

The Effectiveness of an Interactive Training Program in Developing a Set of Non-Cognitive Skills in Students at University of Petra

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Abstract

This study aimed to investigate the effectiveness of interactive training programs in developing a set of non-cognitive skills in students at the University of Petra. Furthermore, it sought to examine the impact of the sex, academic year, and university major variables on developing these skills in students who underwent the training program, as well as whether a correlation exists between the GPA of students in the experimental group and how they acquired these non-cognitive skills. The study focused on the following six non-cognitive skills: (a) locus of control; (b) planning; (c) empathy; (d) self-confidence; (e) growth mindset; and (f) grit. The study sample was randomly distributed into three groups: the first (Group A) attended an interactive training program; the second (B) attended a training course using a traditional teaching strategy; while the third (C) did not attend any programs whatsoever. The researchers have designed an interactive training program and a questionnaire to measure the sample's non-cognitive skills on all six dimensions. The results indicate statistically significant differences between the different teaching methods used on all three groups (A, B, and C) in the overall test, as well as on three dimensions of empathy, growth mindset, and grit in favor of the experimental group (A). Additionally, findings have revealed no significant differences in the extent to which students in the experimental group (A) have acquired non-cognitive skills on the variables of sex, academic year, and university major. Moreover, the study did not show significant correlation between the extent to which students acquired these non-cognitive skills and their GPAs.

Keywords: non cognitive skills, thinking skills, grit, mindset, empathy

1. Introduction

1.1 Introducing the Problem

By the dawning of the 21st century, the world underwent a rapid growth in knowledge embodied in an information technology revolution, where technology came to occupy an assured position in all aspects of life, including education, medicine, agriculture, etc. This has posed a new challenge for humans' skills and capabilities as traditional teaching methods (which emphasize on teaching students to read and write, do math, or possess academic competence) are no longer sufficient for achieving success, whether in students' career path or practical life (Saavedra & Opfer, 2012). There now is a dire need to help individuals acquire and develop a number of non-cognitive competencies and skills, or what may be referred to as "The Keys to Success", which would enable them to face such challenges. In the upcoming decades, global economics are expected to double, which will offer various and new vacancies where it is necessary for an individual to possess certain skills; work in the future is expected to require proficiency, initiation, determination, decisiveness, and the ability to adapt. Without a doubt, such challenges call for the use of new methods of learning – methods that largely differ from those now used inside the classroom. The world of tomorrow needs teachers to focus on helping students acquire a number of competencies or skills, to develop their curiosity, self-control, self-motivation, teamwork, and the ability to overcome cultural and linguistic barriers (Roberts, 2009).

Therefore, it is clear that there exists a growing worldwide movement in hopes of exploring these "non-cognitive" competencies, which consist of characteristics, social skills, attitudes, behaviors, and intrapersonal resources, which individuals of high achievement depend on to reach success (Shechtman et al., 2013). This has caught researchers' attention in the past decade, leading them to study these non-cognitive competencies and stress on the importance of making students acquire them (Dweck, 2007a; Chang, 2014). These studies were based on the

careful examination of patterns of failure and success. Moreover, millions of parents, teachers, and students have emphasized on the importance of these skills, and have pointed out the inconsistencies between what school curriculum offer at the current time, and what students will need to face the challenges of the current century (Roberts, 2009).

Undoubtedly, this interest in such skills can help improve the academic performance of students, and is a crucial component of the social mobility. Furthermore, it offers students better opportunities in life, and helps elevate the mental health of children by assisting them in managing the setbacks and stress of our exceedingly modern lifestyles. This may also help in meeting the demands of employers by producing high quality future workers who possess skills necessary for employment. In addition to the positive impact this may have on society as a whole, this assists individuals in society in better understanding and coping with people around them (Roberts, 2009; Chang, 2014).

It is up to the educational community to design suitable learning environments and implement new teaching approaches, so to reinforce these non-cognitive competencies or skills in students. These will allow students to understand their surroundings more clearly, practice effective problem-solving, and efficiently handle emerging ideas that move humanity forward with creativity, so to help societies progress and face 21st century challenges (Shechtman et al., 2013). This study will focus on the following non-cognitive competencies [or skills]: (a) locus of control; (b) planning for the future and setting goals; (c) empathy; (d) self-confidence; (e) growth mindset; and (f) grit.

Grit (as well as tenacity, and perseverance) are considered to be non-cognitive key factors which an individual must acquire in order to do his or her best in achieving long-term and high-level goals and resist challenges and obstacles he or she may face whether during education years or later on (Shechtman et al., 2013). Duckworth et al., (2007) defines Grit as “Tenacity and enthusiasm required achieving long-term goals”. This is done by ensuring that the individual works persistently, with high efforts and focus for extended periods of time despite setbacks and obstacles that may stand in his or her way. In other words, it is not to surrender or withdraw, nor to fear failure; but rather to proceed, follow up, obtain experiences from previous failures, and not to quit the task at hand simply because one prefers a refreshing change, or because setbacks or obstacles may stand in the way of success.

Furthermore, (Duckworth et al., 2007) asserted that grit (as well as tenacity and perseverance) are not new concepts, as Galton (1869) collected information from a significant number of successful individuals of all times (stretching on a time period of 100 years or more), and concluded that ability alone is not sufficient for achieving success. The individual may also need zeal and hard work. In other words, successful individuals were made rather than born; and are usually very typical people who achieved success in their lives by being motivated and willing to accomplish, with a love for learning, challenging, and overcoming obstacles. These are seen as the most crucial skills with which one may provide students (Roberts, 2009).

Grit may be reinforced in students through focusing on setting valuable goals which are worthy of the effort put into achieving them. Furthermore, these goals must be within the range of students’ abilities, and should neither be too easy nor too difficult. It should be aided by a supportive and strict surrounding environment, in a classroom run by fairness, respect, and high expectations, where more focus is put into effort rather than ability. This environment must also provide students with necessary resources such as materials, teachers, and time so to help students overcome setbacks which they may face when seeking to achieve such goals. Named setbacks include distraction, boredom, lack of resources, and untimely circumstances (Shechtman et al., 2013; Chang, 2014).

Since grit and zeal push the individual to challenge setbacks in hopes of achieving his or her goals, it would be essential to benefit from students’ psychological sources (such as their academic mindsets, effortful control, strategies, and tactics). It should be stated that different socio-cultural contexts play a vital role in developing grit since they affect what students appreciate, which of these preferences they should seek to accomplish, the type of challenges they may face, and the type of resources accessible to them. Studies have shown that students from highly underprivileged backgrounds face a substantial amount of pressure, and receive very limited social support, which weakens their tenacity toward accomplishing a wide array of goals (Hanford, 2012; Shechtman et al., 2013). Moreover, there is a high price for grit (and a number of potential risks) since tenacity and perseverance may not always be effective in overcoming obstacles. This is particularly true when the set goals are unimportant or unsuitable for the students, which causes them to feel anxious, distracted, and mentally stressed, and by that negatively impacting their ability to recall and learn, as well as damaging their mental health (Shechtman et al., 2013). Additionally, an individual may not be able to develop grit (or tenacity and

perseverance) due to personal factors (whether external or internal), such as lethargy, including different life appeals which are tricky to resist. However, grit may be developed through practical training and conceptual teaching, providing the individual the opportunity to discover the importance of grit and to foster his or her ability to overcome setbacks, and boosting his or her motivation and aspirations (Glei, 2011; Chang, 2014).

Numerous societies uphold the value of talent, and many may assume that those who possess high intelligence hold the keys of success exclusively. Nevertheless, more recent studies in this field, such as those conducted by Dweck and her colleagues, show that success does not solely depend on ability or intelligence, but also on the constant development of abilities or talents, and that the brain has the capacity expand further in all phases of life (Dweck, 2007; Yeager & Dweck, 2012).

Dweck is considered to be a pioneer in this field, for her employment of the new term “Mindset”, which refers to the beliefs an individual may hold regarding him/herself, as well as his or her basic qualifications. Furthermore, Dweck called attention to two basic types of mindsets – “growth” and “fixed”. Individuals with a fixed mindset (theory of inherited intelligence) believe that their qualifications of intelligence, creativity, or talent are all stable and fixed. On the other hand, individuals with a growth mindset (that intelligence develops) believe that their abilities can further progress through hard and steady work, that these abilities are only a starting point, and that the recipe to success requires effort, learning, and tenacity (Dweck, 2010a; Blackwell et al., 2007).

Individuals with a fixed mindset would rather not exert any extended efforts. Furthermore, they view challenges and the exertion of efforts as a threat to their egos, causing them to lose their self-confidence when the tasks assigned are too difficult to fulfill. In addition, they usually do not acknowledge the need to learn and expand their knowledge since they are convinced that they already possess great intelligence – hindering them from expanding their capabilities and improving themselves, while pushing them maintain a shallow facade of high intelligence and perfection (Dweck, 2007b).

Alternatively, students with a growth mindset may feel that learning is more important than obtaining high scores, or may believe that hard work is of utmost significance and that *‘the more one works, the better one gets’*. They may thus seek to choose tasks that require a sense of challenge, and will attempt to face setbacks and deficiencies through changing the strategies they are using to approach the problem or given task (Dweck, 2007b).

In addition, students who believe that it is possible to improve an individual’s abilities are more likely to score higher on more difficult (or challenging) courses, such as mathematics, and exhibit lower levels of stress and violent behaviour. Furthermore, their academic performance tends to reflect great improvement (Yeager & Dweck, 2012).

Furthermore, Dweck implies that teachers could push students into a fixed mindset when complementing their personal characteristics such as natural intelligence, and by placing emphasis on skill rather than performance. Alternatively, when teachers come to appreciate the efforts exerted by their students, or the strategies students may put into use to accomplish their goals, they help shape their growth mindset. This teaches students to learn from their mistakes and challenge themselves to achieve their aims (Mueller & Dweck, 1998).

To help provide students with a classroom environment that encourages them to have a growth mindset, Dweck and Blackwell have designed and enhanced classroom practices that teachers may use, including:

- 1) Setting high expectations and challenging one’s students, thus making it known to students that they possess the necessary ability to meet these expectations;
- 2) Setting up a classroom environment that recognizes challenges, exerted efforts, and learning more than it would recognize a quest for perfection.
- 3) Providing students with feedback that focuses on processes (which are aspects students have control over), rather than their personal abilities, in addition to avoiding reinforcing student’s intelligence levels, but alternatively focusing on the tasks they perform to achieve success.
- 4) Ensuring that students have a clear understanding of mental flexibility, and that they understand how brains grow by learning and the exertion of efforts (Dweck, 2010b).

The concept of the locus of control, developed by Rotter, has gained massive attention from researchers, and has been employed to explain individual differences in students’ behavior and cognition of environmental situations.

According to Rotter (1966), the locus of control of an individual is how he or she acknowledges the link between his or her behavior, and what consequences this behavior may hold. Rotter draws a line between two types of individuals. The first type are those with internal control – who attribute each and every consequence and

outcome of their work (whether of success or failure) to themselves, how high or low their will power had been, the level of their own abilities, and their personal internal characteristics. These individuals are known to be confident, ambitious, and high achievers who can take responsibility and handle both rigidity and flexibility. The second type are those with external control, who attributed everything in their lives (whether positive or negative) to external factors and circumstances such as luck, chance, and power. This type often lacks self-confidence, has low expectations for success, and is self-centered.

Empathy is a psychological and social variable which plays a crucial role in the lives of individuals (Al-Obeidi, 2011). It refers to one's ability to share with others and understand their mental or emotional state. In other words, it's to '*put yourself in someone else's shoes*' (English proverb).

Empathy consists of two components: emotional and action. The emotional component refers to feeling the misfortunes and obstacles one has experienced in life, whereas the action component refers to supporting and encouraging someone to endure what he or she has gone through (Al-obeidi, 2011). Empathy is a way of distinguishing other peoples' feelings and pinpointing the reasons behind them, as well as being able to share one's emotional experience without becoming part of it. Researchers assert that empathy is an effective communication skill and ability to teach and learn; and that it has received only little attention in previous research (Ioannidou & Konstantikaki, 2008). Moreover, empathy is not identical nor more intense than sympathy; rather, it is the ability to listen to (and cogitate on) others in hopes of familiarizing one's self with their thoughts and feelings, and thus being able to offer help to them (Ernst, 2001).

Philosophers and educators have long emphasized on the importance of self-confidence as one of the key skills that reinforce motivation in individuals and influence their social interactions and feelings; additionally, it helps individuals who lack will power (Bénabou & Tirole, 2005). Self-confidence is considered to be one of most significant features an individual could acquire from the social environment in which he/she lives in and interacts with (At-ta'i, 2007). Furthermore, it helps individuals achieve psychological compatibility and gives them the ability to overcome hardships and work hard to achieve goals and desired outcomes (Gharghout, 2016). Individuals with self-confidence trust others and are more interested in initiating work while encouraging others to tag along, and are also quite willing to listen to others' problems. Such individuals are better at time management, and have higher levels of self-acceptance while maintaining the ability to reflect upon their actions, and never experience hopelessness or despair – they place high value on achievement, and thus are more capable of occupying high positions in society.

1.2 Literature Review

Researchers have shown great interest in non-cognitive skills or competencies in relation to a number of different variables. For example, Al-Obeidi (2011) investigated the relationship between empathy and violent behavior in a sample of middle school students in Baghdad – her study included 218 male and female students, on whom she implemented the Empathy Scale and the Violent Behavior Scale. Her findings indicated that the sample had a tendency to empathize, and that females display more empathy than males, in addition to a negative correlation between empathy and violent behavior.

Moreover, Duckworth et al., (2007) conducted a series of studies on grit and its importance in achieving (long term) goals, the findings indicated that grit accounted for 4% of variance in successfully achieving desired outcomes. Furthermore, the findings of this series of studies indicated that grit is not positively correlated with IQ, but rather with the Big Five Conscientiousness; in other words, it means that achieving difficult goals does not depend on talent, but rather on continuous hard work. In addition, study results indicated that older students had stronger grit, and individuals with more grit are less likely to seek changing their careers. Also, students with more grit had higher GPA compared to their peers. Recently, Gharghout (2016) conducted a study on the relationship between self-confidence and achievement motivation in a sample of university students at Eloued University. The results pointed toward a correlation between self-confidence and achievement motivation, but no statistically significant differences on the variable of sex in relation to self-confidence.

Furthermore, in her study, At-Ta'i (2007) sought to investigate the level of self confidence in social studies students at the University of Mosul and how it relates to academic achievement motivation. Her study indicated that students had a good level of self-confidence, and that self-confidence was correlated with academic achievement motivation, but that there were no statistically significant differences in self-confidence in relation to any of the three variables of sex, academic year, and university major.

In another study on internal and external locus of control by Judge and Bono (2001) which aimed to investigate the relationship between the four features (Self-Esteem, Self-Efficacy, Locus of Control, and Emotional Stability), and Job Satisfaction and Job Performance, findings revealed a correlation between the aforementioned

four features and the latter. Likewise, Chang (2014) investigated the importance of non-cognitive skills in predicting the performance of university students in their freshmen year and up until graduation, and found that academic performance was the most suitable indicator of student perseverance for graduation. His findings asserted that students' sex, high-school scores, and scores on the perseverance test were indicators of their GPA during their freshmen year.

1.3 Purpose of the Study

This study aims to achieve the following: (1) build and design training programs that enable students to develop a set of non-cognitive skills that may assist them in solving problems they face whether in daily or academic life; and (2) investigate the effect of training programs in helping a sample of students (in the Faculty of Arts at University of Petra) acquire a set of non-cognitive skills.

1.4 Significance of the Study

The significance of the study lies in that it seeks to develop a training program which should include a set of non-cognitive skills that university students currently need in order to face challenges and rapid changes in the world. Furthermore, the study is significant in that it aims to investigate the extent to which students at University of Petra possess such skills, which can positively impact their performance and ability to face problems and achieve academic or life-related success.

The significance of the study may be argued as follows:

- (a) It seeks to provide a training program that fosters a set of non-cognitive skills in students, and this training program may be used by interested individuals in enriching university students.
- (b) It seeks to assess the effectiveness of the aforementioned program in helping students acquire these non-cognitive skills.
- (c) It paves the way for future studies that researchers ought to conduct to tackle the effectiveness of training students to foster their non-cognitive skills in different academic levels.

1.5 Problem of the Study

The problem of this current study is marked by its attempt at exploring the effectiveness of training programs in developing and reinforcing a set of non-cognitive skills in undergraduates. This is of particular relevance since educational literature have emphasized the importance of the training programs in enabling students to acquire non-cognitive skills for what benefits they hold for the individual as well as society. Students with grit, a growth mindset, empathy, the ability to plan, internal control, and self-confidence possess what it takes to solve problems creatively, and have higher levels of motivation and are more aware of themselves and their abilities.

Since these non-cognitive skills are of crucial importance, and since they may be developed through training, the researchers have decided to tackle and investigate this topic, especially due to the fact that few studies (as far as the researchers are informed on a local level) have tackled skills and characteristics such as the growth mindset, grit and empathy. Thus, this study could be thought of as a preliminary paper that aims to familiarize educators with the importance of the aforementioned skills, and assist researchers in conducting similar and furthering studies that explore other strategies for developing these skills.

1.6 Operational Definitions

- **Students with internal locus of control** are those who believe that their success or failure at school is entirely up to them and what variety of features, skills, or experiences they possess. As a result, such students assume full responsibility for whether they fail or pass any given course.
- **Students with external locus of control** are those who believe that their success or failure at school does not depend on them, but is rather affected by external factors which they cannot control. Therefore, such students believe they are not responsible for whether they fail or pass any given course.
- **Planning to achieve goals** is an individual's ability to control him/herself or others, and manage time in order to achieve desired goals.
- **Empathy** is the ability to share the positive and/or negative feelings and emotions of another person.
- **Growth Mindset** belongs to a person who believes that abilities can keep on growing through hard and consistent work, and that success comes as a result of hard work, learning, and perseverance.
- **Fixed Mindset** belongs to a person who believes that intelligence, creativity, and talents are specific and fixed features which do not grow.

- **Grit** is to work hard, exert great efforts, and show interest for a an extended period of time without giving up or quitting, and without abandoning a task for a simple desire for change or because the task may be too difficult, but rather to maintain steadfastness and gaining experiences from previous failures.
- **Self Confidence** is an individual's ability to respond in ways compatible with the stimulants facing him/her, and realizing his/her acceptance of others and his/her own self to a high extent.

1.7 Study Questions

- 1) What is the impact of interactive training programs on developing a set of non-cognitive skills in university students as opposed to using traditional methods?
- 2) Are there any differences in the extent to which university students in the experimental group acquire this set of non-cognitive skills in relation to (a) sex, (b) academic year/level, and (c) and university major?
- 3) Is there a correlation between the extent to which students in the experimental group possess non-cognitive skills and their GPA?

1.8 Study Population

A group of 174 male and female students from different departments at the Faculty of Arts (and a number of other faculties) at University of Petra participated in this study during the first semester of the academic year 2015/2016. Students grouped by major were as follows: 46 majoring in English Literature, 44 in Journalism, 45 in Educational Sciences, and 31 in other majors. Of these, 74 were freshmen, 65 sophomores, 17 juniors, and 18 seniors. Furthermore, 36 of the participants were male and 138 females. Participants in the study sample have been randomly distributed into three groups, showing that 57 were experimental, 58 were traditional, and 59 students were in the control group.

2. Method

A semi-experimental approach has been used in this study so to control the independent variable, which was training a group of individuals in non-cognitive skills through a training program. The first group in the study sample attended a training program; while the second was taught these skills with the use of traditional methods; whereas the third group did not undergo any courses whatsoever.

2.1 Tools

- 1) **Training Program:** a training program has been designed and implemented to help students acquire a set of non-cognitive skills through fostering these skills in students by interactive training that largely depend on brainstorming, discussion, dialogue, team work, streaming of and illustrative movies.
- 2) **Non-Cognitive Skills Scale:** a Literature Review has been conducted with the intention of designing a questionnaire to measure the extent to which students possess this set of non-cognitive skills. The questionnaire designed by the researchers consisted of 54 items of which: 6 for measuring growth mindset, 12 for the locus of control, 12 for empathy, 12 for grit, 12 for self-confidence, and finally 13 for planning and setting of goals . Each item had two-choice answers, where giving the first answer indicated that an individual possess this particular skill, and the second answer indicated that he did not.

The participants were placed into three groups randomly for the purpose of the study, as shown below:

Group A: This group has been taught a set of non-cognitive skills, which consisted of the following: internal locus of control, grit, planning and setting of goals, growth mindset, self-confidence, and empathy. Students have acquired these skills by attending an obligatory faculty course titled “Teaching Thinking”, where they engaged in a learning process based on interactive tasks. This has enabled students to become more competent in creatively solving problems they may face at university or in daily life. These non-cognitive skills have been delivered to the students through interactive activities they perform individually or in groups; where the main concepts of each activity were presented through streaming of short films or performing a variety of planned activities. There were no text books or written passages for the students to study from. The students were assessed by their performance in practical and interactive projects, and the course had no pen-and-paper tests or exams.

Group B: This group was taught a set of non-cognitive skills, which included internal locus of control, grit, planning and setting of goals, growth mindset, self-confidence, and empathy through an obligatory faculty course titled “Teaching Thinking”. Group B engaged in a learning process based on a traditional instruction method with the use of lecturing, discussion, and dialogue. The students in this group were assigned a reference text book, and were assessed through pen-and-paper examinations which contained objective and essay-like questions.

Group C: This group was set as a control group. No participants in group C underwent or attending the aforementioned courses.

2.2 Validity and Reliability of the Scale

The questionnaire was reviewed by a group of experts to confirm its validity and the suitability of the items in measuring the level of non-cognitive skills in students. Moreover, Cronbach's alpha was used to measure the validity of the research tool, which gave a reliability coefficient of $\alpha = 0.85$ for the overall Non-Cognitive Skills Scale, and that of 0.60 for the growth mindset, 0.72 for the locus of control, 0.74 for empathy, 0.75 for grit, 0.81 for self-confidence, and 0.66 for planning to achieve goals. These values are acceptable for research purposes.

3. Results

To answer the first question "What is the impact of interactive training programs on developing a set of non-cognitive skills in university students as opposed to using traditional methods?" the means and standard deviations of students' scores on the overall non-cognitive skills scale designed for the purpose of this study were calculated, as well as on all six dimensions of the three groups. Table 1 illustrates these results.

Table 1. Mean and standard deviation values of the study sample's scores on the overall scale and its six dimensions in three separate groups

	Locus of Control		Planning		Empathy		Self Confidence		Growth Mindset		Grit		total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Experimental Group A	83.6	9.5	78.9	10.4	89.5	5.9	78.9	8.8	92.9	12.2	89	8.2	84.9	5.0
Traditional Group (B)	82.0	8.5	77.7	10.6	83.5	10.4	77	11.2	83.6	14.2	81.4	12.3	80.6	6.5
Control Group C	82.9	9.2	78.8	10.2	85.3	9.6	78.3	10.2	88.2	13.9	84.9	11.5	82.1	6.5
Total	82.9	9.2	78.8	10.2	85.3	9.6	78.3	10.2	88.2	13.9	84.9	11.5	82.5	6.3
F-value	0.39		0.5		9.1		0.64		6.99		6.8		7.5	
Sig.	0.68		0.59		0.000		0.53		0.001		0.001		0.001	

Table 1 clearly indicates that Group A, which had undergone the training program, had the highest mean on the overall test (84.9), followed by the Group C, the control group which underwent no training programs whatsoever (82.1), whereas students in Group B had the lowest mean of all (80.6). On the six dimensions of the scale, Group A had the highest means on all dimensions, compared to those in Groups B and C.

To establish whether any statistical significance exists, F-values were calculated for the overall scale and for all six dimensions therein, as shown at the bottom of Table (1). The F-values indicate statistically significant differences between the different methods used on Groups A-C in the overall test, and on three dimensions: empathy, growth mindset, and grit.

To explain these significant differences, the Post Hoc Comparisons were calculated using Tukey's Test. The results indicated a statistically significance difference between methods used in Group A and B, in favor of Group A; in addition to a statistically significant difference between methods used in Group B and Group C (the control group), in favor of Group C.

Also, the percentages of students' scores on the overall scale in all three methods were calculated. These percentages were sorted into three levels: high, moderate, low. Students were distributed into these three different levels according to the following:

- If students had a percentage between 80%-100%, they were said to have high levels of non-cognitive skills.
- If students had a percentage between 60%-79%, they were said to have moderate levels of non-cognitive skills.
- If students had a percentage lower than 60%, they were said to have low levels of non-cognitive skills.

Table 2 demonstrates the distribution of the study samples' scores on the questionnaire.

Table 2. The distribution of the study sample into three groups based on their performance level on the non-cognitive performance scale (high, medium, and low)

	High	Moderate	Low
	80%-100% (N)	60%-79% (N)	Below 60% (N)
Experimental Group (A)	80.7 % (46)	19.3 % (11)	-
Traditional Group (B)	62.1 % (36)	36.2 % (21)	1.7 % (1)
Control Group (C)	59.3 % (35)	40.7 % (24)	-

The results shown in Table 2 indicate that students who had a high level of non-cognitive skills were those in Group A (80.7%), followed by Group B (62.1%), and finally the control group, Group C (with a percentage of 59.3%).

To answer the second question “Are there any differences in the extent to which university students in the experimental group acquire this set of non-cognitive skills in relation to (a) sex, (b) academic year/level, and (c) and university major”?

The means and standard deviations of students’ scores on the overall non-cognitive skills scale as well as on all six dimensions on the sex variable were calculated for experimental group. Results are shown in Table 3.

Table 3. Mean and standard deviation values of the experimental group’s scores on the sex variable on the overall scale and its six dimensions

	Locus of Control		Planning		Empathy		Self Confidence		Growth Mindset		grit		total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Male (12)	84.7	6.7	80.2	9.0	88.2	5.6	79.2	10.5	89.5	17.4	89.1	9.0	84.8	4.1
Female (45)	83.3	10.1	78.5	10.8	89.9	6.0	78.9	3.4	93.9	10.4	89.0	8.0	85.0	5.3
t	0.448		0.498		-0.892		0.096		-1.090		0.048		-0.090	
sig	0.656		0.621		0.376		0.924		0.280		0.962		0.928	

Results in Table 3 indicate that differences between means of male and female students were very small, with slightly higher mean scores in female students. In regards to the scale’s dimension, findings have shown that mean values of male students were higher compared to female students in experimental group in the following dimensions: locus of control, planning and setting of goals, self-confidence, and grit; whereas the mean scores of females were higher in empathy and growth mindset, as well as on the overall scale. To establish whether these differences were statistically significant, their t-value was calculated.

The t-values do not point toward any statistically significant differences on the mean values of male and female students, whether on the overall scale or on each of the six dimensions.

To determine whether students differed in their levels of these non-cognitive skills in relation to their academic year, the means and standard deviations of students’ scores in experimental group were calculated as show in Table 4, on the variable of Academic Year.

Table 4. Mean and standard deviation values of study experimental group’s scores on the academic year variable

	Locus of Control		Planning		Empathy		Self Confidence		Growth Mindset		Grit		total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Freshman 27	80.7	11.1	76.2	11.3	90.4	5.9	76.9	7.3	94.4	8.7	89.7	7.0	83.9	4.8
Sophomore 19	86.0	7.9	79.8	8.4	89.3	5.1	81.8	8.2	95.2	11.9	88.5	8.8	86.2	4.5
Junior 5	88.3	3.5	81.7	12.4	85.8	10.0	80.8	10.9	85.0	18.1	82.3	11.1	84.8	7.5
Senior 6	85.4	6.3	85.4	8.6	89.6	4.4	77.8	14.1	86.1	18.8	92.9	7.1	86.1	5.5
F-value	1.79		1.60		0.87		1.30		1.76		1.75		0.89	
Sig.	0.16		0.20		0.46		0.28		0.17		0.17		0.45	

Results in Table 4 indicate that sophomores in experimental Group had the highest mean (86.2), followed by

seniors (86.1), then juniors (84.8), and finally freshmen, who had the lowest mean values (83.9) on the overall scale. To determine whether these values were statistically significant, the f-values were calculated as shown in Table 4.

The f-values do not point toward any statistically significant differences in relation to the academic year variable.

To determine whether students differed in their level of non-cognitive skills in relation to what major they were enrolled in, the researchers have calculated their means and standard deviations by university major, as well as the f-value, as shown in Table 5.

Table 5. Mean and standard deviation values of study experimental group's scores on the university major variable

	Locus of Control		Planning		Empathy		Self Confidence		Growth Mindset		Grit		Total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
English N=13	79.5	12.9	81.1	7.7	90.4	6.0	77.2	8.8	96.8	6.4	89.1	8.4	85.3	4.2
journals N=19	81.4	9.5	77.2	9.9	89.0	6.6	79.2	10.7	87.3	15.3	87.7	9.1	83.5	4.5
Education N=10	87.5	6.5	74.6	8.4	87.9	6.4	81.3	7.2	93.3	14.1	88.9	8.2	84.7	6.0
Arabic N=3	87.5	0.0	87.5	7.2	91.7	4.2	77.8	2.4	100.0	0.0	89.7	5.9	88.3	1.1
Others N=12	87.5	5.6	80.5	14.3	90.3	5.1	78.8	8.6	95.8	8.3	91.0	7.6	86.1	6.2
total	83.6	9.5	78.9	10.4	89.5	5.9	78.9	8.8	92.9	12.2	89.0	8.2	84.9	5.0
F-value	2.086		1.326		.417		.293		1.888		.305		.882	
Sig.	.096		.273		.796		.881		.126		.873		.481	

Table 5 indicates that the mean scores of students on the Non-Cognitive Skills Scale were 88.3 for those in Arabic Language, 86.1 for students enrolled in other majors, 85.3 for those majoring in English Literature, 84.7 for those in Educational Sciences, , and 83.5 for those in Journalism.

To determine whether there were any statistically significant differences, the F-value was calculated (shown in Table 5 above), the f-values do not point toward any statistically significant differences in relation to the university major.

To answer the third question "Is there a correlation between the extent to which students in the experimental group possess non-cognitive skills and their GPA"? The researchers have calculated the correlation coefficient between students' scores on the Non-Cognitive Skills Scale in relation to their GPA ratings at university, indicating a weak positive correlation coefficient of 0.064, which is statistically insignificant.

4. Discussion

The study aimed to explore the impact of interactive training programs on developing a set of non-cognitive skills in undergraduates, as opposed to using traditional methods. The interactive training program focused on the following non-cognitive skills: locus of control, planning, empathy, self-confidence, growth mindset, and grit, tenacity, and perseverance.

The study has found that the interactive training program did impact the development of a set of non-cognitive skills or competencies as compared to the traditional training program (Group B) and the Control Group (Group C). The findings revealed that interactive training programs had helped foster three of these non-cognitive skills: empathy, growth mindset, and grit; differences in students' scores in all three groups were statistically significant and in favor of the experimental group (Group A). The effectiveness of the interactive training program could be attributed to a number of factors, including:

- 1) That the interactive training program consisted of a group of activities relevant to real-world contexts, which was contemporary. This could have contributed toward attracting students' attention and boosted their motivation for completing various training tasks.
- 2) Implementing interactive, cooperative, and individualized activities which are centered on discussion,

debate, and brainstorming. All these could effectively and positively influence student motivation, add fun to the learning process, and increase the chances of interaction between students themselves, making them the centre of the learning process, and allowing them to practice critical, creative, and analytical thinking, thus contributing to their overall development and to modifying their cognitive structures.

- 3) The effective implementation of modern technology through the use of short illustrative movies for getting ideas through to the students, which could have raised their levels of interest and interaction among each other and with their trainers.
- 4) The incorporation of issues and topics which interest and concern youths in the Arab World with the interactive training program, including the issues of violence, environmental problems, unemployment, and globalization. This could have allowed students more opportunities for effective interaction, discussion, idea exchange, listening, and having an open mind to the diverse opinions of others.
- 5) Utilizing contemporary assessment strategies, as students were assessed based on their portfolios and projects they had completed during the training sessions, as opposed to using written examination. This could have had a positive impact on student learning.
- 6) That the interactive training program had focused on a set of non-cognitive skills, which were new (and thus interesting) to trainee students, and provide them with an opportunity to succeed on academic, as well as personal, levels.

However, the results did not indicate any statistically significant differences in students on the academic year variable. This result is inconsistent with a number of previous studies. For instance (Duckworth et al., 2007) indicated that older students had more grit as compared to freshmen, mainly due to the fact that older students usually possessed more experience, and thus were more capable of practicing constant grit and hard work in aiming to fulfill desired goals as compared to their younger counterparts, which is positively reflected on their academic scores.

Furthermore, the findings did not indicate any statistically significant differences in the extent to which student acquire these non-cognitive skills on the sex variable, which contradicts the findings of Al-obeidi (2011), where female students had higher empathy than their male peers. The finding of the current study could be attributed to the fact that males and females do not differ in their campus experience at university, as well as they having quite similar social and economic backgrounds, regardless of sex.

The study has also found a weak positive correlation between students' scores on all six non-cognitive skills and their GPA scores. This is consistent with the works of Bazelais et al. (2016), where he asserts that grit is not a significant indicator of academic scores or whether or not students pass a physics course at university, for instance; on the contrary, his study indicated that students' previous academic performance held more importance. However, this result is not compatible with a number of other research papers on the relation between a number of non-cognitive skills such as grit, growth minded, and self-confidence and between students' academic scores and their ability to complete their studies up until graduation. A good deal of papers, including Dweck (2015); Duckworth et al. (2007); Chang (2014); and Gharghout (2016) asserted that a correlation exists between these non-cognitive skills and the academic scores of students, denoting that the academic score of a student is the most suitable indicator of his or her grit toward graduation, and that students with higher levels of grit attain higher cumulative GPAs as compared to their peers with lower cumulative levels. Therefore, it is imperative to cultivate these non-cognitive skills in students (such as grit) in order to increase academic performance in students, and to cultivate skills of locus of control, self-confidence, and planning in preparing students for their future career paths. This is consistent with the findings of Judge, & Bono (2001), who have indicated that a set of non-cognitive skills, including self-confidence and locus of control, can affect job satisfaction and security.

In addition, the results did not indicate any statistically significant to university major in developing these skills in students. This could be due to the fact that a large portion of the study sample are enrolled in the Faculty of Arts and have quite similar academic experiences, as previous studies have shown that students who are enrolled in more academically challenging courses usually exhibit more grit and growth minded than their peers (Dweck, 2015).

It is evident that the training program did not contribute to developing planning, locus of control, and self-confidence skills in students, in spite of it being highly imperative in achieving success and developing problem-solving skills which students will practice in the future. This could be due to the fact that students have prior knowledge of these skills, and that the strategies used for developing these skills were insufficient. This

indicates that the suggested activities for this training program need to be reviewed; additional activities or changes could be recommended for helping students better develop these skills.

5. Recommendations

The following is a list of recommendations that one believes, if implemented, would contribute positively to develop and reinforce a set of non-cognitive skills in students:

- Researchers should show more interest in investigating whether students possess these non-cognitive skills, and identify students who are undergoing academic problems in hopes of providing them with assistance and help in completing their undergraduate studies.
- Conduct more research on the attitudes and perceptions of the academic teaching staff at universities toward the importance of these non-cognitive skills, and how much interest they show toward helping their students acquire them.
- Hold training sessions for teaching staff at university to emphasize the importance of non-cognitive skills in students.
- Design training programs for students to nurture their various non-cognitive skills which help improve their academic performance, especially in students with low GPA scores.
- Conduct more studies on the most efficient strategies that could be implemented for developing non-cognitive skills in undergraduates.
- Encourage teaching staff at university to develop non-cognitive skills in their students through the use of appropriate strategies, as these skills contributes to improving their academic achievement.

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