



Training for Leadership and Team Skills from Freshman Year Forward

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Leadership and small-group skills for engineers are not only important for interacting with the 3-5 people on a design team during their academic career, but for performing well on professional engineering teams, which often include customers, support personnel (who are not engineers), and other constituencies in the workplace. This issue is best captured with this quote from Mr. Bock of Google, *“What we care about is, when faced with a problem and you're a member of a team, do you, at the appropriate time, step in and lead. And just as critically, do you step back”*¹

Our work with freshman engineering students is based on the Meyers-Briggs Type Indicator® (MBTI) and Klein Group Instrument™ (KGI) assessments, training students to understand their own personality characteristics, and to refine them to become more effective leaders and team members. Our training aims to have students enhance their ability to offer new ideas or solutions to advance the work of their team and to productively address conflict while actively engaging team members and contributing to a constructive team climate. With the combination of MBTI and KGI, students will be trained to consciously recognize differences in personality styles, without labeling a characteristic as a strength or weakness. The results of these two instruments give students an individual ‘portrait’ of themselves, which is then used as a starting point for discussion, training, interaction with others, and conscious, insightful reflection. With the KGI, each student receives a personal profile comprised of numerous action items to develop group skills at his or her own pace. Our work in this freshman course provides the basic training on the utilization of information provided by these instruments, asks each student to pick two skills from their personal KGI profile, and has developed assignments to promote reflection on their implementation of KGI skills and personal behaviors.

INTRODUCTION/ MOTIVATION

“Today, the Myers-Briggs Type Indicator (MBTI) is the most widely used psychology instrument in the world for the normal population, utilized in counseling, educational settings, and business and professional life.”² In engineering education, MBTI has been applied as a learning style model to improve teaching and learning in the classroom, interactions between professors and students, and leadership and teaming skills in both the academic and professional settings. Felder and Brent applied MBTI as one of the four learning style models to promote ‘teaching around the cycle’ to better meet the learning needs of the diverse group of students/learners in a class. They suggest professors can benefit by apply a learning style model, like MBTI, to ‘designing a course or curriculum, developing instructional software, forming cooperative learning teams, or helping students develop interpersonal, leadership, and communication skills.’^{3,4} Yokomoto and Ware have used it as a learning styles instrument and as

a research instrument in classroom assessment. It helps us to understand the teaching/learning process, and it helps us counsel students according to their personality type, their expectations, and their beliefs.”⁵ As suggested by Scott, Parsons, and Seat, “Learning style information is important to convey to students because it helps them understand their interactions with other students and is particularly useful in understanding and assisting with their interaction with professors.”⁶ On the course level, Kim and Moon have coupled the MBTI instrument with TTCT (Torrance Tests of Creative Thinking) test to enhance student’s experience with creativity in a design course.⁷ In the current academic and workplace environment, teamwork and leadership abilities are essential skills for engineers. Varvel, Adams, and Pirdie have used “the MBTI and its associated psychological type training to study and increase the effectiveness of teams”.⁸ They have reported that “the psychological type profiles of the team alone cannot predict the level of a team’s performance or effectiveness. The greatest gift that the MBTI gives individuals is the increased understanding of both themselves and others.”⁸ Doré has incorporated the MBTI instrument in a course by introducing the concept of personality followed by a section on how it can be used in the context of teamwork. This group has also implemented a section that concentrates on the team building activities per se, with the emphasis being placed on means of avoiding conflicts before they arise within the team.⁹ On a grander scale, Keraga, McCloskey, Smith, and Schierenbeck have implemented this educational component in Professional Development and Leadership into the Design experiences required for all undergraduates, taught by the professional staff in their Center for Student Leadership Development in the form of two 1-credit experiences (Professional Development I and Professional Development III, respectively).¹⁰

Whether there exists a ‘real’ or ‘perceived’ conflict within team, the challenge for many instructors is to develop an effective way to teach teaming and have the students implement ‘proper team behavior’ in an academic setting. We are proposing that being aware of your personality type is not enough to truly change personal and team behaviors. We are suggesting that actions or skills that can be learned and practiced in many different situations, and are necessary to take the students’ personal development to a new level in the academic environment and, afterwards, into their professional careers. Hence, the Klein Group Instrument for Effective Leadership and Participation in Teams (KGI) provides a connection, or a ‘bridge’ from MBTI to specific small group behaviors and team work. The KGI is a tool that allows students to gain insight into their personal behaviors, particularly in small groups, and develop their **individual skills** in leadership and teaming. Developed in conjunction with the Center for Applications of Psychological Type (CAPT), the organization founded by MBTI author Isabel Myers, the intent of the KGI measurement is to complement the MBTI tool and to extend applications of typology deeper into leadership development and group life in very practical, concrete ways.

BACKGROUND / THEORY

To set the stage for this work, the fundamental ideas supporting the KGI are presented here. These ideas have formed the basis for the activities in our freshman engineering seminar course, including administration of the instruments, the workshops, and reflection pieces. Following this section, our program will be presented, and then examples of student feedback with surveys of, and reflection on, their experiences.

This discussion of **Klein Group Instrument (KGI)** summarizes the work of the author, Dr. Robert Klein, who has been a collaborator with the instructor of the freshman seminar course at Western New England University. Dr. Klein has been involved in training our engineering students in social skills for fifteen years. The Klein Group Instrument (KGI) has demonstrated substantial reliability and validity. For the sixty-three item assessment, the internal consistency reliability coefficient alphas run from .82 to .86 for the four main scales, in a very good range, and from .70 to .80 for the nine subscales. For test-retest reliability, the Pearson correlations run from .78 to .92 for the scales and the subscales.²

With regard to validity, a concurrent validity study with 1,050 participants, who took both the KGI measurement and the Myers-Briggs Type Indicator assessment, produced very significant correlations between the two instruments' scales, which followed the theoretical designs of the measurements. In a smaller concurrent validity study with the KGI measurement and the Fundamental Interpersonal Relations Orientation-B (FIRO-B) assessment, again there were significant correlations between the two sets of scales, as would be expected based on their theoretical constructs. In studies with hundreds of undergraduate and graduate students, trained in leadership courses with the KGI assessment, all of the students were able to develop new skills in out-of-class group settings over a three-month period.²

The conceptual design of the KGI assessment can be simply illustrated in the 'KGI Diamond', which shows the interrelationship of the key factors for positive team experiences and outcomes. When it is combined with the MBTI assessment, one can look at the personality preferences that are associated with specific group behaviors, as will be seen shortly.



Figure 1. The KGI Diamond for Group Behavior²

The KGI instrument and resulting personal profile were designed to focus on the essential aspects of small-group life, and provide the foundation for building team leadership and group skills. The system provides a scientific based-method for modifying behavior on teams to achieve better individual performance and overall team outcomes. As stated by the KGI developer, *“The ideas in this model help to promote better interpersonal communication, more effective collaboration, higher creativity, and greater productivity, wherever people work together in joint enterprises. Therefore, one of the goals with this design is to infuse fresh ideas that will enhance cooperative activities in our professional organizations.”*²

In Figure 2, the correlation between the preferences of the MBTI and the KGI assessments are shown. The developer states that, *“The intent of the KGI tool is to have an assessment that could do two things: one, stand alone as an independent measurement of group behavior; and two, complement the MBTI assessment in order to connect typology more powerfully to group life.”*²

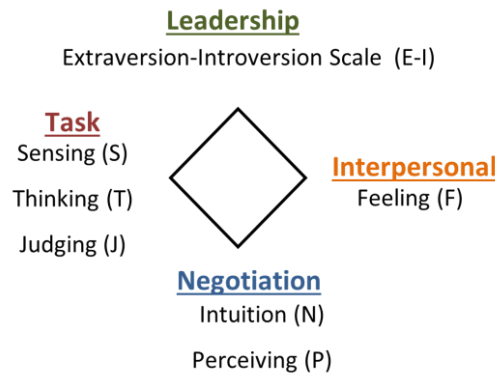


Figure 2. The KGI Diamond matching the MBTI and KGI points²

For our work, an important connection between the two instruments is in the leadership domain, where Extraversion and Introversion correlate. The model can address important questions: how do introverts become leaders? And how do extroverts become more effective overall team players? It is common knowledge that many great leaders fall on either end of the MBTI E-I scale; however, what sets them apart is their excellent skills to maneuver themselves along the range of the E-I scale as a situation dictates. They know how to listen closely (an Introversion skill) and when to speak up (Extraversion). In the area of leadership, KGI bridges that gap and ‘teaches’ people to move out of their stereotypical introverted or extraverted self, and methodically with KGI action items, take steps modify their behavior appropriately. They can then balance E-I skills to become more effective team members. When everyone in the group is involved with the KGI program, it promotes a greater appreciation of those with a personally type that is different from yours. With this E-I example, all who must learn to be tolerant and patient with each other, making a conscious effort to ask for others’ opinions and step up to offer that opinion at the appropriate time. This is a valuable starting point for improving students’

group interactions. As participants mature, they can add more KGI skills to their personal repertoire, further enhancing their abilities as leaders and group members. This very much aligns with the type of ‘leader’ businesses, like Google, are looking for in today’s business climate. Thus the KGI tool and resulting personal profile fills the void often found when MBTI is used exclusively. The KGI presents **skills**, that with some training and an open mind, enable students to resolve conflict in positive ways, rather than resorting to solving team issues just saying, ‘be nice and stop fighting’ or ‘so-and-so is so annoying, I will do it myself’ or ‘if I was on a team with my friends...’. With engineering teams, especially on the freshman level, the skills have to be basic, understandable and achievable in the life of a first year college student. Each student receives a unique, customized KGI Personal Profile, which contains suggestions on numerous skills that student can work on across the various KGI domains. The KGI skills can be selected and practiced one or two at a time. The KGI Diamond in Figure 3 includes a brief description of the focus in each area of the diamond, i.e., Leadership, Task, Interpersonal, and Negotiation. It is up to the individual to target the areas they feel will benefit them the most. As put forward by the KGI developer, “...in addition to the task issue, there is also the matter of establishing positive member relations so people can cooperate successfully on the project. So a quality leader will need to pay attention to both the task and interpersonal elements. The leader will also use sound negotiation tactics to strike the right balance between the task and interpersonal concerns.”² With freshman engineers, their goals are usually to ‘minimize conflict on a team’, ‘get everyone to contribute equally’, and ‘get the task done on time’ with positive result. What they are looking for is ways to get better outcomes **and** a positive team experience! We have found that the KGI model is able to guide them in exactly those directions.



Figure 3. The KGI Diamond highlighting the primary skill set associated with each point²

Displayed in Table 1, there are specific subscales for each of the four major KGI scales that identify the particular skills someone needs to build. Novices, like our freshman, may work on one or two points from these subscales, and a mature manager in a corporate environment may seek to master 8-10 of the points. Everyone else is somewhere in between, but ripe for improvement with focused action items provided in their individual KGI Personal Profile.

Table 1. Summary of Points of the KGI Diamond and the nine subscales²

LEADERSHIP	Assertiveness	the ability to express opinions and invite feedback about them
	Group Facilitation	the capacity to organize different aspects of the group's life
	Initiative	the readiness to be the point person
NEGOTIATION ORIENTATION	Perspective Taking	the ability to understand others' concerns, values, and interests
	Constructive Negotiation Approach	the competence to construct win-win agreements that promote team unity
TASK FOCUS	Task Analysis	the ability to examine the task and create a sound strategy
	Task Implementation	the capacity to execute the strategy successfully, while making appropriate adjustments along the way
INTERPERSONAL FOCUS	Positive Group Affiliation	the skill of helping a group develop camaraderie and a team spirit
	Feeling Orientation	the readiness to attend to and manage the emotional issues within the group

Our intent is to tailor the KGI system to the level and needs of the first year engineering students and beyond, to make them effective team leaders and group members. It is our opinion that our version of the KGI program relatively easily to adopt in many areas of the curriculum by using our course materials, or 'tweaking' them to fit the needs of the instructors and/or situation. The KGI materials can be presented to students in a variety of modalities such as virtual classrooms, workshops or traditional in-class instruction.

OUR PROGRAM IN FIRST YEAR ENGINEERING SEMINIAR COURSE

Our course is designed to introduce first-year engineering students both to the engineering profession and the practice of engineering as it relates to their university experience. The First Year Engineering Seminiar is a 1-credit course that meets once a week for 1 ½-3 hours. In line with the university-wide general education requirements for first year students, this course enables students to further develop academic and life management skills and learn how to use university resources. The Target Competencies in First Year Seminar (as part of the university-wide general education requirements) states that students will be able to demonstrate ability to assess personal strengths and interests in a manner relevant to career alternatives and/or choices.

To provide assessment evidence for this competency, students complete guided reflections papers on their personal experiences applying their KGI skill(s) to engineering teams and/or group situations occurring in their daily lives on campus. With a usual enrollment of 120-180 students, the Freshman Seminar Assistants (FSAs) instruct groups of 20-24 students in ‘breakout’ rooms, and then all come together in the main lecture hall for the seminar or workshop of the week. This course also employs an active virtual classroom for news, assignments, homework collection, grading, and general communications. Our level of participation in this teaming and leadership training is over 90% of all the students, who take the two instruments, attend the workshops, and complete all the required reflection papers. The surveys are posted in the virtual classroom and completion by students is strictly voluntary. Complementary to this training, students are encouraged to implement these new group behavior skills in their project-based Introduction to Engineering course and through their participation in a variety of activities in our university community, e.g. sports teams, clubs, student government and student professional societies.

The following discussion will describe in more detail each activity and comment on the connections to the fundamental ideas supporting the KGI instrument and methodology. As outlined in Table 2, our leadership and team training is comprised of activities through the entire semester, allowing the student time to practice and reflect on their KGI skills.

Table 2. Introduction to KGI for leadership and teaming: First Year Seminar Activities

Week in Course	Activity	Instructions to students	Assessment or personal student reflection
Week #1	MBTI personality profile completed.	Complete instrument.	
Week #3	Workshop: Interpreting Test Instrument (MBTI) results and introduction to Klein Group Instrument (KGI)	Review results. Attend class for workshop. Take KGI instrument on-line within the week.	Reflection paper on MBTI Survey on MBTI
Week #5	Workshop: Training on how to implement KGI results. Use personal KGI skills for teamwork, leadership, and small group behavior.	Attend class for workshop. Select and practice one or two KGI skills on your design team and extracurricular activities.	Reflection paper on your personal experience implementing your one or two <i>personal</i> KGI skills. Survey KGI #1 -present
Week #12	Activity & Mini-workshop: Practice in team behavior in the Marshmallow Challenge, followed by mini-workshop on KGI skills for teaming.	Participate in hands-on activity. Attend ‘refresher’ lecture. Invitation to practice two more personal KGI skills.	Reflection paper on in-class activity and continued implementation of personal KGI skills. Survey KGI #2 - future

The specifics of the program and connection to KGI concepts

First, freshmen engineering students complete the MBTI assessment in week 1, and get their personal profile results. In week 3, a workshop conducted in class to explain the motivation of the program and show students how to interpret the ‘four letters’ and corresponding scales in their MBTI profiles. For assessment, a reflection paper is assigned and graded, and an optional survey is administered.

Second, the students take the **KGI assessment**, which is delivered online and has a **completion time approximately 20 minutes**. The KGI assessment provides each student with a personal profile comprised of growth statements and focused action items or skills. A workshop is presented to help students interpret their personal KGI results and instruct them how to use the information in their profile to improve their group behavior. The discussion is sprinkled with testimonials from individuals who have experienced the positive impact of the KGI program in their professional and personal lives. Figure 4 is an example of a typical KGI Profile, noting personal strengths in the four points of the KGI Diamond.

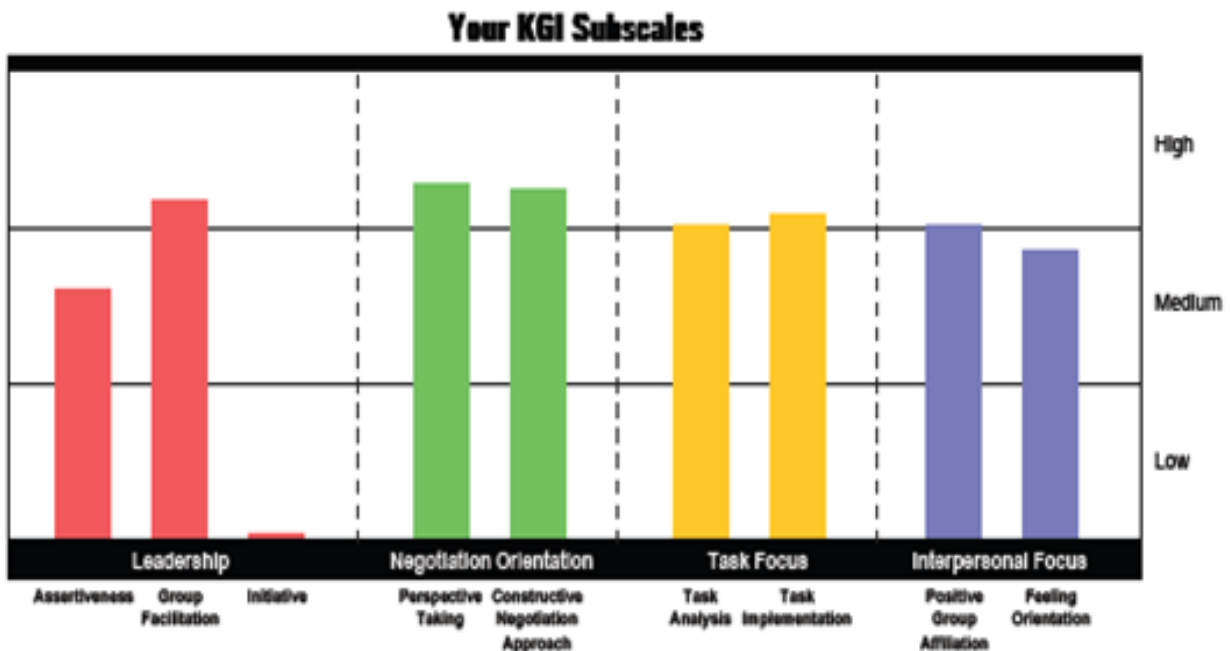


Figure 4. Sample of a KGI Personal Profile with subscales

Students are initially instructed to select one or two of their own personal KGI skills for implementation in an environment of their choice. During any small-group interaction, students may be implementing the different skills. For illustration, the ‘Leadership’ is shown in Figure 5 below. The most left-hand bar is the overall Leadership score for the individual (the composite of

all of the subscale scores), with the adjacent bars indicating the strength on the subscales of assertiveness, group facilitation, and initiative.

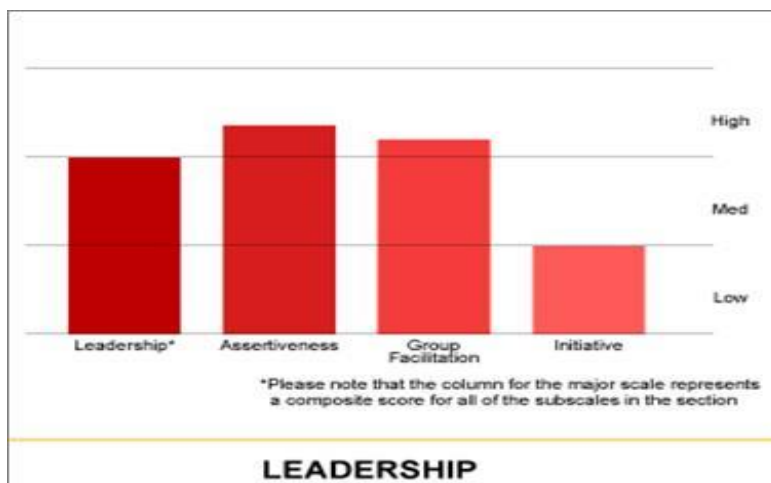


Figure 5. Sample of the KGI Personal Profile on Leadership and its subscales

Accompanying the graphical display, the KGI Personal Profile provides growth statements for each subscale, action items for skill development, which the individual can implement in any group or team situation. The uniqueness of the KGI assessment lies in these statements, which are scientifically matched to the individual based to the responses to their KGI assessment. In this case, a growth statement given for this sample profile is as follows: "The initial effort to implement a task requires a lot of work. Celebrate any early success to help build positive momentum."² The individual/student can recognize this worthwhile technique and begin to leverage it in group interactions. An herein lies the power of the KGI skills--when everyone is working in a similar manner with their own personal skills, not only are individuals gaining new skills, the team as a whole benefits and moves to a higher level of productivity. As the developer of the KGI comments, "The personal data in the KGI Profile are specific to the individual, based on how the individual responded to assessment questions. For each subscale area, information is presented in the following areas: 1) Things you enjoy doing in that sphere; 2) Things you may find difficult or challenging; 3) Growth statements about how you may improve your performance."²

For assessment, the reflection papers grounded in these points: "What comes naturally and easily to you in group settings?" "What is difficult?" "What specific new skills will lead to personal growth?" The key here are the **growth statements**, which offer clear suggestions on behaviors that will boost the student's performance. A reflection paper, which requires students to cite their two KGI skills and discuss their experiences, is assigned and graded, and an optional survey is posted in their virtual classroom.

Third, students participated in ‘The Marshmallow Challenge’¹⁰ and mini-workshop. The Marshmallow Challenge is well-known group activity in which teams are given a kit containing twenty sticks of spaghetti, one yard of masking tape, one yard of string and one marshmallow, and in 18 minutes, are required to build the tallest free standing structure with the marshmallow on top. This was conducted to bring more attention to the KGI skills at the end of the course, and formally ‘refresh’ the students on the value of the KGI skills. The focus of the mini-workshop is to encourage each student to refer to their personal KGI profile often, and to continue to work on the action items at his or her own pace, adding one or two at a time, now and in the future.

FEEDBACK AND ASSESSMENT

To assess the impact of our program using the KGI instrument and subsequent training in the first year seminar course, both quantitative and qualitative feedback was collected from our students. In an effort to get quantitative feedback, three short surveys, one on their MBTI results and two on their personal KGI profiles, were posed to the students in the virtual classroom. The student response to the surveys unfortunately dwindled as the semester went on, especially as the demands in their academic life increased at the end of the semester. Reflection papers provided written feedback from students, and examples from the ‘Leadership’ point of the KGI Diamond are shared here.

Quantitative feedback from student surveys

Three surveys were designed to get a ‘birds-eye view’ of our leadership and teaming activities from the perspective of the students enrolled in our freshman seminar class. The key points selected for assessment were: “Is the class accepting of the MBTI and KGI instruments and their personal results?”, “Are they using their personal KGI profiles? “, “Overall, are the students, armed with personal KGI profiles and training in our workshops, perceiving themselves as better team members on engineering teams?”, and “Do the students feel they can move forward with their KGI skills to have positive team experiences?”.

As students review their MBTI results, 79% of the students responding to this survey find, from their point of view, the ‘four letters’ and scales do describe them accurately. Nearly the same percentages, 83% of these students, believe their MBTI profile will help them with engineering teams and working in teams in their professional careers, respectively. The KGI Personal Profile, which has its theoretical connections to the MBTI, is intended to provide ‘skills or action items’ specially tailored to the individual student. Our survey results show that 68% of students agree their KGI profile describes their current group behavior well, with 5% as outliers feeling their KGI is inaccurate. This is also supported by observations made by the instructors and FSAs, noting that deliberately dealing with personal feelings and relationships is not at the top of the list for ‘engineers’, but students are inherently interested in getting ahead professionally. The

responses from 85% of the students feel the KGI skills and training will help them on engineering teams, and 79% feel it would help them in their professional career.

Although the number of students participating in the third survey (at the end of the semester) is significantly smaller, 90% of the respondents feel their group behavior on engineering teams will benefit from this KGI training in the future. Eighty percent of students feel it will carry into their professional career. It is suggested by the data in Table 3, which has very few outliers on the negative side of neutral in all cases, the students have taken the KGI training seriously for better group behavior now and in the future.

Table 3. Tabulation of student responses to selected items on the three surveys

Survey Question Survey #1- after MBTI (119 replies) Survey #2- After KGI training (82 replies) Survey #3- Implement KGI, end of course	Highly accurate/ agree	Somewhat accurate/ agree	Neutral	Somewhat inaccurate/ disagree	Inaccurate/ disagree
#1 -How accurately do you feel you MBTI results describe you?	12.6% (15)	66.4% (79)	12.6% (15)	6.7% (8)	1.7% (2)
#2- How well do you feel your KGI profile described your current group behavior?	13.4% (11)	54.9%(45)	26.8% (22)	3.7% (3)	1.2% (1)
#3- My KGI training will help me in the future with my group behavior.(30 replies)	13.3% (4)	63.3% (19)	13.3% (4)	3.3% (10)	6.7% (2)
IMPACT on TEAM BEHAVIOR					
#1- Do you think your MBTI results will help you in the following situations?					
On engineering teams.	39.5% (47)	43.7% (52)	10.9% (13)	3.4% (4)	2.5% (3)
In professional career	28.6% (34)	54.6% (65)	12.6% (15)	1.7% (2)	2.5% (3)
#2- Do you think your KGI profile will help you in the following situations?					
On engineering teams.	39.0% (32)	46.3% (38)	9.8% (8)	2.4%(2)	2.4%(2)
In professional career	30.9% (25)	48.1% (39)	14.8% (12)	3.7% (3)	2.5% (81)
#3-In the future, how strongly do you feel your KGI profile will help you in the following situations? (32 replies)					
On engineering teams.	21.9% (7)	68.8% (22)	3.1% (1)	0.0% (0)	6.3% (2)
In professional career	32.3% (10)	48.4% (15)	12.9% (4)	0.0% (0)	6.5% (2)

Our results from survey #2, which posed the question “To date, where have you used your KGI skills?”, 90% of the students responded with ‘on engineering teams’, and 70% of these same students also selected ‘in school’. This suggests students are implementing the growth statements in their current activities.

From Table 4, our responses (from surveys #1 & 2) show 34% of the students like to be ‘the team leader’, and 50% of our group most like to be ‘an active participant’ in team projects. With KGI training, percentage of students more likely to be the team leader and/or an active

participant in team projects increased by 13%. A slight move from ‘a reserved participant’ to ‘an active participant’ can also be seen after the students received their personal KGI profiles and training. Survey # 3, which is done post-KGI training, shows being ‘an active participant’ as the role of choice by the students. Also in survey #3, it was posed, “Obtaining these KGI skills will increase my confidence about working in teams”, and 80% of the responses agreed. This suggests students may perceive themselves as better team members after KGI training.

Table 4. Summary of team roles taken by students pre-, during, and post-KGI training

Survey	Be the team leader.	Be an active participant.	Be a reserved participant.	Wish I didn't have to work on teams, preferring to work on my own.
#1- after MBTI #2- After KGI training #3- Implement KGI, end of course				
#1 In team projects, you most like to (119 replies)	34.5% (41)	48.7% (58)	10.9% (13)	5.9% (7)
#2 In team projects, you most like to ... (83 replies)	33.7% (28)	54.2% (45)	6.0% (5)	6.0% (5)
#3 With your personal KGI skills and the training presented in this course, my role in team projects is most likely to.... (32 replies)	46.9% (15)	62.5% (20)	6.3% (2)	6.3% (2)
#3 The role I play on teams has changed since I have received my personal KGI profile. I am more likely to ... (32 replies)	40.6% (13)	53.1% (17)	3.1% (1)	3.1% (1)

Of the respondents to survey #3, 71% indicate their KGI has been helpful in understanding team behavior and 75% believe that if they continue to practice it will be of benefit to them. This is shown in Table 5. We are encouraged that many students feel KGI assessment is a useful tool to help them engage in positive team experiences and work toward being better team leaders in the future.

Table 5. Summary of student response to their future use of their KGI skills

Survey Question	Highly agree	Somewhat agree	Neutral	Somewhat disagree	Disagree
Survey #3- Implement KGI, end of course					
The KGI gives me a deeper understanding of team behavior and I would like to continue my training to better understand and implement the information in my personal KGI profile.	22.6% (7)	48.4% (15)	22.6% (7)	0.0% (0)	6.5% (2)
If I continue to practice the skills suggested by the KGI, it will help me become an even better leader and team member in the future.	31.3% (10)	43.8% (14)	15.6% (5)	3.1% (1)	6.3% (2)

In summary, our results suggest KGI program, which include the instrument, accompanying training workshops, and reflection papers, provides advantages to students greater or equal to that of MBTI alone. The KGI personal profile, which is comprised of skills or action items, gives students a ‘road map’ or ‘set of instructions’ to modify their own behavior, and just as important,

they begin to understand and appreciate the behavior of others. Table 6 illustrates our initial results, with feedback trending to the positive with 64% of the respondents in agreement.

Table 6. Response to extension of team training from MBTI to KGI

Survey Question	Highly agree	Somewhat agree	Neutral	Somewhat disagree	Disagree
Survey #2- After KGI training					
The KGI gives me a deeper understanding of team behavior than that of the MBTI.	16.9% (14)	47.0% (39)	33.7% (28)	1.2% (1)	1.2% (1)

Qualitative feedback from students on implementation of their selected KGI skills

With qualitative feedback from the guided reflection papers, we share some student comments focused on their experiences with ‘Leadership’ point of the KGI Diamond and its corresponding subscales.

LEADERSHIP : Subcategory of Assertiveness



...**Freshman Council**”I think being aware that I am lacking in leadership skills will encourage me to speak up and get involved more.”

... **ENGR xxx**...”Speaking my mind and telling my group members my ideas was difficult because I did not want the group members to think my ideas were stupid or reject them. I am unable to make the desired improvements because I am still afraid of rejection. In order to resolve this problem, I have to overcome my fear of rejection and propose my ideas. If I think through my ideas carefully and accurately, they could be good ideas that will be very beneficial and useful in our group design project.”

LEADERSHIP : Subcategory of Group Facilitation

...**ENGR xxx**...”When our group was in a disagreement I was always the first person to try and resolve the situation. I tried to ease the tension between group members and help solve the problem and come to an understanding. The two group members did not listen and calm down at first, but after saying numerous times that we need to move on, they did. The other group member praised me for easing the tension and keeping things on track.”

LEADERSHIP : Subcategory of Initiative

... **Physics lab**...”Usually I would do all of the data recording and analysis while I let my partners do most of the work. Over time it seemed like our group was creating more and more mistakes and I knew that I should lead the group in order to get better grades. Instead of just recording all of the data I began to actively participate and do a lot of the hands on work I had put to the side before.”

As a final thought, the quote below is from a Freshman Seminar Assistant (FSAs) who had taken the course the previous year and subsequently implemented their KGI training.

In general from our FSA : “involved taking certain personality tests (MBTI and KGI), and with the results from the two tests I reflected on what skills I had down, and skills in specific areas that I was lacking. ...I tend to be an introvert and not take the lead, and my inability to take others perspective in a group situation, I went back through my reflections on how I can improve upon those skills even further as I entered my position as an FSA.I was able to apply these skills almost immediately with my section of students. ...the MBTI and KGI tests (and KGI skills) allowed me to see what I needed to do to improve as a leader to the group of students that I was assisting in that same class a year later, and this enabled not only me to be more successful, but the students to be successful.”

DISCUSSION AND OBSERVATIONS

Our student comments and survey results suggest we are moving in the right direction and the KGI program does enhance the behavior of students on engineering teams. Equally important, the students see an immediate benefit and the potential of using the KGI skills in their future professional endeavors. The comments from the students show that the KGI skills can be learned and practiced in many different situations, including co- and extra-curricular activities. The KGI Personal Profile, which allows students to gain insight into their personal behaviors, particularly in small groups, facilitates the development their **individual skills** in leadership and teaming. Hence, the KGI program provides the ‘bridge’ from MBTI to more specific small group behaviors and team work. The results suggest that many students, who have bought into the KGI program (and completed survey #3) view themselves as being “an active participant in the group”, even more so than viewing themselves as the ‘leader’. In truth, being an effective team member can be just as critical as being the leader. As a note, this is in line with the statement by Mr. Bock, “...*you're a member of a team, do you, at the appropriate time, step in and lead. And just as critically, do you step back...*”¹

Also, based on instructor and FSA observations of team interaction and review of the students’ personal reflections, the results have been extremely positive. The **simplicity of the model** and **the students’ intrinsic motivation** to modify their own behavior to become more effective team players are hallmarks of this approach. We are able to train students and expose them to ideas in perspective taking, constructive negotiation, group facilitation, leadership initiative, and ways to build cohesive, creative teams that are highly productive. Additionally, we are compiling testimonials from students, who have taken this training ‘beyond’ into the workplace, and found it life changing.

Our experience parallels other work in the KGI methodology, as reflected in this statement by the KGI developer: “*As a person makes positive adjustments, which improve performance, other*

people observe the results, and usually respond with supportive feedback. These new skills have helped others by improving the task performance, or the social climate, on their team, and they appreciate it. There is a new level of social approval, and this social approval does wonders. It increases an individual's self-confidence, and comfort level in groups. It raises belief in one's personal competence: how one can make constructive adjustments, progress, and reach new levels of social success. Based on socially rewarding experiences, people feel better about themselves, about others, and about their ability to collaborate productively in groups. There arises a new mood of positivity about social relations.”²

CONCLUSIONS

Overall, our qualitative feedback, in the form of student reflection comments and testimonials has been very powerful, and our quantitative analysis of the effectiveness and impact of the KGI skills is trending to the positive on the professional development of our engineering students. The following points highlight our work to-date with the KGI program with our first year engineering students.

- With the KGI, each student has a **personal profile** and focused actions items to work on at his or her own pace in his or her own venue or situation.
- Our surveys show the majority of students view the KGI and the training as a **positive experience and useful in working on engineering teams**. Additionally, they feel implementing their KGI skills will help them with teaming and leadership in the future as they enter the engineering profession.
- Our results through observations of team interaction and the students' personal reflections are extremely positive. The **simplicity and accessibility of the model** and **students' intrinsic motivation** to modify their own behavior are the hallmarks of this approach.
- To date, our **testimonials** from students, who have taken this training beyond this course, are positive.
- Our work with engineers mirrors that found by the developer of the KGI instrument with applications to the general population. *“Importantly, with this system, people become acquainted with a process of development that is at the heart of individuation. As people gain several new skills and experience these changes, they taste the beautiful water of personal development. They increase their ability to assess themselves, to use their reflective powers, to make constructive changes, and to grow.”²*

FUTURE

- Enhancements to the quantitative assessment of our program in terms of personality preferences, choices of KGI skills and their degree of implementation, and impact on leadership and teaming in both in the academic and professional arenas.
- Opportunities to observe student teams pre- and post- training in more depth, in smaller groups, and in different situations.
- Development activities spanning the entire curriculum and beyond, in order to **facilitate students' growth in leadership and teaming** utilizing the skills provided by the Klein Group Instrument (KGI) as applied to engineering and the dynamics of the profession.

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