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Kratos Universidad EAFIT: A New Platform to Live Learning Experiences

Sara Aguilar-Barrientos, Alejandro Arias-Salazar,
Juan Esteban Escalante, Jaime Barbosa,
Manuel Esteban Acevedo-Jaramillo,
and Juan Pablo Román-Calderón

Introduction

Kratos is an experiential learning program created at Universidad EAFIT in September 2017. It was developed by students and instructors and seeks to complement and transform student development processes through experiential learning, so undergraduate students can develop certain employability or soft skills desired for a successful professional future. Based on synergies between education, public, and private sectors, its intention is to have an impact upon education, as the institution believes in new learning methodologies that promote knowledge together with an education based on challenges, experiences, and teamwork. These allow preparing professionals capable of dealing with the different problems existing around the world today.

S. Aguilar-Barrientos (✉) • A. Arias-Salazar • J. E. Escalante • J. Barbosa
J. P. Román-Calderón
Universidad EAFIT, Medellín, Antioquia, Colombia
e-mail: saguila2@eafit.edu.co; aarias@eafit.edu.co; jescala2@eafit.edu.co;
jbarbosa@eafit.edu.co; jromanca@eafit.edu.co

M. E. Acevedo-Jaramillo
Ministerio de Educación, ICETEX, Bogotá, Colombia
e-mail: maceved@eafit.edu.co

To achieve this, students are invited to participate in international-level challenges where they work in interdisciplinary teams, develop technological appropriation and creativity, learn to handle high-pressure situations, improve academically, develop resilience and emotional intelligence, and innovate. This program currently includes six projects bringing together teams of 20–45 people, between students, mentors, and instructors. A description of this program forms a valuable contribution to this handbook, as it provides good practices that can be replicated in different educational institutions and in international business programs that wish to work in an interdisciplinary and experiential manner with other programs and projects.

The program's design, structure, and work method are presented as a reference for those who want to implement this kind of program in their institutions, because its results have shown to be successful, both in terms of performance and in terms of soft skills development. Thus, Kratos is conceived as an educational platform created under experiential learning guidelines. Its name was agreed with the program's main sponsor and originated based on the Greek God named Kratos, who was the divine personification of strength and power in Greek mythology. A third word was added: Future, to allude to the fact that the program's participants are undergraduate students who will enter the workforce in the near future, providing employability skills in high demand. So, the name usually comes along with the slogan: Kratos. Strength, Power and Future.

The Experience

The target audience for this program is undergraduate students from all disciplines within Universidad EAFIT. All projects take over three months to be developed and each one involves from 20 to 45 people, including students and instructors. Each project requires specific materials, software, professional support, and other resources according to the nature of the resulting artifact that will compete in international challenges. Students participate at no cost because the institutions and companies involved provide financing for the projects.

The Kratos program intends to provide an opportunity for all students to learn by performing a specific role within a project, and to measure, monitor, and analyze the acquisition and development of employability/soft or work-related skills, including creativity, job tension, emotional intelligence, teamwork, and resilience.

Purpose

Defined as layered technology architectures that present a governance model that includes rules for participation and rewards (Parker & Van Alstyne, 2014; Tiwana, 2013; Yoo, Henfridsson, & Lyytinen, 2010), the literature highlights the roles of platforms as mechanisms that facilitate innovation and knowledge (Laursen & Salter, 2014). Faced with this scenario and considering the effectiveness of active methodologies for learning (Paul & Mukhopadhyay, 2004), the Kratos program has arisen as part of an institutional plan that searches for new knowledge generation, transmission, and adoption schemes and mechanisms. This initiative was conceived under the guidelines of experiential learning and materialized through high impact projects that seek to respond to complex challenges.

The program has been designed as a platform that intends to potentialize learning in students, permit the development of competences that complement technical skills, and consolidate a nascent innovation ecosystem. Based on an analysis of real-life situations and applying approaches like experiential learning, it seeks to promote active learning, interpersonal and collaborative skills, open research, problem-solving, critical thinking, intrinsic motivation, and a desire to learn (Springer, Stanne, & Donovan, 1999). On the other hand, cooperative environments are a way to attract and direct students, generating greater levels of participation and commitment that can facilitate the development of skills like critical thinking, metacognitive learning, synthesis, and integration (Johnson, Johnson & Smith, 1991).

Kratos' operation requires a cross-cutting structure responsible for managing multiple matters related to project planning, execution, and control. Program leadership is the responsibility of the deans of the University's Business School and Engineering School, assisted by a general coordinator. There is also a Committee made up of the persons in charge of the different processes included in the initiative: learning process, communications, financial planning, and operations.

The program's general coordinator is responsible for ensuring proper technical and administrative management as well as optimal team performance. The financial level manages associated internal and external resources so that projects are executed under strict cost, scope, time, and quality guidelines. Sponsorship Management and Communications seek to promote the visibility of the program's sponsor and allies, ensuring proper internal and external communications. The learning process direction is responsible for ensuring the process of team constitution and sustainability and for measuring student learning within the Kratos projects. The program's organizational chart is given in Fig. 14.1.

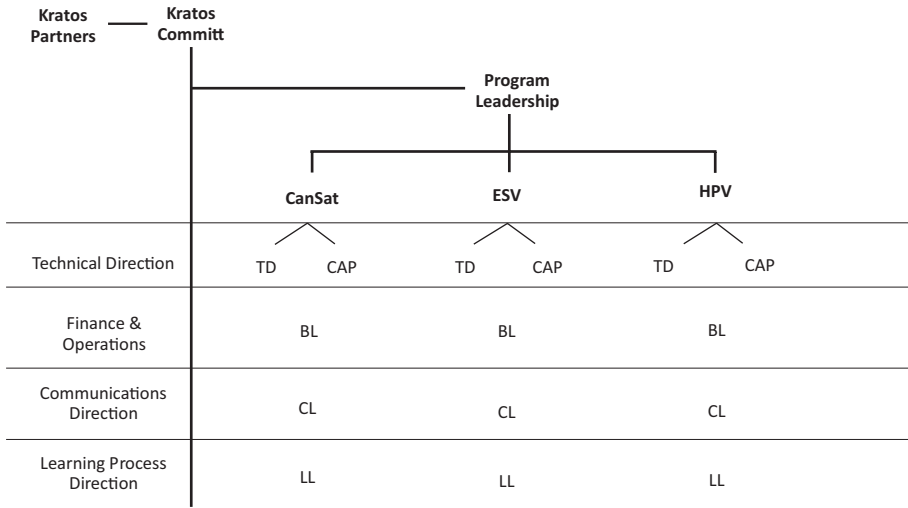


Fig. 14.1 Organizational chart, Kratos program

The program’s structure is replicated on a smaller scale in each project. At the start and during the development of each project, Kratos is organized into subsystems according to structure, knowledge, and performance requirements. Each team has its own organizational, operational, and working structure, but there is a set of roles that work directly with the Committee: Technical Director (TD), Captain (CAP), Budget Leader (BL), Communications Leader (CL), and Learning Leader (LL). It is worth highlighting that the platform currently comprises six projects with teams of 20–45 people, between students, mentors, and teachers. The purpose is to welcome as many students as possible and to put in place a harmonious working structure.

Three main projects were implemented during 2018: Kratos CanSat, Kratos ESV (electric solar vehicle), and Kratos HPV (human-powered vehicle). An overview of these projects follows.

Kratos CanSat

This project brought together undergraduate students from different programs, all of them space science enthusiasts, to build a tin-can-sized satellite and compete in the Global Space Balloon Challenge. This challenge consisted of using a high-altitude balloon or satellite to reach the greatest height possible within the stratosphere, perform in situ measurements, establish a communications link-up with the experiment, and return to land effectively. The competition is also an opportunity for developing near-space activities.

The satellite was launched in April 2018 from a Colombian Air Force Base and took into account the elements under evaluation, namely design and educational innovations. This team was made up of 35 students from different undergraduate programs at Universidad EAFIT. The team leaders were one full-time professor and one part-time professor, both of which had ample experience in the fields of experimental mechanics, electronics, telecommunications, and aerospace engineering.

Kratos ESV

This project worked on designing and building a solar electric vehicle that would compete at the iLumen European Solar Challenge in the cruiser category. This competition is a 24-hour resistance race where teams from different universities around the world and their corporate partners, together with 2 Tesla Model S automobiles, show off the potential of their solar electric vehicles in terms of energy consumption, aerodynamics, and design as they face off in a 24-hour test around the Zolder (Belgium) race circuit.

In September 2018, Kratos participated in this event with very good results in the aspects that were evaluated: Regularity, fast lap, Ko Chicane, technical innovation and number of laps. The team was made up of 45 students from different undergraduate programs at Universidad EAFIT, and its technical leadership was in the hands of an expert with ample experience in the development of electrical and solar vehicles.

Kratos HPV

This project was based on a competition to design and build the physical model of a human-powered vehicle without external assistance. In other words, the movement must only be generated by the pilot's pedaling capabilities. This challenge evaluates vehicle design, design report presentation, an oral presentation before a jury of the physical artifact, vertical and lateral loading capacity, the system's roll resistance, and mechanical resistance performance during an endurance track test. Kratos participated in the national competition at a University in Medellin during November 2018.

The team was made up of 47 students from the management, science, humanities, economics, and engineering schools. Its leader was a full-time professor with ample experience in the fields of mechanical engineering, manufacturing, communications, and working with groups of students.

Besides technical leadership, all projects had assistance from a committee responsible for validating compliance with specific milestones and for providing solutions to any mishaps or eventualities that might arise.

Multiple skills are required for developing this initiative. On a personal level, capacities for working under pressure, assertive communications, resilience, teamwork, as well as abilities for managing difficult situations played a critical role in project success. On the other hand, and on a professional level, real-life experience of classroom teachings, comparisons between theory and practice, autonomous learning and multidisciplinary are highlighted. The academic skills required include project management, logistics, budgeting, fundraising, design, conflict management, and marketing.

Experiential Learning Cycle

Developed based on the contribution of psychologists such as Piaget and Dewey, experiential learning contemplates a holistic model of the learning process wherein knowledge is generated through the transformation of experience (Kolb, Boyatzis, & Mainemelis, 2002).

In this sense, the experiential learning theory (ELT) pedagogical proposal maintains that (1) learning should be understood as a process, not in terms of results, (2) all learning is relearning, (3) learning requires solving conflicts between forms of adaptation in dialectical opposition to the world, (4) learning is a holistic process of adaptation, being the result of cognition along with the integrated functioning of the total person—thinking, feeling, perceiving, and behaving, (5) learning results from synergistic transactions between the person and their surroundings, and (6) learning is the process of creating knowledge (Kolb & Kolb, 2005).

In light of the foregoing, experiential learning is made up of a spiral cycle involving concrete experience, reflection upon experience, the formation of abstract concepts, and applying this reflection to new concepts (Kolb, 1984). In the specific case of the projects developed within the Kratos program, experiential learning theory (ELT) follows an ongoing, four-stage cycle, where (1) students actively carry out a project (concrete experience); (2) students reflect back on that experience (reflective observation); (3) students attempt to conceptualize a model observed in the experience, with the help of the faculty advisors (abstract conceptualization); and (4) the model is tested by planning and executing new experiences within the platform (active experimentation) (Kolb & Kolb, 2005).

Skills and Competences

Kratos arose from its creators' conviction that the technical knowledge imparted by the universities nowadays, using traditional teaching methods, is insufficient in and of itself to account for the success of graduates in the job market. Concurrently, it was detected that soft skills were becoming increasingly more important for employability in today's companies. Soft skills are usually referred as employability skills and are related to an individual's perceptions of the present and future conditions and how they expect to deal with positive or negative circumstances (Rothwell & Arnold, 2007).

According to the Confederation of British Industry, employability is "a set of attributes, skills, and knowledge that all labor market participants should possess to ensure they have the capability of being effective in the workplace—to the benefit of themselves, their employer and the wider economy" (2009). Likewise, several researchers have defined employability in different ways. Garavan (1999) refers to it as "the new form of psychological contract between employers and employees". Harvey (2004) explained it as "the ability of the graduate to get a satisfying job". Another definition of employability is "the capacity and the willingness to be and to remain attractive in the labor market, by anticipating changes in tasks and work environment and reacting to these changes in a proactive way" (de Grip, van Loo, & Sanders, 2004), while others have referred to it as "a form of work specific active adaptability that enables workers to identify and realize job opportunities" (Fugate, Kinicki, & Ashforth, 2004). The bottom line is that employability is the shared responsibility of both employer and employee (Clarke & Patrickson, 2008).

As regards employability skills, the Conference Board of Canada (2004) defines them as the ones a person needs to possess to enter, keep, or progress in the working world. Employability skills are basic transferable skills that represent essential functional abilities and enabling knowledge required to have success at all levels of employment in the workplace in the twenty-first century (Overtoom, 2000). Others refer to them as "a set of achievements, understandings, and personal attributes that make individuals more likely to gain employment and to be successful in their chosen occupations" (Yorke & Knight, 2004).

Understanding attitudes regarding these skills is important because education and industry appear to operate under different systems and because it has been found that employability skills predict the potential for professional advancement (Rosenberg, Heimler, & Morote, 2012). According to Richens (1999), even if a collaborative process existed between education and indus-

try, the structure of education has hindered the implementation of systemic change. On this matter, Duzer (2006) pointed out that the educational system, with its foundations in a nineteenth-century structure and a linear pedagogical process, is not capable of satisfying the needs of the current global economy. In this regard, a need exists to integrate other teaching approaches in the learning process so different entities (employers, academics, government, employees, and students) can participate in developing and improving employability skills. This is the foundation of the Kratos program.

Employers have maintained that their greatest needs are for soft or employability skills. Some authors have even stated that if nothing is done to improve educational performance, the gap between the skills required by the industry and the abilities received by graduates will continue growing (Plastrik, Seltzer, & Taylor, 2003). Besides, Robst (2007) emphasized that more general transferable employability skills provide individuals with abilities that allow them to enter the workforce, perform jobs, advance their careers within companies, and change job positions within and between industries.

In 1991, The US Labor Secretary's Commission on Achieving Necessary Skills (SCANS) identified that students believed that employability skills are learned through doing, and through participation in extracurricular activities (US Department of Labor: The Secretary's Commission on Achieving Necessary Skills (SCANS), 1991), and later on, Rosenbaum (2002) declared that if students do not learn basic employability skills before being hired, they may not have the opportunity for learning them at work, as employers may be reluctant to invest the resources required to provide corrective training for these abilities. McMasters (2004) even stated that there is an "ignorance of industry needs from a university perspective" (McMasters, 2004, p. 368).

An inventory of the employability skills and the different classifications proposed by the literature, returns that these skills can be classified as follows: Critical thinking skills, leadership skills, management skills, interpersonal skills and self-perceived skills (Lankard, 1990; Misraa & Khuranab, 2017; Schermerhorn, 2008; US Department of Labor: The Secretary's Commission on Achieving Necessary Skills (SCANS), 1991). Several researchers have observed that employers describe the latter of these, together with work habits, as more important than academic abilities (Bracey, 2007; Carnevale, Gainer, & Meltzer, 1990; Rosenbaum, 2002). Rosenbaum suggested that "it is these skills that are sometimes considered to be the best predictors of job performance" (Rosenbaum, 2002, p. 10).

As stated before, companies and academia have pointed out that a gap exists between the attributes of graduates and company requirements in terms of skills or competences (Amen, 2014; Gazier, 1999; Nair, Patil, & Mertova, 2009;

Osmani et al., 2015; Plantilla, 2017; Plastrik et al., 2003; Rosenberg et al., 2012). There is a clear need to improve these soft skills in university contexts and the techniques used to do this include case studies, role-playing, business games, corporate analysis, and group discussions, among others (Rao, 2014). Universidad EAFIT has prior experience with precise and specific experiential learning projects (Escalante & Uribe, 2015), but these were isolated and the skills developed and processes undergone by students were not monitored from their inception. Kratos was created as a program founded on experiential learning premises, which would comprise projects with participation from students and faculty from all disciplines, with the sole purpose of developing employability skills. What the program does is to facilitate student enrollment in international competitions with the goal of fostering their potential.

Based on the extant literature on experiential learning, the Kratos committee posits that competitions are a good scenario to develop the students' soft skills such as the ones measured by the program, that is, those related to the self-perceived skills category mentioned above and to attitudes toward knowledge and skills development. Specifically, previous research has shown that experiential learning and student competitions that require design activities may enhance creativity (Ayob, Hussain, Mustafa, & Shaarani, 2011) and passion but can also have negative emotional consequences (Schuster, Davol, & Mello, 2006).

Creativity, in an organizational context, refers to the generation of novel and potentially useful ideas (Woodman, Sawyer, & Griffin, 1993), and as such, it is considered a process through which ideas are conceived, and therefore, it is when reinvention and redefinition take place with the underlying purpose of finding original solutions (Stokes, 2011). For Kratos, creativity is a fundamental competence, as it refers not just to the creation of new devices but also to resourcefulness for solving problems. This plays a fundamental role in overcoming obstacles and is necessary for situations that require novel solutions (Marguc, Van Kleef, & Förster, 2015; Mumford, 2003). In this regard, the literature alludes to the efforts made for developing approaches that will systematically improve student creativity, including innovative teaching techniques (Brent & Felder, 2014), creative design heuristics (Daly, Yilmaz, Christian, Seifert, & Gonzalez, 2012), and workspaces for fostering new ideas (Halverson & Sheridan, 2014).

Kratos projects are highly demanding in terms of time and effort. They require commitment, responsibility, and a lot of passion from their participants, and, consequently, job tension is also monitored as a soft skill. Job tension or job-related stress arises from an interruption of an individual's cognitive-emotional system and/or natural balance by external demands

within the working environment (Lazarus & Folkman, 1984). Over time, this tension can have negative effects on people's mental and physical health (Ganster & Rosen, 2013) if it is not detected and treated. Additionally, job-related stress influences people's results and levels of satisfaction, as a result of the exhaustion of their mental and physical resources (Demerouti & Bakker, 2011; Mackey, Perrewé, & McAllister, 2017). Evidence indicates that physical health, psychological well-being, and work satisfaction are related (Dewe, 1991). The literature also mentions that excessive workloads, ambiguous roles, changing technology, financial pressures, and stakeholder demands are some of the most frequent and significant causes of stress (Wang, Mohd-Rahim, Chan, & Abdul-Rahman, 2017). In Kratos, these causes of stress are present, so performance under job stress is a soft skill that is expected to be developed by actively participating in the projects.

The term resilience is nothing more than contemporary jargon for what earlier generations of psychologists labeled ego strengths. The idea of a resilient individual brings to mind an invulnerable person or a survivor and is highly related to adaptation to change and motivational control. In this regard, the concept refers to an individual's dynamic capacity for modifying a characteristic level of ego-control, as demanded by the context they are immersed in, so as to preserve or enhance system equilibrium (Block & Kremen, 1996). In other words, it is related to the ability to change from and also return to the individual's characteristic level of ego-control after a temporary accommodation-requiring influence occurs. The ego-resilience construct, which is referred to by this learning metric, is an employability skill that indicates "the linkages of the ego structures that keep the personality system within tenable bounds or permit the finding again of psychologically tenable adaptational modes" (Block & Kremen, 1996, p. 350).

People's creativity, resilience, pressure management or job tension, and emotional control levels differ. This is why these competences are analyzed at the start and end of Kratos program projects, to account for their development.

The term "Emotional Intelligence" was first coined by Salovey and Mayer (1990) and is based on the theory of intelligence from the 1920s where Thorndike (1920) insinuated that there could be other types of intelligence other than the merely cognitive known as intellectual intelligence (IQ). Later on, the multiple intelligence theory was proposed (Gardner, 1993), introducing seven different kinds of intelligence. These seven intelligences include interpersonal intelligence, defined as the capacity for recognizing differences in emotions, characteristics, motivations, and life purposes in individuals (Gardner, 1993). It was on this intelligence that Salovey and Mayer based their work on emotional intelligence by also relating it to social skills.

Emotional intelligence focuses on emotions and moods and how an intelligent person reasons based on them (Matsumoto & Hwang, 2012; Salovey & Mayer, 1990). There are many definitions of this concept, including the one that gave rise to it. All of them share the understanding that emotional intelligence includes awareness, knowledge, regulation, and management of one's own and others' emotions (George, 2000; Martínez, 1997; Mayer & Salovey, 1997; Prati, Douglas, Ferris, Ammeter, & Buckley, 2003; Salovey & Mayer, 1990). Apparently, the development of this concept is rooted in the difficulties of measuring rational thinking to predict success in life (Dulewicz & Higgs, 2000; Goleman, 1998; Salovey & Mayer, 1990). This means that IQ was insufficient for doing so.

There are two approaches to the concept of emotional intelligence. While Salovey and Mayer (1990) viewed it as an ability, Goleman (1998) and Bar-On (1997) considered it a personality trait. The difference lies in the fact that the personality trait perspective considers that emotional intelligence is an "innate characteristic that enables and promotes well-being" (Harms & Credé, 2010, p. 7). Alternatively, the ability perspective considers it a tool for comprehending and regulating emotions and for understanding and integrating them into cognition (Harms & Credé, 2010), and that, therefore, it can be developed. Within this context, emotional intelligence is considered ability, and is defined as a "subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (Salovey & Mayer, 1990, p. 189).

In Kratos, creativity, job tension, emotional intelligence, resilience, and teamwork are measured at different points of time in students that participate in the program's projects. Projects go from building and competing with satellites, solar electric vehicles, and human-powered vehicles, to contending in business case competitions and computing challenges.

Optimal Fit

University-based undergraduate programs form the ideal context for Kratos' operations because this is where students, besides acquiring technical and disciplinary knowledge in their different career options, prepare for immersion into the job market. In graduate programs, students already have jobs, and this context requires different actions by the university to strengthen employability competences. Besides, the spirit of Kratos lies in voluntary, extracurricular participation by students, no matter their grade average, semester, or

prior knowledge, as the purpose is to learn by doing and that students go beyond their obligatory assigned curricular roles (extra-role performance).

The nature of Kratos projects is attendance-based, and teams are set up according to the needs of the competition and the required technical specifications. This has an effect on the size of the team, the subsystems, and the assigned roles. Besides, each project demands specific resources and technology and, therefore, specific budgets and timetables. Learning measurement is then planned according to the specific nature of each project, in terms of time and human resources.

Challenges

Time constraints are different depending on the programs the participants are enrolled in. Thus, their performance will be affected by the time available. In this regard, although the learning measurement model is the same for the entire program, and the competences to be developed are the same in all projects, a specific measurement timetable must be planned for each project, and the 360-evaluation must be adjusted to the structure and role determined for them.

Participants enroll voluntarily making it difficult to discern the extent to which the participation in the project truly fosters their learning processes. An experimental design will help disentangle whether, besides motivational factors, experiential learning activities boost student's skills and professional competences. An impact study was initially proposed for this matter, but an experimental design requires implementing it simultaneously throughout each project's duration.

Students often do not realize the importance of measuring skills, competences, learning processes, and performance. They seem to focus on the project (i.e. solar electric vehicle, balloon) and sometimes complete surveys in an unconscious manner. This can affect the measurement of the learning processes.

Since participants are volunteers, it is not possible to offer them incentives. In real-life/work situations, employees receive monetary and non-monetary incentives. Certain actions have been performed, such as offering them the opportunity to use the work done in Kratos to validate another complementary or elective assignment from their programs, with approval from the Coordinator. In any event, this challenge requires thinking of possibilities to include experiential learning activities in curricula of the university's undergraduate programs.

Evaluation of Learning Effectiveness

Assessing training effectiveness in Kratos entails using the four-level model developed by Donald Kirkpatrick (1994). These levels are (1) Reaction, (2) Learning, (3) Behavior, and (4) Results. The first level (reaction) measures how students (the people being trained), react to the training, whether participating in the project is a valuable experience, and what their perceptions are about the instructor, topic, materials, and all the support provided by the program. Reactions are measured to understand how well training is received and to improve training for future students. For this aspect, both the logbook and focus group methods are used.

At the second level (learning), training is measured in terms of what and how much students have learned. For this, four soft skills were identified as the most important for students to develop, with Kratos being a program that focuses on the development of employability skills. To measure these, a longitudinal model was designed allowing skills to be measured at the start, during and after training. This level uses tools such as impact studies, scales, and metrics to account for the learning process.

The third and fourth levels are the most challenging because time, budget, and human resources are needed to measure behavior and results effectively since both levels take place months or even years after the initial training. To evaluate how much student behaviors can change based on the training they received, it is necessary to have performance information from their respective professional environments. And to measure the results of Kratos projects including outcomes, benefits, or final results and how they are linked to the training, long-term actions need to be taken to closely follow indicators such as employability, employee retention, employee performance, and income levels, among others, compared to those that did not receive training.

The Kratos program has a team in charge of the learning process called learning process direction. This team gathers both qualitative and quantitative information throughout the process of putting together the teams, and planning, building, and developing the projects. Data is gathered using different methods and is in turn used to measure effectiveness. The following are the different sources of information and tools used for measuring learning:

Log books: Project leaders fill out a logbook every two weeks containing the main problems faced, the solutions applied, the lessons learned, incoming and outgoing members and their reasons for joining or leaving the teams. Additionally, the logbook has space for registering the actions implemented for fulfilling the projects' main goals and deadlines in terms of resources, deci-

sions made, and roles assigned. These logbooks are the main source of information for a qualitative analysis of the learning processes and project effectiveness, and they help interpret the quantitative data gathered with other tools.

Focus groups: Focus groups are implemented at the beginning and end of the projects to have conversations with team members, especially students, with the purpose of eliciting their feelings, perceptions, and opinions about the process. This is another input for a qualitative evaluation of the program's effectiveness, carried out by mentors and a psychologist responsible for analyzing the information recorded in the focus groups.

Impact study: Pairing model research was designed with the purpose of identifying pairs of project participants who are not part of the team. Certain students are identified based on non-measurable characteristics such as sex, age, social categorization, and the school they come from, and then a survey is applied to them to compare their results with the control group (Kratos team) and determine the impact of participating in this experiential learning processes, compared to those that do not.

Scales: One of the program's main objectives is to report on the learning process of the students participating therein. With this in mind, mentors searched for the optimal instruments that would measure the soft skills the program intended to develop. Several scales were chosen because of their sound psychometric properties to be applied to students, and a longitudinal design was set up for them by means of a timetable containing monthly measurements at the beginning, and every two weeks toward the end. Four skills in total are measured, using the following scales:

1. Creativity: Scale by Zhou and George (2001)
2. Perceptions of Job Tension: Scale by House and Rizzo (1972)
3. Resilience: Scale by Block and Kremen (1996)
4. Emotional Intelligence: Scale by Lopez-Zafra, Pulido Martos, Berrios Martos, and Augusto-Landa (2012)

These scales were back translated using three official translators to come up with a final version in Spanish. This version was validated in a pilot test with approximately 250 students, the number that heeded the call to join the program in mid-August 2017. This validation was performed so as to apply the survey in a Colombian context and in their native tongue, Spanish.

A measurement timetable was defined for each project, taking into account the project start and end dates. The unit of analysis is individual, and all are self-reported. Analyses to be performed use statistical procedures including

EFA, CFA, MANOVA, structural equation analysis (SEM) and longitudinal analysis and comparing models to report on the learning process of all students involved.

360° metrics: An additional quantitative metric is used to complement the information and reduce the self-serving bias of having all self-reported measurements. This scale specifically measures team skills in a 360° scenario. The scale is implemented as follows: (1) the team leader, along with each subsystem leader, evaluates each team member, (2) subsystem leaders evaluate the general team leader, (3) each team member evaluates one peer, and (4) self-evaluation from every team member. The scale used is a back translation of Strom, Strom, and Moore's (1999) instrument.

Feedback from sponsors and allies: Sponsors are heavily involved in the process and constantly come by to observe project progress and performance. They provide ongoing feedback to the Kratos Program Director and express their satisfaction and expectations regarding results, seeing the impact made on students in terms of personal growth, competence development, discipline, and motivation.

All allies decided to collaborate with Kratos because of the impact the program could make on the students and on society, and because, with their participation, they can help students build their potential, learn by doing, develop their skills, and make their dreams come true. Sponsor and ally satisfaction, and their manifestations of no regrets, are also measures of effectiveness.

Transferability/Replication

It is expected that the competences developed through participation in Kratos projects will materialize at the workplace and positively complement the knowledge acquired by students during their time at the University. This transfer can be evidenced by following up student performance once they have graduated, in their jobs, through their immediate superior or performance evaluations. This, in turn, constitutes an impact measurement for the Kratos program.

The authors trust that the program, its design, and operation, together with the findings resulting from the data analysis, will have applicability beyond its own borders. The point here is that employers are likely to look for the same types of skills in different labor markets, so the multidisciplinary approach of Kratos makes no distinction between the program the students are enrolled in and the discipline they study. The model Kratos has put together can be replicated in other institutions but customized to their specific context (resources).

The findings of early studies have been influential and were used as a springboard to shape the parameters of this program. After having framed the basic employability skills, we expect to determine the size of the skill gap among college undergrads, faculty, and employers.

Having all processes formalized and written out facilitates replicating this initiative in other context, and the leadership structure designed for the program and which provides support for all projects, namely the committee, provides transversal provision to the way of doing things, because several aspects such as team configuration, role assignment, viability studies, budget execution, and media plan execution, among others, are implemented in the same manner for all projects. The Kratos image, for example, is the same for all projects. This is also true for merchandising, presentation templates, and social media posts.

Another aspect that facilitates program transfer and replication is that Committee members are also employees of Universidad EAFIT meaning that internal processes and required procedures flow more easily. Students have institutional support and assistance through their teachers and, therefore, participation in the different projects is considered a representation activity.

Debriefing

At the end of each Project, a closing session is held to receive feedback for the process from all participants. In here, all students who successfully participated in the projects receive at the end a certification they can include in their portfolios. Although records are kept of all the activities performed, and the entire process is followed up, the closing session is a space where, without the pressure of competition and with a retrospective point of view, students, and professors can evaluate lessons learned and areas for improvement. With the areas for improvement identified and the suggestions made by participants, the Kratos Program designs an improvement plan with corrective, preventive, and improvement actions for all projects.

Feedback about performance is given to each student based on commitment, results, and attendance to the projects' activities. This is given by each project's technical director and based on the logbooks and observation. Quantitative feedback about the results of the surveys is made when data analysis is finished. Longitudinal studies require having all measure moments collected and information crossed. Once this is done, the Committee shares a written report to all students in an aggregated manner, to preserve the anonymity of participants.

Focus groups, as a measurement strategy, are a valuable source of information for the program, as they give rise to learning-centered discussions and allow gathering insights on the team and collaborative work performance.

In other areas, an important task performed by the Committee is formalization of all processes, as this allows for clear rules-of-the-game when recruiting students, configuring teams, designing structures, drawing up media plans, managing communications and relationships with different stakeholder groups, implementing project and budgets, and, of course, achieving a final project and competing.

One aspect that should not be forgotten is that fluid communications must be maintained at all times with sponsors and partners, as the support received from them is realized through the media visibility provided them by the Kratos program as well as the brand consolidation expected from the image projected by Kratos' participation in different competitive scenarios.

The instructors that accompany projects are constantly aware of student activities, of the role they play within the team, and whether they are attending to their curricular obligations, as it cannot be forgotten that participation in Kratos is of a voluntary and extracurricular nature. Likewise, this assistance allows them to attend to situations that arise during the course of each project or solve issues that arise normally and that could hinder schedule fulfillment or resource execution, and, ultimately, team performance.

Implications

There is an urgent need to transform or move from rote learning to reflective learning practices, as the current state of employability skills in Colombia presents a difficult panorama, not just because of low employability rates, but also because of the current inability for meeting employment criteria defined by employers due to a detected skills gap.

The implications of this study will be useful for guiding both the industry and academia on how to incorporate and improve employability skills among professionals. In the future, the requirement will exist to integrate available employability models into the curriculum, and into organizations, to close the gap between skills held and skills required by the industry, such that an appropriate solution can be provided for the same.

Kratos structure and form of operation could serve as a reference point for replicating it in other educational environments, besides, as it is an initiative that integrates several disciplines, involving students and professors, and also promotes collaborative work with the industry and the government.

The impact of the program is also in internationalization. The contests Kratos participates in are of international nature. Also, the projects follow procedures and rules of international standards, and the program, as an experiential learning platform, has been socialized in international conferences and publications such as the Global Business School Network (GBSN) Annual Conference, Frontiers in Education (FIE) Annual Conference, International Conference on Higher Education Advances (HEAd), and European Foundation for Management Development (EFMD) Annual Conference.

As for visibility, the University has been positively impacted by Kratos performance and good results obtained. Thanks to the media ally, the program has reached more than 3 million people in the country through different means such as radio, television, newspaper, and social network. The website www.eafit.edu.co/kratos contains important information such as the description of the program, the projects it covers, and its main achievements.

Theoretical Contributions

Kratos applies educational methodologies that are being explored at Colombian universities. Although challenge-based learning and experiential learning have been amply studied in developed countries, not much academic literature can be found on these topics for the Latin American context.

The implementation of a program that applies new teaching methodologies in the Latin American context and the measurement of lessons learned, contributes in different ways to the academic literature related to education.

In the first place, applying challenge-based and experiential learning in the Colombian context allows validating whether experiential education methodologies are applicable in emerging countries. In the second place, the research carried out by Kratos allows providing an empirical contribution to how challenge-based learning and experiential learning impacts work training for undergraduate students. And, finally, the Kratos program intends to provide evidence for how multidisciplinary work can provide better results regarding the development of soft skills.

Kratos has documented the manner in which the ELT (experiential learning theory) pedagogical proposal can be applied in a university environment in Colombia. Besides, the excellent results obtained by Kratos in the competitions where it has participated, allow inferring that the students in the program are obtaining and potentializing soft skills in an adequate manner.

Although the results of Creativity, Perceived Job Tension, Resilience, and Emotional Intelligence have not been finalized, the good results achieved in the competitions in which Kratos has participated are indicators that cannot

be ignored. Outstanding results have been achieved in all the competitions Kratos students have participated in: Second Place at the National Case Competition, Universidad de los Andes, 2017; First Place at the Best Photo and Best Design at GSBC 2018; Fourth Place at the Cruiser Category, Ilumen European Solar Challenge 2018; and First and Third Place at the National VTH Championship 2018.

Said results account for the correct appropriation of soft skills by students and, therefore, the correct application of the ELT model within a university context in Colombia. This has an impact on the improved performance of individuals and work teams. Regarding data analysis, provisional results account for the fact that skill development is a process that takes time and effort and that to measure learning, experimental, and longitudinal models need to be used to identify growth and impact curves for the learning methodology.

Pedagogical Contributions

The Kratos program, through its experiential learning or challenge-based learning programs, facilitates the development of soft skills, by confronting students with activities that have real performance impacts. Having to manage budgets, plan activities and resources, manage projects, build artifacts, assign roles, manage personnel, design communications plans, relate with sponsors and partners, work in teams and solve day-to-day situations, among others, in non-simulated spaces, means that the consequences of all these actions have real-life effects, which they will eventually come up against in their future jobs. Besides, facing off against other teams in different national and international competitions provides them with cultural exposure and healthy competition, where they deploy feelings of competition, anxiety, pressure, among others, and where it is necessary to use competences like creativity, job tension management, resilience, emotional intelligence, and teamwork.

The multidisciplinary nature and diversity of the participants also mean that they need to find ways to work together collaboratively with their team members to learn from them and complement their skills.

Once again, the students' passion and their desire to win in the different competitions increase student engagement with the projects. They employ additional study hours to contribute to their tasks and perform their roles, and to general project development. This implies a challenge for teachers, as the intention is that students participate actively in Kratos, without neglecting their academic obligations at the university. The good results achieved by the different projects are considered recognition of the students' efforts, who, with great satisfaction, state that they are proud to belong to the Kratos program.

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Sara Aguilar-Barrientos holds a PhD in Strategic Management, a master's in management science and a BA in international business. She is Academic Coordinator for the undergraduate program in international business at Universidad EAFIT. Her research interests are in international HRM, intercultural management, teaching in international business and international management.

Alejandro Arias-Salazar holds a master's in marketing and a BA in product design engineering. He is Academic Coordinator for the undergraduate program in marketing at Universidad EAFIT. His research interests are in branding and marketing.

Juan Esteban Escalante holds a PhD in strategic management, a master's in project management, an MBA, and a BA in production engineering. He coordinates the Master in Business Administration (MBA) program at Universidad EAFIT. His research interests are in logistics, operations management, and experiential learning.

Jaime Barbosa holds a master's in engineering and a BA in mechanical engineering. He is on the faculty of the Mechanical Engineering Department at Universidad EAFIT. His research interests are in physics, mechanisms, and education.

Manuel Esteban Acevedo-Jaramillo holds a master's in economics and a BA in international business. He is the former Dean of the Business School at Universidad EAFIT and is President of ICETEX under the Colombian Ministry of Education. His research interests are in economics, negotiation, and education.

Juan Pablo Román-Calderón holds a PhD in organizational and work psychology, a master's in management science, and a BA in psychology. He is faculty in the International Business Department at Universidad EAFIT. His research interests are in organizational psychology, statistics applied to social sciences, and health psychology.