new perspectives to be experimented.

Similarly to the second study discussed on the previous section, that combined experiential learning with community service, three other articles also presented similar approach. One examined two leadership programs from IBM and HSBC that collaborated with non-profit organizations in order to develop the mindsets and skills needed for the leaders of world with an increasingly need for sustainability, finding that the experiential factor was fundamental for the success of their outcomes [84]. The other two discussed on how service learning can not only cause a valuable impact on the community but also on the students, acting as a powerful experiential approach with outcomes on their moral, social and leadership aptitudes [85], [86].

A study about the use of ELT on Management Education showed that tailoring the activities to span all students' learning styles has improved their academic excellence and also their attitude towards learning [87]. Other two used it on the teaching of Requirements Engineering, one focused on exercising IS developers' communication skills while presenting prototypes [88]; while the other through the simulation of a business game where the students could experience the process and skills required with the purpose of easing their transition to the workplace [89].

An Organizational Leadership program applied the ELT on a Research and Analytical Skills for Decision Making course, where they found that it can indeed boost significantly the amount of learning happened, but that it also requires a higher monitoring by the instructors, hindering the implementation in large classrooms [90]. They have to be fully aware of when and how each of the four phases of the ELT model is taking place, in order to the students have a full learning experience.

One of the articles mentioned the interesting use of Dramaturgical Teaching as the means to apply the Experiential Learning [91]. However, the professor was the one to play the role of three different kinds of leaders for the students, so they might have learned how to deal with these kinds of leaders, but they didn't live the leadership role themselves.

Another remarkable use of the ELT was on an arts-based leadership development, where business students had the opportunity to conduct a chamber choir [92]. This approach explored an important aspect that is commonly forgotten or underestimated: "Leadership is an emotional, embodied, and interactive phenomenon between people". It is crucial to state the importance of social and emotional intelligences for leadership and not oversimplify it to a predominantly rational process.

Applying ELT in leadership coaching is apparently much simpler than using it in a classroom, once in an individual approach it is possible for the Coach to make use of Kolb's Learning Style Inventory to assess the coachee's learning style [93]. This allows a much deeper and specific work on the person's abilities and thus generating a much more significant result. Although in a classroom the professor could even assess the learning styles of all students, it would not be practical to embrace all the four on his/her teaching. Such endeavor would be not only exceedingly complex but also result in either dividing the class time between the four styles or breaking the class into four groups, and both options are not reasonable in the pedagogical point of view.

Even school leaders themselves are complaining that formal leadership programs don't prepare them enough for the rigorous work of running the schools and requiring more individualized and practical ways to develop leadership for their jobs [94]. It is argued that this would both increase the number of future leaders as well as bring a development climate for the whole organization.

Finally, the last study was selected with the intention of swelling the discussion about the gender problem of leadership. According to [95], the experiential components of leadership courses (such as volunteer service, studying abroad, and internships) can result just as much into leadership outcomes as into identity development as female leaders.



*"Don't tell people how to do things, tell them what to do and let them surprise you with their results."*

*George S. Patton Jr.*

# 7. Results

---

## 7.1. Group Experiment

When searching for leadership group activities, there was an overwhelming amount of results, but mostly all of them were related to teamwork activities, even that explicitly mentioning that they were leadership activities. A book by Stephen Kaagan even used the expression “Experiential Learning” on its title, but it didn’t mention anything about Kolb [96]. For this reason, the activities were collected from the George Mason University website [97] and selected regarding their completeness (detailed information about it) and relevancy to the leadership skills defined on Section 2.1.

Because the time and resources for this study were limited, the activity was planned for only a small group of students (N=12), just as a pilot to evaluate how easily the framework could be adopted and what would be the difficulties on using it. Therefore, the selection of the group activity was based on the following criteria:

- Time needed for the execution was less than 30 minutes
- Group size was around 10 people
- The materials needed were inexpensive and easy to buy
- Time for set up was minimum
- Group movement was limited to facilitate the recording

Considering these criteria, the most adequate group activity was the “Build a pyramid”, for fulfilling all of them and being simple enough for a pilot in which the instructor (the author) was also a graduate student, with only a few dozen experiences in conducting group activities, instead of a professional instructor that had done it hundreds of times. A brief overview about the activity is represented on Table 3 below:

<b>Activity</b>	“Build a Pyramid”
<b>Description</b>	Groups of about 6-8. Ask them to come up with 6 words that are essential for a good team (e.g. trust, communication). Have 6 red plastic cups (or other kinds) for each table/group and tell them to write down a word on each cup. Then they have to use the “rubber band tool” to create a pyramid with the cups. Can’t touch the cups, must use the tool only. The tool is approximately 8 strands of string connected to a rubber band that could go around a cup to pick it up. Each person must use at least 1 string. Ask about the words they chose and how they worked as a team.
<b>Materials</b>	Plastic clubs, rubber bands (1 per group), 8” strings (enough for each person)
<b>Focus Areas</b>	Communication, Team work, Problem Solving, Group dynamics.
<b>Time Needed</b>	20 minutes
<b>Group Size</b>	Any size (4-8 people in each group depending on number of people)

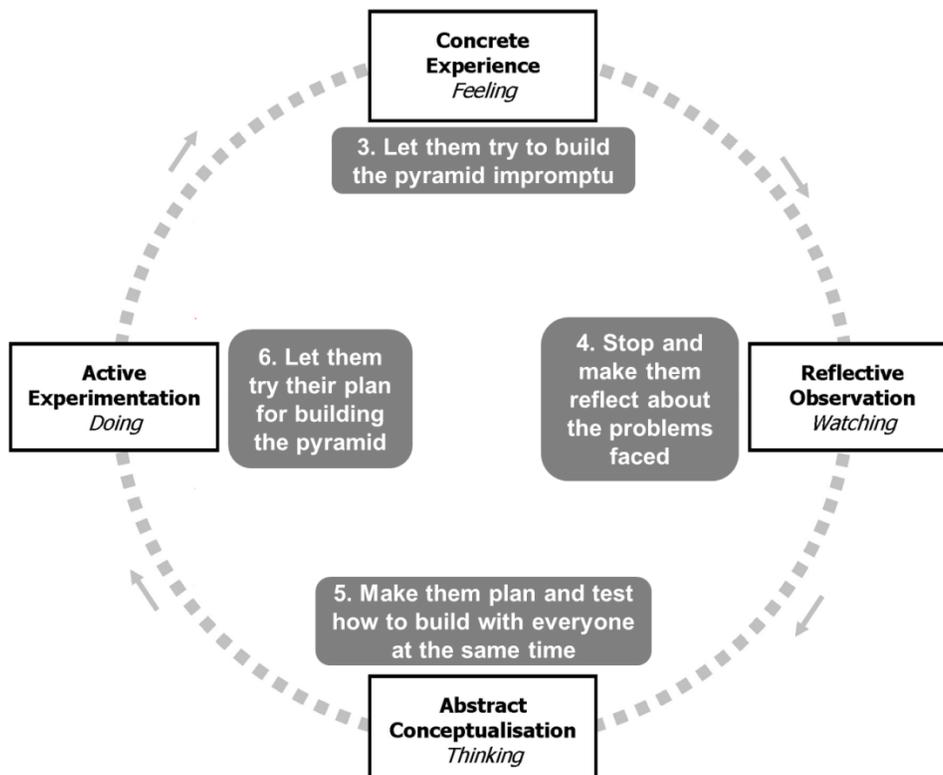
**Table 3 - Build a Pyramid activity overview**

Once the group activity was selected, an execution plan (exhibited below on Table 4) was prepared and validated with the advisor, in order to assure the time for each section was sufficient and that the experiential learning framework was properly used on the experiment.

Activity Itinerary	
Item	Duration
1. Thank their presence and explain the purpose of the experiment	2 min
2. Explain the activity and how the pyramid must be	3 min
3. Let them try to build the pyramid impromptu	5 min
4. Stop and make them reflect about the problems faced	5 min
5. Make them plan and test how to build with everyone at the same time	5 min
6. Let them try their plan for building the pyramid	5 min
7. Finish the experiment and discuss about their leadership	10 min
8. Ask them to fill the feedback form	3 min
9. Organize and vacate the room	2 min
<b>Total</b>	<b>40 min</b>

**Table 4 - Execution plan for the "Build the pyramid" activity**

This itinerary was created iteratively and always with the intent to match the steps of the Experiential Learning Theory. Combining both we can draw the following parallel on Figure 13, which will be the foundation of the framework of this study (later presented on Section 8):



**Figure 13 - ELT model combined with activity itinerary**

To match the cycle before mentioned, three significant modifications were implemented in the selected group activity with the purpose of making it even more appropriate and loyal to Kolb's Experiential Learning Theory:

- I. The part of selecting 6 words was entirely removed from the activity, in order to make each phase well defined and not blend Abstract Conceptualization (thinking about good teams) with Concrete Experience (trying to build the pyramid).
- II. They were the ones responsible for thinking and building the tool, which allowed them to reflect, learn, and experiment more truthfully on improving their tool.
- III. The restriction of "each person must use at least 1 string" was only added after they reflected about the problems and created a plan, allowing them to learn with their mistakes and to prepare for the extra challenge.

The whole experiment was recorded so the group interaction could be better analyzed and discussed. For this, the students filled a Video Release Form (available on Appendix B) allowing their image to be used for educational purposes.

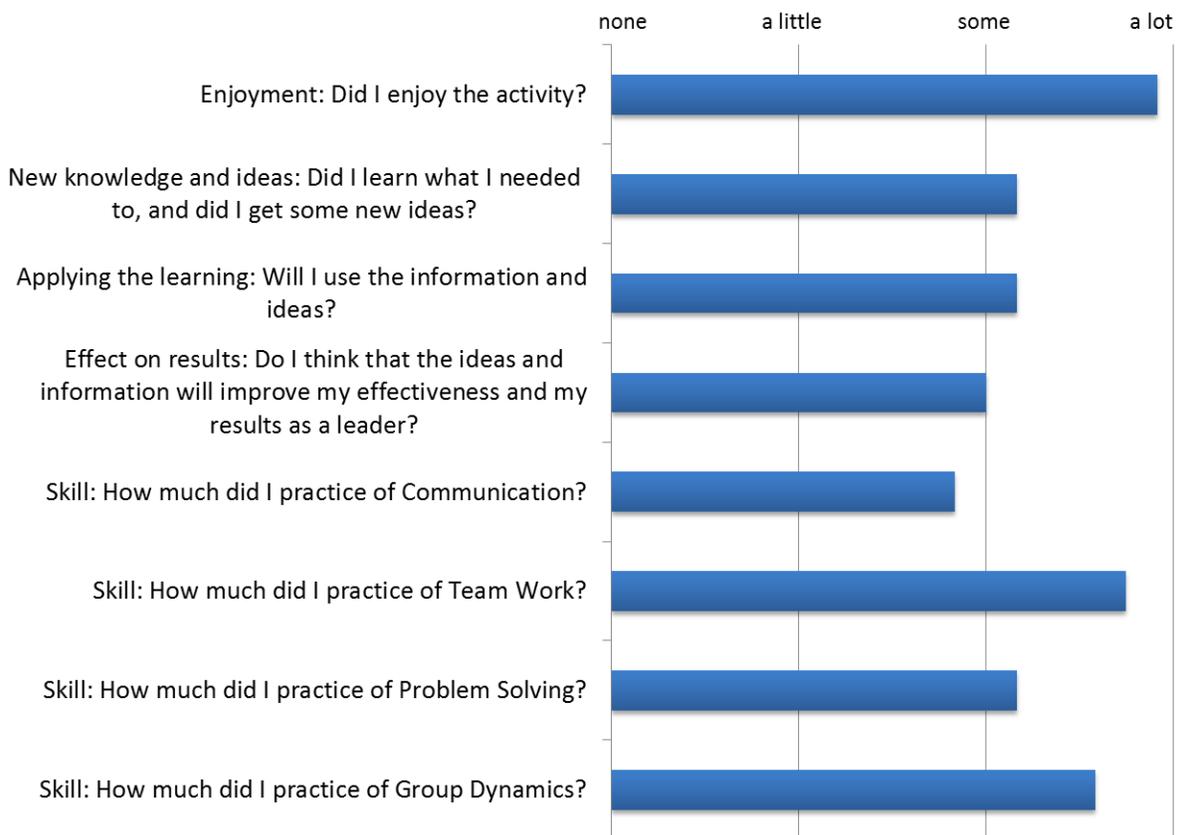
On the video, it was visibly exposed how the students reacted in each phase of the Experiential Learning Cycle and how the leadership process affected the group dynamics, discussion that will be done in Section 8.

## **7.2. Students evaluation of the activity**

After the group activity was completed, the students filled a form for evaluation and feedback based on a model from Kirk Patrick [97] (available on Appendix C), in order to assess the following aspects:

- How much the students enjoyed the activity
- How much knowledge and ideas they acquired with it
- How much they will use in their lives what they learned
- How much they think the activity improved on their results as leaders
- How much they put into practice of each related skill of the activity

The only addition between the template provided and the modified version for this study (available on Appendix D) was the last topic, where they could evaluate how much of each of the skills related to the activity was really practiced during the experiment. This difference might be valuable in the future, with many activities, so the professor can keep track of the most effective ones. All the questions were objective with 4 alternatives to choose (a lot, some, a little, none) but they also had a space in front for subjective answers, where they could describe the highlights or suggest improvements.



**Figure 14 - "Build the pyramid" activity evaluation**

The Figure 14 above presents a compilation of the responses of the students for the mentioned feedback form, considering a linear ratio (0 - none, 1 - a little, 2 - some, 3 - a lot) for the representation of the average response.

It is possible to conclude from this feedback that virtually all the students (91% with 0.27 deviation) truthfully enjoyed the activity but 3 of them (25% with 0.91 deviation) were not sure on how the information could improve their effectiveness as leaders. They found that the most practiced skill was Team Work (with 0.59 deviation) and the least was Communication (with 0.37 deviation).

The fact that this experiment was conducted outside the context of a Leadership classroom might have impacted significantly on how the students provided the feedback, once they probably didn't have a clear view of what exactly they were learning, how to apply these skills in real life, and how they will improve their effectiveness as leaders, which are related to the questions 2, 3, and 4 of the evaluation form. For this reason, these results need to be revalidated by professors in leadership courses in order to assure their accuracy relative to the real environment and the impact of a professional instructor.

The next section will discuss in deep the results of this evaluation as well as explore the particularities of the experiment and elaborate on the application of the Experiential Learning Theory as a framework for leadership group activities.



*"What you are stands  
over you the while, and  
thunders so that I  
cannot hear what you  
say to the contrary."*

*Ralph Waldo Emerson*

## 8. Discussion

---

The population of students (N=12) was between 20 to 30 years old, being 7 women (58%) and 5 men (41%), and most of them with little or no leadership experience. From their demographics, it is important to highlight that there was an immense discrepancy regarding their nationalities: 9 of them were Indian (75%), 1 Chinese (8.3%), 1 Greek (8.3%) and 1 Iranian (8.3%). The impact of a prevalent culture in the activity is unknown and would require a profounder study in order to assess if it is positive, negative, or irrelevant.

In the beginning of the activity, the students were asked to self-divide themselves in two groups, the first of which had 4 men and 2 women (called Group 1 from now on), while the second had 5 women and 1 man (Group 2). This personnel coincidence in Group 2 allowed the well debated gender problem of leadership [2.8] to occur on their team, where the man was the one guiding most of the actions of the group, although possibly unconscious of what he was doing. Another interesting observation related to gender was that while the men were focused more on the action and “getting the job done” (as one of them said), the women were the ones, in both groups, who stopped what they were doing and thought about building the tool to improve their efficacy on carrying the cups. Evidently, these happenings might change depending to the context, the culture, and the personalities of the men and women composing the group, and

thus should not be considered as a general rule. Nevertheless, it was interesting to see that the micro-universe of such a trivial group activity like that, still reflected what we see in most organizations and societies – the macro-universe.

The Observational Methodology evidenced that both teams made no plan before starting their work and even though it was mentioned several times that they were supposed to build a tool to assist their job, still, the Group 1 on their first try used mostly the strings themselves to carry the cups and mount the pyramid. One of them even mentioned that “everyone had a different tool”, what suggests that they were entirely driven by the competition with the other team and that all they cared was to build the pyramid, no matter the tools or the efficiency. This occasionally led to their failure on the first try to build the pyramid in the defined time limit, which supports the value of a leader that can think on the run and plan correspondingly to their efficacy, objectives, and restrictions.

However, even with the lack of planning and adhering to the guidelines of the activity, the observation of a high energy among both teams was a positive indicator according to John Tang and Larry Leifer:

“The higher the energy (i.e., the extent to which groups are interested in and willing to spontaneously challenge each other's thinking and defend their own), the more confident you can be that: (1) they have taken their group work seriously and (2) their ability to tackle even more difficult learning tasks has been significantly enhanced”. [69]

Through the Interaction Analysis it was also possible to witness that, although the communication process (i.e. dialogs and discussions) was relatively democratic and decentralized, the coordination process (i.e. guiding the actions) was mostly done by one or two on each team, while the rest was basically following the orders. This indicates that the leadership process really happened but that only a few students could really experience leadership in practice, which is not necessarily a bad point, as this prepares them for facing the same process everywhere else. Nonetheless, the activity

still allowed these students to practice their leadership skills, even not being the leaders, once they were using them to work on the group and also that the professor could raise the discussion about this, starting to develop on them the awareness to be leaders.

Regarding the leadership styles described by Daniel Goleman [40] and presented on Figure 5, it was possible to visualize by the group dynamics and body language of the students during the activity, that the two major styles used by them were the Democratic and the Pacesetting. These styles might vary according to the type and mechanisms of the group activity or even to the individual personalities of the group, and because of this, more research is needed to establish any correlations among these.

## **8.1. Classroom Evaluation**

Using again the classroom model by Hert-Lazarowitz [68] combined with the Interaction Analysis of the video, it was possible to evaluate the behavior of the classroom during the activity and all the aspects regarding the task, the instructor and the students. The results of this analysis are represented below on Figure 15.

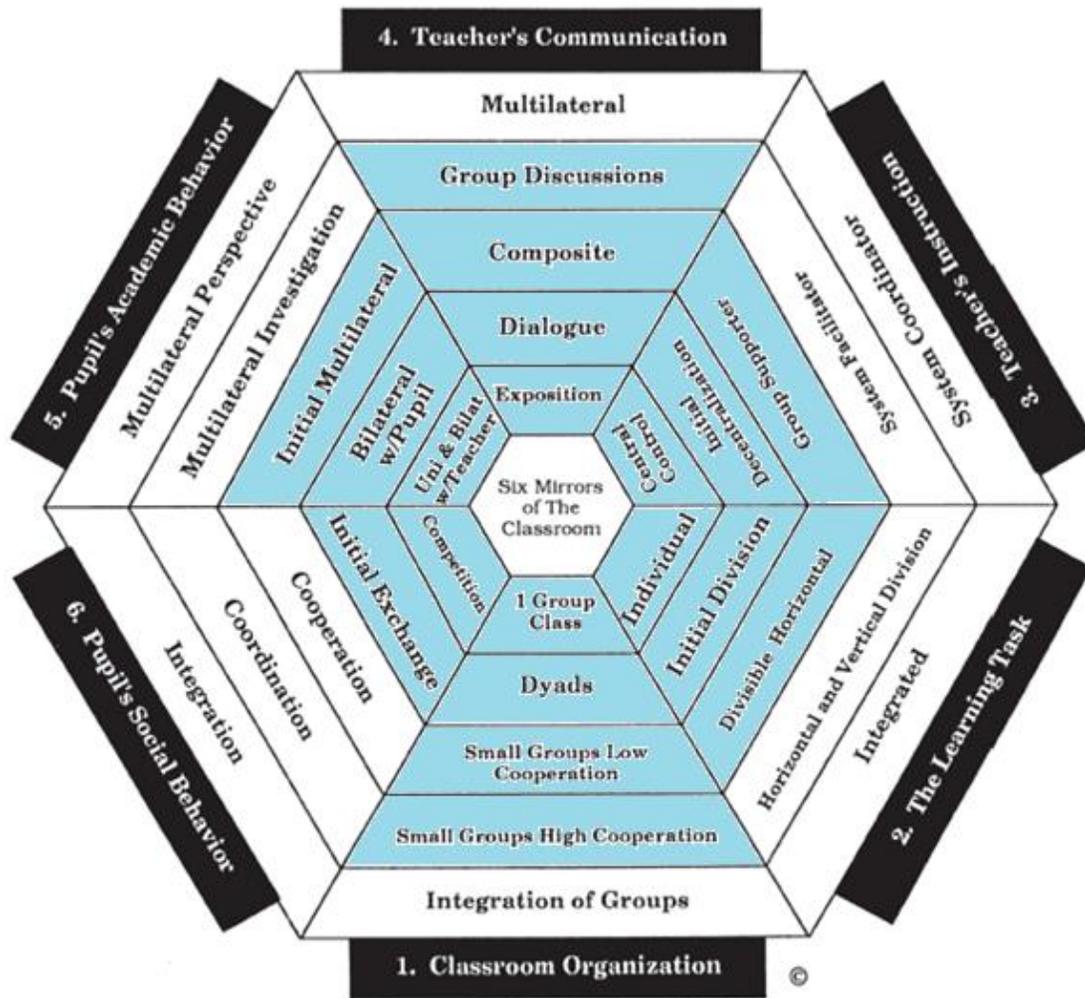


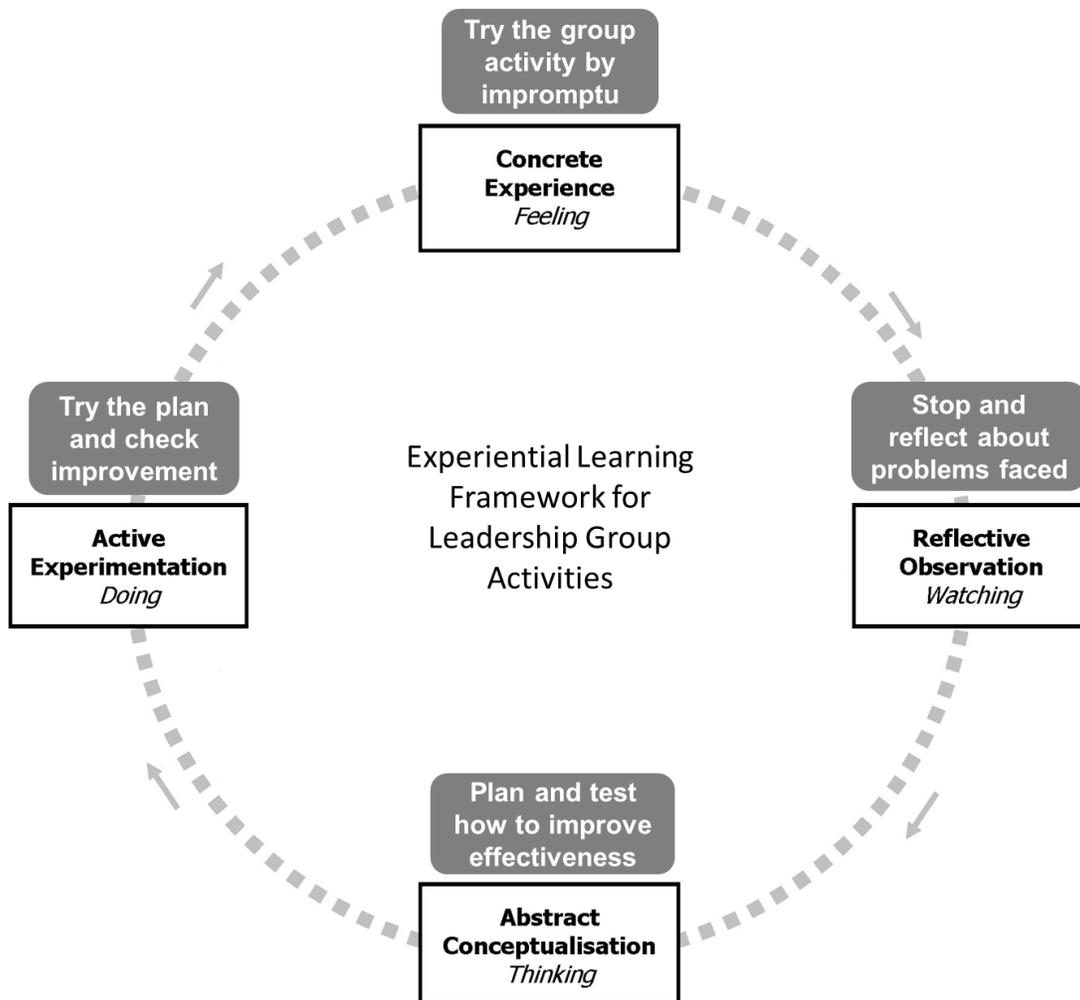
Figure 15 - Evaluation of the Six Mirrors of the Classroom [68].

Through this model it was possible to visualize in a holistic manner, how the many different factors that compose a classroom were balanced during the leadership group activity. In overall, the result was moderately satisfactory, with almost all the items having a grade of three or more. The classroom organization was of 'small groups with high cooperation', once they were not exactly integrated as a whole; Instead of an individual learning task, the activity allowed the students to work on a horizontal division; Due to the nature of the task, the instructor could act as a group supporter, even not being a professional on conducting group activities; The communication in the classroom happened in group discussion instead of a common exposition; The academic

behavior of the students was on an initial multilateral level, rather than unilateral or bilateral; Only their social behavior that was not the most desirable, where the teams mostly competed against each other (even sometimes making fun with the opposite team, although in a playful way rather than mockery), having just an initial exchange during the discussions.

## **8.2. ELT Framework for Leadership Group Activities**

Based on the adaptation of the itinerary to match Kolb's Experiential Learning Theory (represented on Figure 13), it is possible to elaborate a more generalized version that could match most kinds of leadership group activities. This framework has the intent to help professors to make use of the ELT model to explore all the different learning styles in a structured approach, thus allowing students to also improve their least explored style. Figure 16 depicts a proposal for this framework.



**Figure 16 - Model of framework to use ELT for leadership group activities**

The fundamental premise of this leadership group activity framework is on exploring the impromptu experience of the students; then make them reflect about the problems; learn with their mistakes and plan ways to improve; and finally experiment with the plan to check if they really learned a more effective way. Through these four different learning styles implemented on the group activities, students can have a more complete and deeper experience, therefore a better learning.



*“Convictions are more  
dangerous enemies of  
truth than lies.”*

*Friedrich Nietzsche*

## 9. Conclusion

---

It is evident that simple group activities, like the one presented on this study, are far from enough to make students master such complex and time-consuming to learn skills. This work has a modest ambition of merely presenting a realistic alternative that is just better than the traditional way of teaching leadership, even not being the best. The intent was to introduce an applicable framework that is both effortless and inexpensive to apply, to serve as a transition to adopting practical learning methodologies without needing vast cultural changes on the university or large budget approvals.

Another approach could be to use other courses' projects to practice these leadership skills, with small tasks to accomplish inside their other teams. The problem with this approach is that students still feel "carrying their past with them" and thus struggle to implement any change with their teammates that already knew them. With fast and simple activities, as the one examined, they are allowed to "be a new person" even that for only a brief moment, and hence try other approaches, behaviors, and skills without people thinking that they are "acting different".

A hybrid approach between these two ways could also be a good alternative to allow them to "be a new person" at the same time that they try to "change who they are" for teammates. This way they could have these rapid experiences as a laboratory to

exercise these new skills, and only later apply them on their real lives and learn about the extra complications of a real context.

Nonetheless, the students' evaluation of the pilot was certainly positive. The Interaction Analysis showed that the students truly dived into the experience and most of them could experience some moments leading inside their teams. Regarding the skills, it is clear that they had the chance to experience some amount of each skill involved in the group activity, and it is reasonable to predict that on a leadership course they would feel even more confident to have practiced what they already learned.

## 9.1. Limitations

- Little time and resources to conduct more complete experiments with a larger number of activities, to compare the similarities of the results and discuss the particularities of each.
- The instructor (the author) had limited practice in running group activities, better results might be achieved by experienced professors.
- Once the framework was developed from the lessons of a single experiment, it still lacks significantly more validation in order to be in a stage that it can be widely adopted in technology universities.

## 9.2. Future Work

As already mentioned on the limitations of this work, for this study to be well accepted by the academy, these experiments should be replicated with larger groups and more activities. For this reason, this would be the biggest priority for a future work.

Besides the validation of the framework, a deeper analysis of the impact of these leadership group activities on these students on the future, when they are already leading, is also crucial for the evolution of this study. It could reveal which activities were most effective and how exactly they impacted the students on the long term.



*"What paltry learning is  
congealed in dumb  
books!"*

*Djeli Mamoudou  
Kouyate*

## 10. References

---

- [1] F. Brooks, *The mythical man-month and other essays on software engineering*. Chapel Hill: Dept. of Computer Science, University of North Carolina at Chapel Hill, 1974.
- [2] F. Brooks, 'No Silver Bullet Essence and Accidents of Software Engineering', *Computer*, vol. 20, no. 4, pp. 10-19, 1987.
- [3] T. DeMarco and T. Lister, *Peopleware*. New York, NY: Dorset House Pub. Co., 1987.
- [4] The Standish Group, 'The CHAOS Report', 1994.
- [5] J. Eveleens and C. Verhoef, 'The rise and fall of the Chaos report figures', *IEEE Softw.*, vol. 27, no. 1, pp. 30-36, 2010.
- [6] The Standish Group, 'CHAOS Manifesto 2013: Think Big, Act Small', 2013.
- [7] R. Glass, 'Failure is looking more like success these days', *IEEE Softw.*, vol. 19, no. 1, pp. 104-103, 2002.
- [8] M. Jørgensen and K. Moløkken-Østvold, 'How large are software cost overruns? A review of the 1994 CHAOS report', *Information and Software Technology*, vol. 48, no. 4, pp. 297-301, 2006.
- [9] K. Emam and A. Koru, 'A Replicated Survey of IT Software Project Failures', *IEEE Softw.*, vol. 25, no. 5, pp. 84-90, 2008.
- [10] H. Abdul-Rahman, F. Mohd-Rahim and W. Chen, 'Reducing failures in software development projects: effectiveness of risk mitigation strategies', *Journal of Risk Research*, vol. 15, no. 4, pp. 417-433, 2012.
- [11] T. Lehtinen, M. Mäntylä, J. Vanhanen, J. Itkonen and C. Lassenius, 'Perceived causes of software project failures – An analysis of their relationships', *Information and Software Technology*, vol. 56, no. 6, pp. 623-643, 2014.

- [12] J. Pinto, and D. Slevin. 'Critical success factors across the project life cycle' Project Management Institute, 1988.
- [13] The Project Management Institute, 'Examining Project Manager Insights of Agile and Traditional Success Factors for Information Technology Projects', Marian University, 2011.
- [14] B. Shore, 'Failure Rates in Global IS Projects and the Leadership Challenge', *Journal of Global Information Technology Management*, vol. 8, no. 3, pp. 1-5, 2005.
- [15] P. Nixon, M. Harrington and D. Parker, 'Leadership performance is significant to project success or failure: a critical analysis', *Int J Productivity & Perf Mgmt*, vol. 61, no. 2, pp. 204-216, 2012.
- [16] L. Raccoon, 'A leadership primer for software engineers', *ACM SIGSOFT Softw. Eng. Notes*, vol. 31, no. 4, p. 10, 2006.
- [17] V. Anantatmula, 'Project Manager Leadership Role in Improving Project Performance', *Engineering Management Journal*, vol. 22, no. 1, pp. 13-22, 2010.
- [18] L. Geoghegan and V. Dulewicz, 'Do project managers' leadership competencies contribute to project success?', *Proj Mgmt Jrnl*, vol. 39, no. 4, pp. 58-67, 2008.
- [19] J. R. Turner and R. Müller, 'The project manager's leadership style as a success factor on projects: A literature review', *Project Management Institute*, 2005.
- [20] L. Yang, C. Huang and K. Wu, 'The association among project manager's leadership style, teamwork and project success', *International Journal of Project Management*, vol. 29, no. 3, pp. 258-267, 2011.
- [21] Center for Creative Leadership, 'Blended Learning for Leadership: The CCL Approach', 2014.
- [22] Deloitte Consulting LLP and Bersin, 'Leaders at all levels: Close the gap between hype and readiness', Deloitte University Press, 2014.
- [23] K. O' Leonard and L. Loew, 'Leadership Development Factbook 2012 Benchmarks and Trends in U.S. Leadership Development', *Bersin.com*, 2015. [Online]. Available: <https://www.bersin.com/Store/Details.aspx?docid=15587>. [Accessed: 15- Nov- 2015].
- [24] S. Garr and L. Loew, 'High Impact Leadership Development Driving Organizational Maturity and Business Impact', *Bersin.com*, 2015. [Online]. Available: <https://www.bersin.com/Practice/Detail.aspx?id=14449>. [Accessed: 15- Nov- 2015].
- [25] Ashridge, 'Developing the Global Leader of Tomorrow', Hertfordshire, 2009.
- [26] Gallup, 'State of the American Manager: Analytics and Advice for Leaders', 2015.
- [27] The Conference Board, 'Job Satisfaction: 2014 Edition', 2015.

- [28] J. BUTLER and R. CANTRELL, 'Effects of Perceived Leadership Behaviors on Job Satisfaction and Productivity', *Psychological Reports*, vol. 80, no. 3, pp. 976-978, 1997.
- [29] H. Saleem, 'The Impact of Leadership Styles on Job Satisfaction and Mediating Role of Perceived Organizational Politics', *Procedia - Social and Behavioral Sciences*, vol. 172, pp. 563-569, 2015.
- [30] The Ken Blanchard Companies, 'The High Cost of Doing Nothing: Quantifying the Impact of Leadership on the Bottom Line', 2009. [Online]. Available: [http://www.kenblanchard.com/img/pub/Blanchard\\_The\\_High\\_Cost\\_of\\_Doing\\_Nothing.pdf](http://www.kenblanchard.com/img/pub/Blanchard_The_High_Cost_of_Doing_Nothing.pdf). [Accessed: 15- Nov- 2015].
- [31] A. Hussey, 'The effect of ethics on labor market success: Evidence from MBAs', *Journal of Economic Behavior & Organization*, vol. 80, no. 1, pp. 168-180, 2011.
- [32] T. Carlyle, *On heroes, hero-worship, and the heroic in history*. New York: Frederick A. Stokes & Brother, 1842.
- [33] H. Spencer, *The study of sociology*. New York: D. Appleton, 1873, p. 30.
- [34] W. James, 'Great Men and their Environment', Harvard Natural History Society, 1880.
- [35] F. Fiedler, *A theory of leadership effectiveness*. New York: McGraw-Hill, 1967.
- [36] V. Dulewicz and M. Higgs, 'Assessing leadership styles and organizational context', *Journal of Managerial Psychology*, vol. 20, no. 2, pp. 105-123, 2005.
- [37] R. Lord, R. Foti and C. De Vader, 'A test of leadership categorization theory: Internal structure, information processing, and leadership perceptions', *Organizational Behavior and Human Performance*, vol. 34, no. 3, pp. 343-378, 1984.
- [38] J. Sosik and V. Godshalk, 'Leadership styles, mentoring functions received, and job-related stress: a conceptual model and preliminary study', *Journal of Organizational Behavior*, vol. 21, no. 4, pp. 365-390, 2000.
- [39] A. Eagly and M. Johannesen-Schmidt, 'The Leadership Styles of Women and Men', *Journal of Social Issues*, vol. 57, no. 4, pp. 781-797, 2001.
- [40] D. Goleman, R. Boyatzis and A. McKee, *Primal leadership: Realizing the Power of Emotional Intelligence*. Harvard Business School Press, 2002.
- [41] S. Gherardi and B. Poggio, 'Tales of Ordinary Leadership. A Feminist Approach to Experiential Learning', *Revista de Sociologia*, vol. 93, pp. 53-65, 2009.
- [42] A. Eagly, S. Karau and M. Makhijani, 'Gender and the effectiveness of leaders: A meta-analysis.', *Psychological Bulletin*, vol. 117, no. 1, pp. 125-145, 1995.
- [43] C. Chianglin, J. Chen and P. Yu, 'Transforming from a Researcher into a Leader in High-Tech Industries', *Int. J. Info. Tech. Dec. Mak.*, vol. 03, no. 03, pp. 379-393, 2004.

- [44] Blanchard, Ken. 2015. 'Critical Leadership Skills - Key Traits That Can Make or Break Today's Leaders'. The Ken Blanchard Companies. [http://www.kenblanchard.com/img/pub/pdf\\_critical\\_leadership\\_skills.pdf](http://www.kenblanchard.com/img/pub/pdf_critical_leadership_skills.pdf). [Accessed: 28- Oct- 2015].
- [45] Prive, Tanya. 2012. 'Top 10 Qualities That Make A Great Leader'. Forbes. <http://www.forbes.com/sites/tanyaprive/2012/12/19/top-10-qualities-that-make-a-great-leader/>. [Accessed: 28- Oct- 2015].
- [46] Zenger, Jack, and Joseph Folkman. 2014. 'The Skills Leaders Need At Every Level'. Harvard Business Review. <https://hbr.org/2014/07/the-skills-leaders-need-at-every-level>. [Accessed: 29- Oct- 2015].
- [47] Downard, Brian. 2015. '31 Leadership Experts Reveal Top Leadership Skills & Traits'. ELIV8. <http://eliv8group.com/leadership-expert-roundup/>. [Accessed: 27- Oct- 2015].
- [48] Center for Creative Leadership, "Expanding the Leadership Equation: Developing Next-Generation Leaders", 2015.
- [49] C. Herbermann, 'Education in Ancient Egypt', *The American Catholic Quarterly Review*, vol. 18, no. 0271-5767, pp. 176-200, 2015.
- [50] G. Duke, 'Sophists | Internet Encyclopedia of Philosophy', *iep.utm.edu*, 2015. [Online]. Available: <http://www.iep.utm.edu/sophists/>. [Accessed: 09- Nov- 2015].
- [51] New World Encyclopedia, 'Platonic Academy', 2015. [Online]. Available: [http://www.newworldencyclopedia.org/entry/Platonic\\_Academy](http://www.newworldencyclopedia.org/entry/Platonic_Academy). [Accessed: 09- Nov- 2015].
- [52] B. Pauley, 'The Academy Versus The Lyceum', The Thin Tweed Line - Humanstudy.org, 2012. [Online]. Available: <http://www.humanstudy.org/history/2012-03-pauley-b.html>. [Accessed: 09- Nov- 2015].
- [53] C. Michael, 'Historiography and Roman Education', 1953. *History of Education Journal* 4. History of Education Society, pp. 149–56. [Online]. Available: <http://jstor.org/stable/3659151>.
- [54] H. Marrou, *A history of education in antiquity*. New York: New American Library, 1964, pp. 232-234.
- [55] R. Guiseppi, 'The History of Education', History-world.org. [Online]. Available: [http://history-world.org/history\\_of\\_education.htm](http://history-world.org/history_of_education.htm). [Accessed: 09- Nov- 2015].
- [56] P. Riché, *Education and culture in the barbarian West - sixth through eighth centuries*. Columbia: University of South Carolina Press, 1976, pp. 126-7, 282-98.
- [57] J. Hexter, 'The Education of the Aristocracy in the Renaissance', *The Journal of Modern History*, vol. 22, no. 1, p. 1, 1950.

- [58] M. McCall, M. Lombardo and A. Morrison, *The lessons of experience: how successful executives develop the job*. Lexington: Lexington Books, 1988.
- [59] J. Cross, '50 suggestions for implementing 70-20-10', *Internet Time Blog*, 2013. [Online]. Available: <http://www.internettime.com/2013/02/50-suggestions-for-implementing-70-20-10/>. [Accessed: 13- Sep- 2015].
- [60] DeakinPrime, 'Demystifying 70:20:10', Deakin University, Melbourne, 2013.
- [61] J. Segers, 'The problem with the 70:20:10 rule in leadership development', *The Future Leadership Initiative*, 2012. [Online]. Available: <https://thefutureleadershipinitiative.wordpress.com/2012/08/04/the-problem-with-the-702010-rule-in-leadership-development/>. [Accessed: 13- Sep- 2015].
- [62] J. Williams, C. Townsend and J. Linder, 'Teaching Leadership: Do Students Remember and Utilize the Concepts We Teach?', *Journal of Leadership Education*, vol. 4, no. 1, pp. 62-74, 2015.
- [63] R. Gillies, 'Teachers' and students' verbal behaviors during cooperative and small-group learning', *British Journal of Educational Psychology*, vol. 76, no. 2, pp. 271-287, 2006.
- [64] D. Ancona and R. Cole, 'Strategies for Learning: Small-Group Activities in American, Japanese, and Swedish Industry', *Administrative Science Quarterly*, vol. 36, no. 2, p. 309, 1991.
- [65] C. Connolly, M. Carns, and A. Carns, Traditional-and activity-based laboratory groups: A quantitative comparison of two teaching approaches. *Journal of Professional Counseling, Practice, Theory, & Research*, vol. 33, no. 1, p. 4, 2005.
- [66] T. Tomcho and R. Foels, 'Meta-Analysis of Group Learning Activities', *Teaching of Psychology*, vol. 39, no. 3, pp. 159-169, 2012.
- [67] A. Yazedjian and B. Kolkhorst, 'Implementing Small-Group Activities in Large Lecture Classes', *College Teaching*, vol. 55, no. 4, pp. 164-169, 2007.
- [68] R. Hertz-Lazarovits and N. Miller, *Interaction in cooperative groups*. Cambridge: Cambridge University Press, 1992.
- [69] J. Tang and L. Leifer, 'An observational methodology for studying group design activity', *Research in Engineering Design*, vol. 2, no. 4, pp. 209-219, 1991.
- [70] L. Suchman, *Plans and Situated Actions: The Problem of Human-Machine Communication*. Cambridge [Cambridgeshire]: Cambridge University Press, 1987, p. 114.
- [71] L. Michaelsen, L. Fink and A. Knight, 'Designing Effective Group Activities: Lessons for Classroom Teaching and Faculty Development', *Professional and Organizational Development Network in Higher Education*, vol. 16, no. 373-397, 1997.

- [72] HayGroup, 'The Kolb Learning Style Inventory - Version 3.1 2005 Technical Specifications', Case Western Reserve University, 2005.
- [73] A. Kolb and D. Kolb, 'Experiential Learning Theory: A Dynamic, Holistic Approach to Management Learning, Education and Development', *The SAGE Handbook of Management Learning, Education and Development*, pp. 42-68, 2009.
- [74] A. Chapman, 'David Kolb's learning styles model and experiential learning theory', *Businessballs*, 2006. [Online]. Available: <http://www.businessballs.com/kolblearningstyles.htm>. [Accessed: 05- Nov- 2015].
- [75] D. Boud, R. Keogh and D. Walker, *Reflection, turning experience into learning*. London: Kogan Page, 1985.
- [76] M. Tennant, *Psychology and adult learning*. London: Routledge, 2006.
- [77] D. Holman, K. Pavlica and R. Thorpe, 'Rethinking Kolb's Theory of Experiential Learning in Management Education: The Contribution of Social Constructionism and Activity Theory', *Management Learning*, vol. 28, no. 2, pp. 135-148, 1997.
- [78] M. Reynolds, 'Critical Reflection and Management Education: Rehabilitating Less Hierarchical Approaches', *Journal of Management Education*, vol. 23, no. 5, pp. 537-553, 1999.
- [79] R. Vince, 'Behind and Beyond Kolb's Learning Cycle', *Journal of Management Education*, vol. 22, no. 3, pp. 304-319, 1998.
- [80] M. Smith, 'David A. Kolb on experiential learning.', *The encyclopedia of informal education*, 2010. [Online]. Available: <http://infed.org/mobi/david-a-kolb-on-experiential-learning/>. [Accessed: 19- Out- 2015].
- [81] M. Gitsham, *Developing the global leader of tomorrow*. Ashridge, 2008.
- [82] G. Warnick, J. Schmidt and A. Bowden, "An Experiential Learning Approach to Develop Leadership Competencies in Engineering and Technology Students", in *2014 ASEE Annual Conference*, Indianapolis, 2014.
- [83] J. Krupar and G. Suckarieh, "Leadership And Teamwork Education For Engineering And Technology Students", in *2005 ASEE Annual Conference*, Portland, 2005.
- [84] M. Gitsham, "Experiential learning for leadership and sustainability at IBM and HSBC", *Journal of Mgmt Development*, vol. 31, no. 3, pp. 298-307, 2012.
- [85] T. Smith and M. Rosser, "Leadership Development through Experiential Learning", in *Association of Leadership Educators Conference*, Ft. Worth, 2007.
- [86] K. Guthrie and T. Jones, "Teaching and Learning: Using Experiential Learning and Reflection for Leadership Education", *New Directions for Student Services*, vol. 2012, no. 140, pp. 53-63, 2012.

- [87] S. Penger, J. Znidarsic and V. Dimovski, "Experiential Learning And Management Education: Empirical Research And Implications For Practice In Higher Education In Slovenia", *International Journal of Management and Information Systems*, vol. 15, no. 1, pp. 23-34, 2011.
- [88] M. Qurban and R. Austria, "Improving the Communication Skills of IS Developers during Requirements Elicitation Using Experiential Learning", *Journal of Information Systems Education*, vol. 20, no. 3, pp. 301-311, 2009.
- [89] G. Regev, D. Gause and A. Wegmann, "Experiential learning approach for requirements engineering education", *Requirements Engineering*, vol. 14, no. 4, pp. 269-287, 2009.
- [90] J. Bangs, "Experiential Learning in an Organizational Leadership Program", *Journal of College Teaching & Learning*, vol. 8, no. 10, pp. 29-34, 2011.
- [91] J. Barbuto, "Dramaturgical Teaching in the Leadership Classroom", *Journal of Leadership Education*, vol. 5, no. 2, pp. 4-13, 2006.
- [92] I. Sutherland and J. Jelinek, "From Experiential Learning to Aesthetic Knowing: The Arts in Leadership Development", *Advances in Developing Human Resources*, vol. 17, no. 3, pp. 289-306, 2015.
- [93] E. Turesky and D. Gallagher, "Know thyself Coaching for leadership using Kolb's Experiential Learning Theory", *The Coaching Psychologist*, vol. 7, no. 1, pp. 5-14, 2011.
- [94] W. Zhang and M. Brundrett, "School leaders' perspectives on leadership learning: the case for informal and experiential learning", *Management in Education*, vol. 24, no. 4, pp. 154-158, 2010.
- [95] R. Belton, "The impacts of experiential learning on leadership identity in female college graduates", PhD, University of North Carolina at Greensboro, 2010.
- [96] S. Kaagan, *Leadership Games: Experiential Learning for Organizational Development*. Thousand Oaks, Calif.: Sage Publications, 1999.
- [97] George Mason University, "Leadership Activities and Exercises", 2015. [Online]. Available: <http://lead.gmu.edu/training-resources/activities-and-exercises/>. [Accessed: 02- Oct- 2015].
- [98] A. Chapman, "Donald Kirkpatrick's Learning Evaluation Theory", *Businessballs.com*, 2015. [Online]. Available: <http://www.businessballs.com/kirkpatricklearningevaluationmodel.htm>. [Accessed: 04- Oct- 2015].

*“Until you make the  
unconscious conscious, it  
will direct your life and  
you will call it fate.”*

*Carl Gustav Jung*

# 11. Appendices

---

## 11.1. Appendix A: List of Activities

### Activity 1: Build a pyramid

Groups of about 6-8. Ask them to come up with 6 words that are essential for a good team (e.g. trust, communication). Have 6 red plastic cups (or other kinds) for each table/group and tell them to write down a word on each cup. Then they have to use the “rubber band tool” to create a pyramid with the cups. Can’t touch the cups, must use the tool only. The tool is approx. 8 strands of string connected to a rubber band that could go around a cup to pick it up. Each person must use at least 1 string. Ask about the words they chose and how they worked as a team.

**Materials:** plastic clubs, rubber bands (1 per group), 8” strings (enough for each person)

#### Focus Area

- Communication
- Team work
- Group dynamics

**Time Needed:** 20 minutes

**Group Size:** Any size (4-8 people in each group depending on number of people)

#### Directions

- Ask them to come up with 6 words that are essential for a good team (e.g. trust, communication).

- Give out 6 plastic cups for each table/group and tell them to write down a word on each cup.
- Once they label their cups, give them string (1 for each person) and 1 rubber band
- Using the string and rubber band, they must build a pyramid with the cups
- They can't touch the cups, must use the tool only.
- Each person must use at least 1 string Ask about the words they chose and how they worked as a team.

### **Debriefing Questions**

- How easy or difficult was this activity?
- When the task was first revealed, what were your immediate thoughts?
- What did you need to be successful? Or, what would you have needed to do to be successful?
- How did you choose the words on the cup and how do you think you worked as a team?
- A larger pyramid (with more skills) is not as high

## **Activity 2: Bull Ring Activity**

**Materials:** Bull Ring Set

### **Focus Area**

- Teamwork
- Group dynamics
- Communication
- Relationship to working with small groups
- Managing delicate information/tasks
- Facilitation of someone else's learning process

**Time Needed:** 45 minutes

**Group Size:** No more than 20 per bull ring set

### **Directions**

- Make sure you have an open space to lay the bull ring out
- Place the bull ring in the center of the room and have the group work together to pull all of the strings out like a sunshine
- Once the bull ring is laid out, place the tennis ball in the center of the ring
- Place the cup somewhere at the opposite side of the room
- Group works together to pick tennis ball up and transport it using the bull ring
- The goal is to safely get the ball into the cup without dropping it
- If they drop the ball, they have to go back to the beginning and start over
- They are not allowed to touch the ball at any time except to place it back on the ring
- They can only touch the strings
- To make it more challenging, once the group is moving:

- You can take away sight or talking from participants (ex: everyone wearing jeans can't talk; if you are wearing flip flops you can't see; take "speaking" away from folks who are talking or dominating the conversation)
- Once the group gets close to the cup, move it to another location (this will resemble "change" – you can use this when you debrief)
- Activity is over when they get the ball into the cup without knocking the cup over (feel free to adjust level of difficulty depending on the group needs)

### **Debriefing Questions**

- How did it feel to do this activity?
  - Communication
  - Changing the scenario and the surroundings
  - Challenging you – taking you out of your comfort zone
- Did you find it challenging? If so, what did you find challenging?
- How does this relate to working in a team setting?
  - Helping others to find their strength
  - Trusting others
  - Trusting in the unknown – trying things out – giving everything/everyone a fair chance
  - Working together to achieve the goal/task
  - Valuing the journey it took to get there
- What did you think of the group dynamics and how did changing the "situation" or the "surroundings" impact the team and accomplishing your goal?
- What did it feel like when the cup was moved?
- How does this activity resemble things like: mission completion, having your voice heard, getting the ball in the cup, working together as a team, finding the best solution, hearing everyone, etc.)

## **Activity 3: Lego Activity – Building Replica**

### **Materials**

- Pre-built lego sets (you will need to make sure you have 4 pre-built lego sets depending on your group size)
- Make sure you have 4 bags with the exact legos you used to build each structure

### **Focus Area**

- Communication
- Giving clear directions
- Role/responsibilities
- Team work

**Time Needed:** 30 minutes

**Group Size:** 20-30

### **Directions**

- Have students pick group/identity from the bag: Builder, Runner, Looker, and Observers
- Break into groups based on color.
- Explain
  - The **Builder** receives bag of legos. He is the only person who may touch the legos. He may not speak. He takes directions on what to build from the runner. Runner tells the builder what the looker told him/her.
  - The **runner** and looker may converse freely whenever necessary about the model. The runner may not touch the legos, and only the runner may speak to the builder.
  - The **looker** sees the original model. The looker looks at the original model and describes it to the runner. The looker may not see what the builder is doing. The looker may only speak to the runner.
  - The **observers** write down observations about the process. Observers may not speak to the builder, runner, or looker, but they may observe everything. Have 15 minutes total to build the model as close to the original.
  - End of 15 minutes groups meet back together to look at their finished model and compare it to the original.

### Debriefing Questions

- Have groups give an overview of what happened during the group process (observers report out what they noticed)
- What was it like to be the “Runner”?
- What was it like to be the “Looker”?
- What was it like to be the “Builder”?
- What was it like to be the “Observer?”
- How did you communicate with the group?
- How does this activity relate to being in a student organization, group, or team setting?
- How could these “roles, ex: Runner, Looker, Builder, Observer” relate to the role you play or interact within a group setting?

## Activity 4: Pop Fly Challenge

### Materials: pop fly sets

- Duct tape
- 3-5 paint stirrers
- 1 ping pong ball
- 1 wooden block or spool
- 3 oz cups

### Focus Area:

- Communication
- Planning
- Decision making

- Trial and error

**Time Needed:** 20-25 minutes

**Group Size:** 20-30 people

**Directions:**

- Using the materials that you have been given, make something that launches a ball high enough so you can catch it.
- The cup must be free standing when it catches the ball
- You cannot use your hands to throw the ball
- Think of different ways to put together and develop a plan
- First goal: launch it (see how high it goes)
  - You can make it a competition amongst the teams to see who's ball goes the highest
- Second goal: launch and catch it
  - You can make it a competition amongst the teams to see who catches the ball first

**Debriefing Questions**

- What made this activity challenging?
- How did you come up with your plan?
- How were the team dynamics/group dynamics?
- What was it like to successfully get the ball into the cup?
- What did you learn from this activity that you can use in your role on the team and within the organization?

## **Activity 5: Caterpillar Traverse**

**Group Size:** 4 – 12

**Time:** 20 – 40 minutes (without debrief)

**Set Up Time:** 5 minutes

**Game Objective**

With ankles taped, the team travels as a unit from Point A to Point B.

**Skills Developed**

Clear Communication, Trust, Planning, Patience, Goal Setting and Achievement, Resource Management

**Set Up / Preparation**

1. Tape two parallel lines (boundary lines) on the ground 9 - 10 feet apart.
2. In between the parallel lines, tape three squares on the ground with sides of the squares measuring approximately two feet. The squares can be placed in a straight line

or in a zig-zag (see photo). The squares should be no more than 12 inches apart from each other and the end squares no more than 12 inches from the parallel lines.

3. Start by asking the group to stand behind one of the boundary lines.

4. Have the team line up shoulder to shoulder (and ankle to ankle). Provide each person with a piece of tape long enough to tape feet (or ankles) together. Suggest participants reach down and tape their right foot (or ankle) to their neighbor's left foot (ankle). NOTE: Do not tape skin. Be aware that duct tape may damage some types of shoes and clothing.

### **Rules**

1. The boundary ropes and hoops may not be moved.
2. The group must remain in a line with ankles tied throughout the activity.
3. Stepping outside of the hoops while traveling to the rescue ship is not permitted.
4. No other equipment may be used.
5. Violation of a rule may result in a penalty. (Example: touches outside of the hoops will require the team to start over)

### **Safety Warning**

1. People with knee, ankle or back injuries should not participate.
2. Ankles should be taped together loosely to help reduce the likelihood of injuries.
3. It's important for the group to move slow so no one gets hurt.
4. Do not allow people to put tape on bare skin because removing the tape will cause injury.

### **Facilitator Notes**

1. This activity is best left for groups that are patient. Do not attempt this activity with a rambunctious hyperactive group.
2. The group movement will remind you of a centipede.
3. This activity emphasizes communication, careful steady movement and team coordination.

### **Debriefing Suggestions**

Prior to starting the activity, have the group identify their current situation (spaceship) they are leaving behind - - metaphorically this ship represents all that they no longer need and/or those things that no longer serve them. Also identify the new destination ("rescue ship") and it's qualities. What do the squares on the ground represent? What does the tape around the ankles represent?

### **Variations**

1. Supply the group with a limited amount of time to complete the task (example: 20 minutes).
2. Require two or three people to close their eyes for part or all of the activity.
3. Divide the team in half. One group starts on one side and one group starts on the other. The groups must switch places before time runs out. Will they work together or against each other?

4. Do this activity in a room that you can turn the lights off so as to make it completely dark (facilitator has a flash light to look for rule violations). Warn the group that you might turn the lights off during the activity. If you do turn the lights off, keep them off for a short time (5 to 10 seconds).

## **Activity 6: Minefield**

**Group Size:** 2 – 50

**Time:** 15 – 30 minutes (without debrief)

**Set Up Time:** 5 minutes

**Props:** 70 feet of rope or tape to create a playing area, 50 – 100 objects that act as obstacles/landmines (ex. Tennis balls, pieces of foam, mousetraps, etc.)

### **Game Objective**

Travel through the minefield with the help of your partner.

### **Skills Developed**

Trust, Communication, Planning

### **Set Up / Preparation**

1. Create the playing area. For a group size of 12 people start by creating a 10 ft x 10 ft square on the ground out of rope or tape (larger groups need a larger size playing area). On the “start” and “finish” sides of the box create “doors” using 6-inch long strips of tape - - these short pieces of tape need to be two feet apart (refer to diagram below).
2. Create obstacles (land mines) in the playing area by filling the square (playing area) with tennis balls or pieces of paper, etc.. The more obstacles you add the harder the game will be. Adding approximately 30 obstacles into the square will provide a medium level of difficulty for most groups. Spread out the obstacles in such a way that there are no straight pathways through the minefield.

NOTE: During the actual activity, you may find the group has located an easy pathway which you did not see until the game has started. I allow myself the option to change/adjust the minefield playing area midstream by rearranging the obstacles. If the group challenges me on this I usually say I’m attempting to mimic real life in that things change and you can either adapt or complain.

### **Presenting the Challenge**

1. Have everyone find a partner and stand on the “start” side of the square playing area.
2. Presentation Script: “Your challenge is to travel through the playing area to the other side of the square. You’ll be working in teams of two. At the beginning of the game everyone will start behind the line on the “start” side of the square. Teams of two (partners) can work independently of other teams. When traveling through the playing area (minefield) your eyes must be closed which means your partner must coach you / guide you (verbally) through the minefield helping you avoid the obstacles (land mines).

When the first person in your partnership makes it to the other side he/she can open his/her eyes and the rolls switch - - now that person becomes the coach and guides his/her partner (verbally) through the playing area from the start side to the end side.”

### **Rules**

1. No running or fast moving.
2. People must stand behind the start line or the end line or be walking through the playing area (minefield). No one is allowed on the sides of the playing area.
3. Anyone inside the playing area must have their eyes closed.
4. Multiple people can be inside the playing area.
5. You must enter and exit through one of the “doors”.
6. If anyone touches a land mine or the perimeter of the playing area, they must return to the start side and try again.
7. The participants may not alter the playing area but the facilitator can.
8. Violation of a rule may result in a penalty.

### **Safety Warning**

1. The playing area must be safe because people will be walking around with their eyes closed. Make sure the playing area is level and flat.
2. If someone needs to open their eyes to feel safe that’s fine.

### **Facilitator Notes**

1. If you have an uneven number of people just create one team of 3 (Person A, Person B, Person C). Person A goes through the playing area first then coaches Person B through who coaches Person C through.
2. I’ve led this activity effectively with groups as small as 4 people and as large as 80. The great thing about this activity is people work in pairs and can be somewhat independent of the other people.
3. When the activity is in full motion, there is lots of talking and things can get loud (larger groups get louder). With large groups it can feel somewhat chaotic (mostly because of the noise) because multiple teams are working simultaneously.
4. This is a wonderful activity to practice coaching (coaching others and being coached). Every moment of this activity provides ample opportunity to practice clear and precise communication.
5. Once the first person makes it to the other side he/she will typically only coach his/her partner through. However, that same person may choose guide people other than his/her partner. I’ve deliberately provided rules that allow teams/people to collaborate.

### **Debriefing Suggestions**

Land mines (obstacles) are metaphoric problems the group faces either personally or as a team. They are everywhere in life (personal & public). Some land mines are big and some are small - - they all do damage when we hit them. In this exercise, there are lots of land mines separating the participants from their desired outcomes (goals).

Life is full of obstacles. Some people allow obstacles to prevent them from succeeding. Others keep running into the obstacles. What are the obstacles in your life (in your team) that you must recognize and then avoid?

We can go through life trying to avoid the obstacles but it's easier when we have help. Where do you get help in real life? Are you effective at asking for help? How are you at receiving help? How do you know? Are you good at giving help? How do you know?

### **Variations**

1. Provide the team with a time limitation. For example, the team has 20 minutes to get the entire team from one side to the other.
2. At the beginning of the activity before the group actually starts (but after you've supplied the instructions), warn them that a "communication breakdown" may occur during the activity. If this happens, people will not be allowed to communicate verbally. Don't tell them how long it will last (make it last no more than 60 seconds). This will allow people to plan (or not) for this possibility.
3. Provide each person with one index card and have everyone write down an attribute they bring to the team on their card. These cards will then be scattered (writing side down) throughout the playing area (inside the square) among the obstacles. During the game each person is to pick up ONE card while traveling through the playing area (while remaining sightless) and carry it to the other side. The metaphor here is that everyone brings talents and skills to the team and yet we must work together to bring forth and utilize these talents.
4. Divide the team in half. Group A will start on one side of the playing area and Group B will start on the other side of the playing area. Follow the basic set of rules with this one twist - - Group A must move to where Group B is and Group B must move to where Group A is (teams moving in opposite directions). Make sure people in Group A partner up with each other and people in Group B partner up with each other. Hopefully the two groups will realize that the game runs better if they collaborate.
5. In the basic setup of this game I provide two "doors" - - one at the start and one at the end of the playing area. For larger groups you may need to not only create a larger playing area (square) you may need to add more doors.
6. To take this activity to an entirely new level use mousetraps in the minefield and have participants walk through with bare feet.

## 11.2. Appendix B: Results of the Literature Review

### **Keywords found in the title:**

1. An Experiential Learning Approach to Develop Leadership Competencies in Engineering and Technology Students [82]
2. Leadership and Teamwork Education for Engineering and Technology Students: An Experiential Learning and Community Service Approach [83]

### **Keywords found anywhere in the article:**

1. Dramaturgical Teaching in the Leadership Classroom [91]
2. Experiential Learning And Management Education: Empirical Research And Implications [87]
3. Experiential learning approach for requirements engineering education [89]
4. Experiential learning for leadership and sustainability at IBM and HSBC [84]
5. Experiential Learning In An Organizational Leadership Program [90]
6. From Experiential Learning to Aesthetic Knowing - The Arts in Leadership Development [92]
7. Improving the Communication Skills of IS Developers during Requirements Elicitation Using Experiential Learning [88]
8. Know thyself Coaching for leadership using Kolb's Experiential Learning Theory [93]
9. Leadership Development through Experiential Learning [85]
10. School leaders' perspectives on leadership learning: The case for informal and experiential learning [94]
11. Teaching and Learning: Using Experiential Learning and Reflection for Leadership Education [86]
12. The impacts of Experiential Learning on leadership identity in female college graduates [95]

## 11.3. Appendix C: Release Form



### Photograph & Video Release Form

I hereby grant permission to the rights of my image, likeness and sound of my voice as recorded on audio or video tape without payment or any other consideration. I understand that my image may be edited, copied, exhibited, published or distributed and waive the right to inspect or approve the finished product wherein my likeness appears. Additionally, I waive any right to royalties or other compensation arising or related to the use of my image or recording. I also understand that this material may be used in diverse educational settings within an unrestricted geographic area.

Photographic, audio or video recordings may be used for the following purposes:

- educational videos
- educational presentations or courses
- on-line educational courses
- informational presentations
- conference presentations

By signing this release I understand this permission signifies that photographic or video recordings of me may be electronically displayed via the Internet or in the public educational setting.

I will be consulted about the use of the photographs or video recording for any purpose other than those listed above.

There is no time limit on the validity of this release nor is there any geographic limitation on where these materials may be distributed.

This release applies to photographic, audio or video recordings collected as part of the sessions listed on this document only.

By signing this form I acknowledge that I have completely read and fully understand the above release and agree to be bound thereby. I hereby release any and all claims against any person or organization utilizing this material for educational purposes.

Full Name \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_

Zip Code \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

## 11.4. Appendix D: Activity Evaluation Form

### Training Evaluation & Feedback

course title & date .....

	a lot	some	a little	none	specific highlights and/or suggested improvements?
<b>Enjoyment:</b> Did I enjoy the course?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>New knowledge and ideas:</b> Did I learn what I needed to, and did I get some new ideas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Applying the learning:</b> Will I use the information and ideas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Effect on results:</b> Do I think that the ideas and information will improve my effectiveness and my results?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Any other comments?**

**Name**

.....

© Alan Chapman. A free resource from [www.businessballs.com](http://www.businessballs.com). Not to be sold or published.

## 11.5. Appendix E: Adapted Activity Evaluation Form

Carnegie Mellon University - Silicon Valley

### Activity Evaluation & Feedback

Leadership Group  
Activity - 11/10/2015

	a lot	some	a little	none	specific highlights and/or suggested improvements?
<b>Enjoyment:</b> Did I enjoy the activity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>New knowledge and ideas:</b> Did I learn what I needed to, and did I get some new ideas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Applying the learning:</b> Will I use the information and ideas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Effect on results:</b> Do I think that the ideas and information will improve my effectiveness and my results as a leader?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Skill:</b> How much did I practice of Communication?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Skill:</b> How much did I practice of Team Work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Skill:</b> How much did I practice of Problem Solving?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Skill:</b> How much did I practice of Group Dynamics?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Any other suggestions?**

Based on "Quick Training Evaluation and Feedback Form" from © Alan Chapman. A free resource from [www.businessballs.com](http://www.businessballs.com).



*"Example is not the  
main thing in  
influencing others. It is  
the only thing."*

*Albert Schweitzer*

## 12. About the Authors

---



### **Taciano Moraes**

Author

MS Student of Software Management at Carnegie Mellon University - Silicon Valley with full scholarship from the Government of Brazil. He has 8 years of experience in Analysis, Development, and Testing of web systems and sites, and trainings in ITIL, Communication and Organizational Psychology.

He has interned as a Product Manager at Coupa, one of the latest unicorns of Silicon Valley; worked on an enormous Distance Learning platform for the Brazilian Ministry of Education; started two open source projects; and worked as volunteer for 3 non-profit institutions.

He was the curator and organizer of 8 TEDx events, coordinating and leading teams of around 50 people. Thanks to his dedication, he was selected by TED for a full scholarship in TEDxSummit - World Meeting of TEDx organizers - that took place in Doha, Qatar.

He also has parallel projects in areas such as Photography, Music and Filming (being semi-finalist in a short movies festival), and interest in Psychology, Communication, Web Marketing and Entrepreneurship.

## **Sheryl Root**

Advisor



Faculty member at Carnegie Mellon Silicon Valley. Currently, she has her business, RootAnalysis, which is a consulting firm in business strategy and marketing. Before joining the faculty, she was Director, Marketing Services at Applied Materials and previously was with HP for 20 years having served as director of Business Strategy, director of Marketing Operations for Services, Director of the Software Initiative and Manager of Unix environments. She led internal teams of consultants in advancing software engineering and business management process practices within Hewlett-Packard worldwide, specializing in the area of software.

Sheryl completed her undergraduate studies at the University of California and obtained her master's degree in business from Stanford University. She is on the Board of Advisors for the Stanford Business School Sloan Program and is a member of the board for WITI (Women in Technology, International).



*"Small minds discuss  
people; average minds  
discuss events; great  
minds discuss ideas."*

*Henry Thomas Buckle*