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EXAMINING THE IMPLEMENTATION STRATEGIES WITH COMMUNITY-BASED IMPACT APPROACH AND THE THEORY USING RESEARCH TO PRACTICE REGARDING PROJECT-BASED LEARNING IN ENGINEERING AND AVIATION EDUCATION

Harry Godwin, University of Maryland Eastern Shore, USA (hugodwin@umes.edu)
Sean Irwin, University of Maryland Eastern Shore, USA (sirwin@umes.edu)
Willie L. Brown, Jr., University of Maryland Eastern Shore, USA (wlbrown@umes.edu)
Ibibia K. Dabipi, University of Maryland Eastern Shore, USA (ikdabipi@umes.edu)

ABSTRACT

The study supports the strategies of research-to-practice on the design implementation to assess project- based learning (PBL) in engineering and aviation education to promote community impact in teaching. This approach introduces a critical design and the requirements to align learning outcomes in key discipline by building on problems identified within the community practices. Thus, the study reflects on a systematic approach to determine how the PBL could determine the various applied practices and performance requirements. Hereby, the objective is to align industry requirements and community needs with academic standards and education outcomes for development. This approach allows for the teaching practices to connection with set parameters and perform activities according to desired learning objectives and requirements provided from industry. The research-to-practices also addresses the factors involving engineering and aviation education by promoting the value of PBL and community impact in teaching strategies. These efforts are studied to deliver a strategic plan for implementing and using lifelong learning with data analysis to determine project results and accomplished tasks for overall effectiveness in the field of practices. Successively, the understanding of course performance practice of the results and learning relationships among the community in space science project and the findings to enhance PBL methods for comprehension of learners.

Keywords: Project Based Learning, Community Impact, Aviation Science, Engineering Education, Space Science Research,

1. INTRODUCTION

The examination of project-based learning methods to advance commercialization of space travel has been a nonviable mission for the aviation industry since the early 2000s. The advancement of learning to determine the community impact has brought about several research bodies and organizations such as SpaceX, Blue Origin, and many more. Influenced by the vast cost associated with traveling into the earth's atmosphere, also with other economic factors, human safety will be a primary drive to this research. This research will develop a methodological process in which the commercialization of space transportation can be achieved. Space station is the next age of exploration for tourists. This dream will aim at providing services for humans to access and experience space for adventure and recreation. The United Nations World Tourism Organization (UNWTO) defines tourists as people who "travel to and stay in places outside their usual environment for more than twenty-four hours and not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited" (Annadurai et al. 2011).

Technically, the study of exploring space will be about intangible benefits, such as community impact using educational goals. The evolution of space tourism originally began with a non-professional astronaut Denis Tito regarding paid for his trip to space in 2001. Although the flight was by a government spaceship, he paid privately for his part. Further progress on space exploration was technology-related like the recent launch of SpaceX trio spacecraft's Lunar Mission, which included a lander bound for the Moon, created a door for growth within the spaceflight industries and education research. The success of this mission has brought about several research bodies

and organizations such as NASA, SpaceX, the Air Force, Space Force, and other spaceflight industries to consider education practices.

Space exploration today is restricted to adventures and recreation opportunities in space stations, but they remain related to earth properties. Such related earth-based opportunities help to increase market potentials for growth in space tourism by marking space customers crave for real space experience. Using current statistics from market trends; it is clear that there is a huge potential market for space exploration. Space travel will evolve through several phases like the adventure tourists. With the potential growth in actual space tourism, adventure tourists will explore space by paying several millions of dollars for space travel and thereby stabilizing into a well-developed tourist market. With market surveys average (80%) of people between the age of 20 and 29 will be interested in space travel. The space tourism industry will represent 10% of the world's economy (Reggestad et al., 2000). One of the biggest strengths of space exploration will be the strong economic rationale bonds between governments and private firms.

2. SCOPE

This commercial aviation space travel will be moderately practiced by intense brainstorming and process which this research project will provide. Considering the stiff condition of space exploration, the duration of travel may be modified to a nominal duration of 15minutes to 7days depending on the flight level be it an orbital or suborbital. The beginning scope of this research will be a thorough analytic review description of economic safety procedures involved with space travel. The advancement of space technology in the reusability of launch vehicles is the key element in the realization plan. Although spaceships are complex, labor-intensive, expensive, and partly only reusable to create, also with low safety records, with NASA decision to end space programs, low-cost access to space can be the next big thrust program (Annadurai et al., 2011).

Therefore, the project findings discovery a potential study with the cost and promoting factor of this service in research for engineering and aviation education. Although the market of space industry is projected to be expensive, it is also expected that the industry could grow to be an economic important sector to society. Space travel is likely to grow into the largest commercial activity in the industry if it can be advertised on how to impact humanity. Then a satellite base IoT (Internet of Things) technology will be illustrated on the impact of space exploration. This system encourages companies to rethink their approach to businesses, industries, and markets, hence empowering them with tools to improve business strategies.

3. LITERATURE REVIEW

Space transportation is still an expensive industry, which only the USA space programs also with the Russian Soyuz capsule can carry out such activity (Annadurai et al., 2011). Efforts to expand the range of human travel are still a nonviable mission for the aviation industry today. Provoking challenges such as engineering limitations, high temperature withstanding structures will have to be overcome before the commercial space industry will begin to lead to a drop-in price. The recent successful trio spacecraft's Lunar Mission of SpaceX, which was carried out by the Falcon 9, marked the third successful touchdown of this rocket. Elon Musk who is the CEO of the SpaceX company also noted that "it would fly again in April, performing a key test flight of the company's new Crew Dragon capsule". If the success of this mission happens, the Falcon 9 booster will be the first to go to space and back 4 times, proving its reusability economic quality (Gush, 2015). NASA also plans to limit the cost per launch vehicle to around $6,000 per kg payload, which is much less than the current $20,000 per kg (Pelt, 2015). Though mega-companies would be able to afford this, it's still far too expensive for a private firm.

Third-generation spaceships are expected to start functioning from around 2025 (Pelt, 2015). Space travel in this generation will still be quite expensive, but the flight will be at a reasonable price for the adventurous individuals who save monthly or yearly of average income for their desired journey. Furthermore, looking into future times, the journey to space station for less than $50 per kg, alongside some possibility for mass space tourism, is hoped in the fourth generation. The fourth generation would be the most cost-efficient primarily due to reusable launchers and this will be operational around 2040 (Pelt, 2015). This generation of spaceships is envisioned to be airplane-like, air-breathing vehicles that would be based on new super-light materials, also a rocket engine is to become more efficient, and will require less maintenance than a modern airliner.

3.1 Community Impact with Safety Measures and Regulations

In the United States, space plane activities by orbital or beyond earth atmospheric destinations are all subject to the rules of the Federal Aviation Administration (FAA) (2021), which certifies all passengers launch vehicles and license aviation companies. The extension of FAA regulations for space planes was established to ensure the reliability of the spaceship operators and systems for the safety of passengers. This FAA regulation enhances the importance of commercial safety standards from personal interest. They also supervise Air and Space Traffic Controls during flight with Order 8000.1; The order is entitled Safety Management System Doctrine (Federal Aviation Administration, 2021). Though there are several regulations of FAA guiding air travels, new regulations are needed notably to ensure public safety, also with its insurance firm to be efficient. Thanks to the office of commercial space transportation in the FAA, which is already working in this direction, also the extension of air traffic control to Earth Orbit, and medical guidelines for space travel (Federal Aviation Administration, 2021).

Tourist exposure to microgravity when flown to earth suborbital is short, thereby causing fewer advert effects on human endovascular, extravesicular, and musculoskeletal systems (Annadurai et al., 2019). Also, the effects of radiation and space motion sicknesses are limited due to the short-term nature of the flight. Passengers' medical standards will be based on commercial airline pilots and astronaut pilots, considering the maximum radiation exposure limit. Radiation is everywhere. It does not only come from the space atmosphere, but also out of the grounds on Earth. The average dose of radiation-emitting up from the surface of the Earth is approximate 2.6 milli-Sieverts per year (Pelt, 2015). Spaceships are shielded from this normal background of radiation by dense metal materials, also water tanks. However, there is a limit to this, else the spaceship would become too heavy to launch by rockets. People working in nuclear firms are allowed an annual dose of 10 times higher exposure than the normal exposure on Earth (Pelt, 2015). If this is used as a standard for space travelers, space tourism would result in a duration of 10weeks per year. This is an average of an annual holiday session. A journey exploration to Mass will probably require a high safety level close to that of today's airlines, otherwise, the market will be too small. Not many people will not want to make a journey that is more dangerous than flying on an airline. More so, prohibitable fees would be very high.

According to the vast growing work on the development of passenger space travel industry shows potential great economic value. Substantially funding for this subject will be a desirable variable for many points of view such as economically, socially, politically, also internationally. Surveys by the United State, Japan, Canada, England, and Germany all has a similar pattern, with most people being keen to visit space (Daniel et al., 1997). Space travel seems to be the nest probable popular service for the 25th century, just as air travel service grew in the 20th century. Because of the growth and globalization of the world's economy and financial system over the past 100 years from air travel which started in 1903 to reach its turnover of $1 trillion per year, space travel might reach that figure within 50 years (Daniel et al., 1997). In recent years, some mega-companies are competing on their first mission to Mars, by testing with launching unmanned rocket into the space station. As a successful launch of mission vehicles into their intended orbits, the growth of space tourism tickets is beginning to lead to a drop in price as soon spacecraft rocket is presumed at a reasonable level of carrying the human body. Economically, public space travel and tourism will be most attractive for 25th century space activities. It has the potential of growing into a viable business venture, and a major economic factor as many people are interested in going into space. A recent market study by Furtron Corporations shows us how commercial space tourism could generate over $1 billion in revenues by 2021 (Pelt, 2015). A good promotional campaign stunt like flying celebrities and famous people into space should be increased.

3.2 Project Based Learning and The Application of Internet of Things (IoT) In Aviation Regarding Community Impact

The internet of things (IoT) connects several devices to the internet and involves the use of billions of data points, all of which need to be secured (Gillis, 2019). There are numerous real-world applications of the internet of things, ranging from consumer IOT and enterprise IOT (supervisory control and data acquisition) in manufacturing and industrialization. IOT application snap comprises numerous verticals, including automotive, telco, energy, and more which could be implemented in SCADA of space technologies, thereby creating a more sophisticated and secure area in the space atmosphere. Imagine including the IOT technology in tourist spacesuit with software that collects and analyze tourist information and send messages to space airlines about the tourist. This technology will primarily be aimed at ensuring safety and comfort.

Though poorly secured, the IOT devices can be easy to attacks. IOT technology will primarily be controlled by the FAA with a satellite monitoring network. There is no shortage of IOT market estimates. Indicated survey from Brain & Company expects an annual IOT revenue of hardware and software to exceed $450 billion by 2020, also by market believes that the number of connected IOT devices will increase 12% annually to reach a sum of 125 billion in 2030 (Gillis, 2019). As much as terrestrial technologies can be cost-efficient on the device front, setting up an IOT is quite expensive to the point where it can only make sense financially in the most densely populated areas. With the projected mission of Blue Origin to launch a Canadian company's (TELESAT) internet satellites in 2021, the barrier of IOT covering only about 2% of Earth's surface will achieve (Gillis, 2019). In addition, several other space companies like SpaceX and One Web are involved in this race, thereby developing a functioning global space internet for tourists.

Space tourism will soon become a reality of time if the barriers of preventing space travel like financing of the development cost of launching spaceships are eradicated. Technologically, from the recent launch of rockets like the Falcon9, there are no major concerns in the development of spacecraft for space tourism. Space tourism also plays a vital role in the future of this industry, because they represent a huge market (Annadurai et al., 2011). They provide the necessary launch volume to achieve cheap access to space, because according to the law of demand, whereby an increase in the rate of demand increases, the price of good decreases. For space tourism to become a visible commercial venture, private aerospace development companies will be a starting point (Annadurai et al., 2011). Over the last two decades, there have been a great upswing in commercial space with hundreds of new companies formed over the world, and a few prominent billionaires (Sowers, 2019). Of course, this is admirable, but it remains a challenge to make revenue over cost without tapping into space markets.

3.3 Project Based Learning and the Ability to Explore Innovative Related Practices in Engineering and Aviation Science

Unmanned Aerial Systems (UAS or UAV) are becoming more and more involved in commercial operations. An observable event was on August 29th, 2016, in the context of Unmanned Aviation and the effect in establishing Part 107 for Commercial UAS Operations. This addition to the FAA's handbook allowed for certified pilots to use their UAS to make money. UAS in industries can help take tasks that were done less safe and make them get done faster and safer. Drones break the mold of conventional thinking. It leads UAS pilots to think in innovative ways and to use new technology to solve traditional problems. This keeps UAS as a fresh alternative to the way jobs are currently being done. The Eastern Shore of Maryland is known to most of the locals as a farming community. Nearly every road has a farm or pasture connected to it somehow. This makes it a fantastic location for UAS operations. Traditionally farmers would have to survey their land on foot or by vehicle and note the changes. Drones take that to the air. With UAS, farmers can see their whole property from an aerial view, but they can also use additionally tools like NADIR filters and Infrared Cameras to tell the overall health of their crops.

Precision Agriculture (PA), as defined by Sustainable America, seeks to use new tools and technologies to increase crop yield and profitability while lowering the number of traditional inputs that are needed. Doing less overall, to have more impactful results (Rogers, 2014). This line of thinking can be carried over to most usages of technology in the world today. Companies are making technology to simplify and speed up processes, i.e., smart watches, smart cars, and even smart refrigerators. Historically farmers would use plows attached to cattle, and almanacs based on last year's weather data as their tools.

Currently we have tractors with computers onboard, and timers attached to sprinklers to properly water plants. But as with everything in the tech industry, there is always room for improvement. Drones can be used to significantly boost how effective, and efficient; farming is. Looking at the data presented from the Italian research team (Daponte, 2019), they break down the effectiveness of using thermal cameras on drones for PA and how it works. Camera types are the primary focal point, these cameras are mounted to drones, or are integrated into the machine itself. Consisting of: RGB, thermal, multispectral, and LiDAR cameras (Daponte, 2019), each one brings back its own specific set of data. RGB and LiDAR aid in mapping the area, while thermal and multispectral provide the critical data points about vegetation health.

UAVs are a piece of unutilized technology in commercial businesses. There are plenty of instances in which drones could be helpful for companies to use. Like investigating power lines (Nguyen), or in the example of this paper, precision agriculture. Drones are far more than a camera on wings or blades. They are scientific research tools,

search and rescue vehicles, and another addition to the growing collection of tools that companies could use to improve efficiency. This paper is not to say that drones are necessary in every job, rather, they should be considered as an option to already existing methods.

Drones have the tendency to have a negative connotation at times. In a recent poll asking Americans if drones should not be allowed to fly near people's homes only 11% said that it should be allowed. These numbers were also showing that most people interviewed think that drones should not even be allowed at concerts or in use at crime 7 scenes (Hitlin, 2020). With such a negative overall perception of drones, it makes sense as to why they are not used nearly as much in commercial business. Precision Agriculture is important in general, but also important to those areas that could see drones in a negative light. PA aids farmers who could be wasting thousands on using the wrong methods to cure their crops. Drones deserve to be seriously considered as a legitimate alternative to traditional methods.

DVI or Normalized Difference Vegetation Index, is measured using red and Near Infrared light. It enhances the contrast between soil and vegetation creating a stark difference in what is living or unliving material (Fang, 2020). These NDVI cameras can also observe the water stress in crops (Daponte, 2019), making it far more useful than using the human eye to observe crops. Taking photos, is one thing, but using them for data collection is what really makes these cameras useful for PA. Photo mapping software like Pix4d, can create heat maps that take the GPS location of each photo, as well as the NDVI photo. They are then layered on top of each other to geolocate the relatively precise location of each pixel. The quality of this is based on how well of a survey the drone did at taking photos. These drones can be programmed for specific heights, speed, and distances. Along the programmed path the drones are programmed to take pictures every so often to create a large scan of the field. If the drone height is inconsistent, or wind is too strong, the finished product could become blurred, and the data could be skewed. Thus, making it imperative that the operator has a good understanding as to what they are doing.

4. RESEARCH METHODOLOGY

The problem to be investigated is space travel with regards to the future of aviation science education from students involving the private sector industry. Commercialization of space travel has always been a nonviable mission for the aviation industry since the early 2000s. Influenced by the vast cost associated with travel into the earth's atmosphere, also with other economic factors, human safety will be a primary drive to the research. Small Unmanned Aircraft Systems (sUAS) have been slowly introduced into the mainstream for years now, but their applications are just now being applied. In my testing, I wanted to see how useful the sUAS could be in an airport environment. To conduct the research, the students used the Mavic 2 Pro for the experiment. Various tests were taken including, runway inspections, perimeter monitoring, airplane inspections, and the relocation of wildlife.

The basis of space commercialization resides in the future idea of taking humans to space. The commercialization of space has been a long process that began in the early 1960s (Til, 2013). The first commercial satellite sent into orbit was to be used for telephone communications, which has marked the genesis of commercial space. The private sectors, however, have been involved in many manned and unmanned missions conducted by the National Aeronautics and Space Administration (NASA) (2021). Now that companies find themselves with the technological ability to further capitalize on space, there will not just be telecommunication satellites in orbit, space technology advance for human tourist will be established soon.

Commercialization of outer space orbital will provide the monetary incentive for the private sectors to ensure that the most efficient means of space travel is discovered. (Til, 2013). According to the vast growing work on the development of passenger space travel industry shows potential great economic value. Substantially funding for this subject will be a desirable variable for many points of view such as economically, socially, politically, also internationally.

The purpose of this study is to develop a methodological process in which the commercialization of space transportation can be achieved. The commercialization of space stations is essential for the growth of the space economy and achieving all the goals espouse for human activities in space (Sowers, 2019). This marks the beginning of a new era for humanity. Space transportation is still an expensive industry which mainly governments space programs can carry out in this generation. Looking into future times, when private aerospace development

companies become a visible commercial venture, then will space flight be at a reasonable price for adventurous individuals. With market surveys average (80%) of people between the age of 20 and 29 will be interested in space travel. The space tourism industry will represent 10% of the world's economy (Reggestad et al., 2000).

6. RESULTS

Currently, aircraft inspections involve getting close to the plane using ladders or lifts. All of which can be dangerous. With the incorporation of drones, it would not only be safer for the user, but it would also save time as well. The inspector could wear goggles to immerse himself into what the camera sees, while someone is the pilot's eyes, viewing the sUAS and making sure it does not collide with the plane. In our tests we used models that had the same shape as an airplane. We had setup an automated path 30ft above it and set it on a speed of 2mph to capture video of the pseudo plane. This test was hard to replicate as the chicken coup was not directly comparable to a real plane, but the application was still there. We managed to get footage of the entire top and sides of the building within about 4 minutes. This video can then be played back later after the inspection and can be just as effective as a person tethered to a crane or lift.

The entire research process was conducted over several months, and with the help of students. Runway inspections were the primary focus of this project to see just how useful a drone could be in conducting inspections when looking for damage or foreign objects on runways. The tests were conducted using automated flight patterns at the set speed of 3mph to keep the scanning times consistent. Currently, most runways are inspected by vehicle, or in person. Here are the following areas that PBL in the airport environment address:

- What we wanted to see was how efficient would it be to fly a drone over the runway?
- What height would be the most effective with runway inspections?

Similar to runway inspections, it is also important that airports view their fences and trees that border the runway. With this research, I was seeing how practical it would be to use drones in lieu of direct human contact. Our test was far less advanced but held up to what we had anticipated would happen. As with the flights before, we used the autonomous function of the Mavic 2 Pro. It helped keep consistent speeds, and the direction was altered to follow the fence line that we used in lieu of an actual airport perimeter (see figures below to examine the 20ft, 50, 100ft runway inspections).

Figure 1: The runway inspections and safety assessment for aircraft travel using project-based learning for the airport environment at 20ft.

Figure 2: The runway inspections and safety assessment for aircraft travel using project-based learning for the airport environment at 50ft.

Figure 3: The runway inspections and safety assessment for aircraft travel using project-based learning for the airport environment at 100ft.

The study examined several heights, 20ft, 50ft, 100ft, and 400ft. Each one had its strengths and weaknesses as mentioned below:

- 20ft was highly detailed but lacked the overall view of the runway. This would require more time spent flying, which could be in conflict with oncoming traffic.
- 50ft seemed like the sweet spot, it was close enough to see the whole runway, but not too high as to miss details. This seemed like the good choice for the size of the sUAS runway on campus o 100ft was ideal for covering more ground quicker than lower altitudes but did not offer the same level of detail.
- 400ft was maxing out the height limitation on the drone, as they cannot exit their airspace (400 ft). This height showed an incredible overview of the airfield and runway. At this height it would be near impossible to see small to medium sized issues. This height would be great for a quick scan 4 of the airport to make sure there are no large objects blocking the runways or buildings.
- These tests are relative to location. Some airports can make use of flying low and slow to the ground, while others would need to view more area at a time, making the higher altitudes more attractive

We had set a flight pattern to fly around the fence line and flew at roughly 25 feet directly above the fencing. From this height it was very obvious to check for damages or wildlife being too close to them. The practical applications are tremendous with sUAS. Using them would save on fuel consumption of vehicles doing perimeter checks and would save on the amount of manpower needed to watch the fences all the time. The only issues with this would be airspace and battery limitations.

6.1 Data Set and Findings

The survey questions were institutional research board (IRB) approved to obtain information about PBL and the community impact in engineering and aviation science of students' performance research in the classrooms. The students consider the theory of research to practice with commercial space and the PBL outcomes for community-based impact. This survey includes six (6) different questions about commercial space and the student projects regarding community impact in engineering and aviation education. The final report of each student's data has been examined to understand commercial space research and the practice to implement PBL with community-based impact under consideration. The findings are provided with the data set of each student perspective (see figures below).

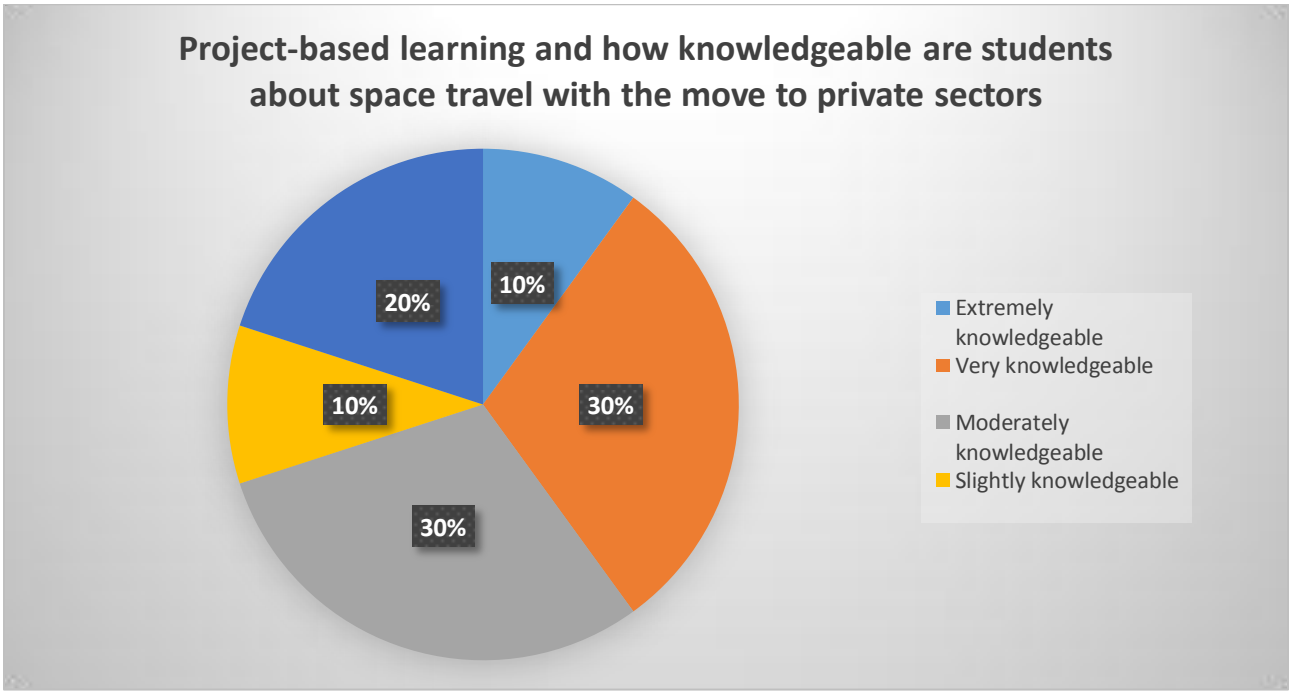

Figure 4: Project-based learning and how knowledgeable are students about space travel with the move to private sectors.

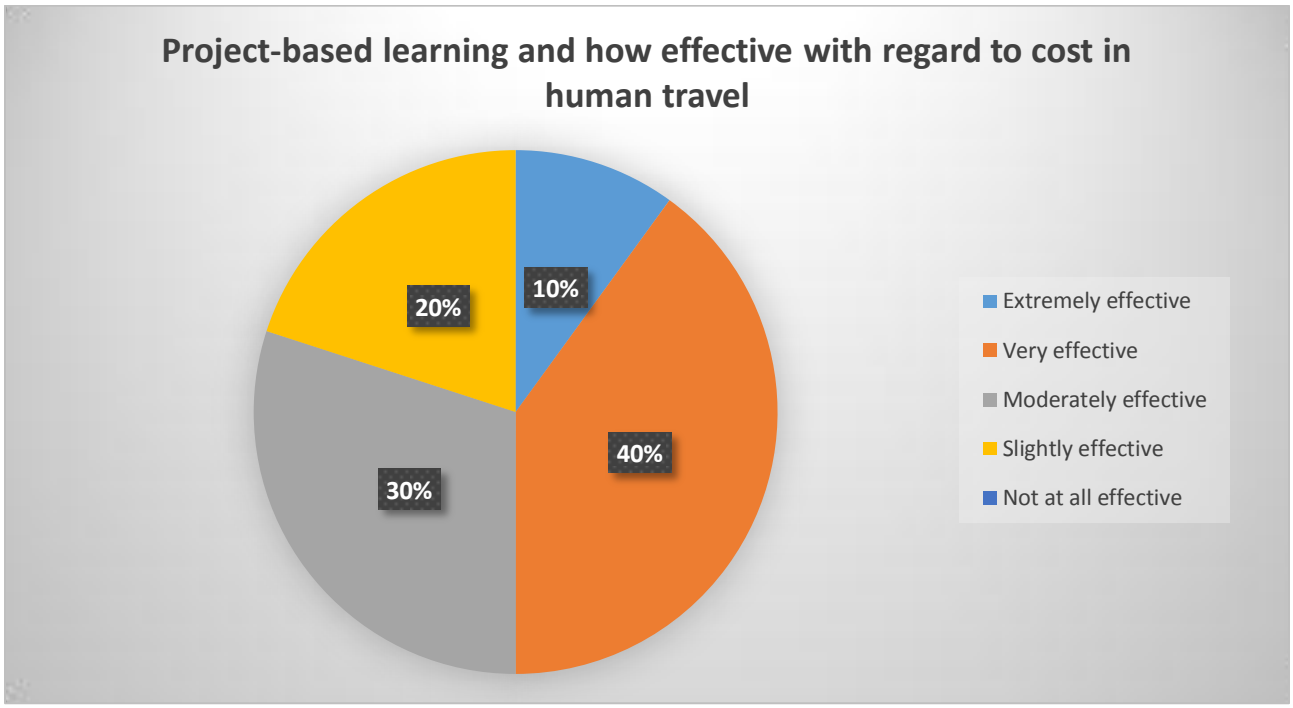

Figure 5: Project-based learning and how effective with regard to cost in human travel.

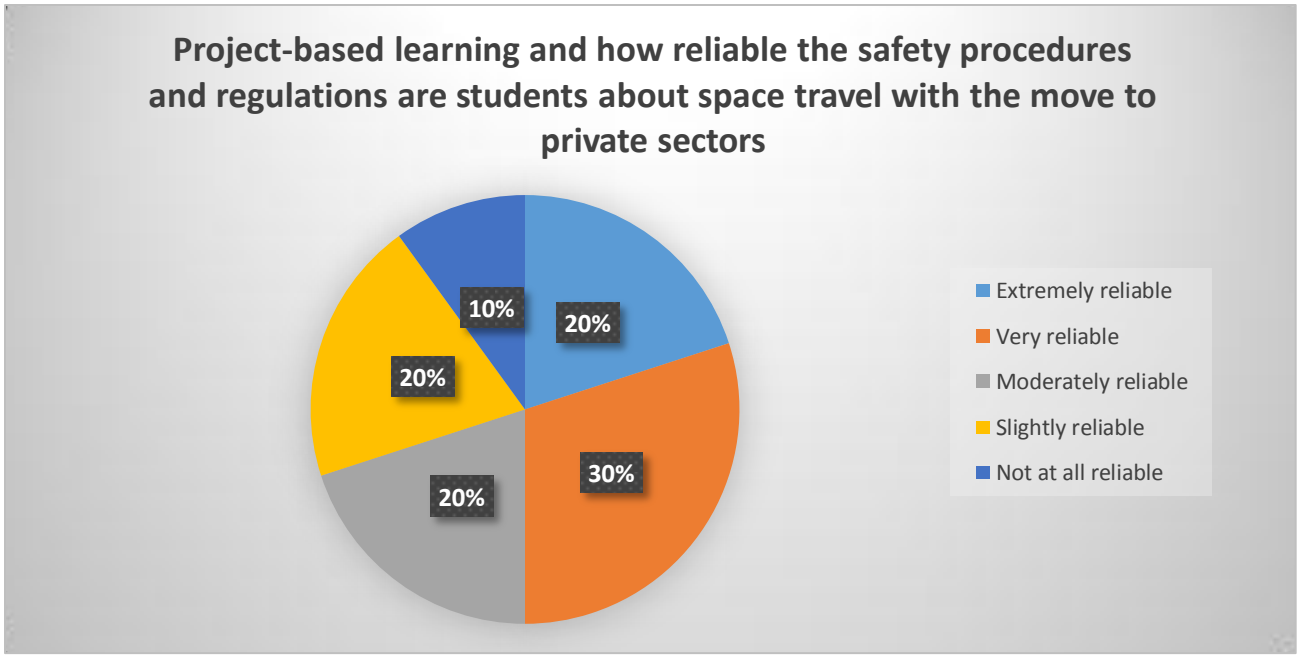

Figure 6: Project-based learning and how reliable the safety procedures and regulations are students about space travel with the move to private sectors.

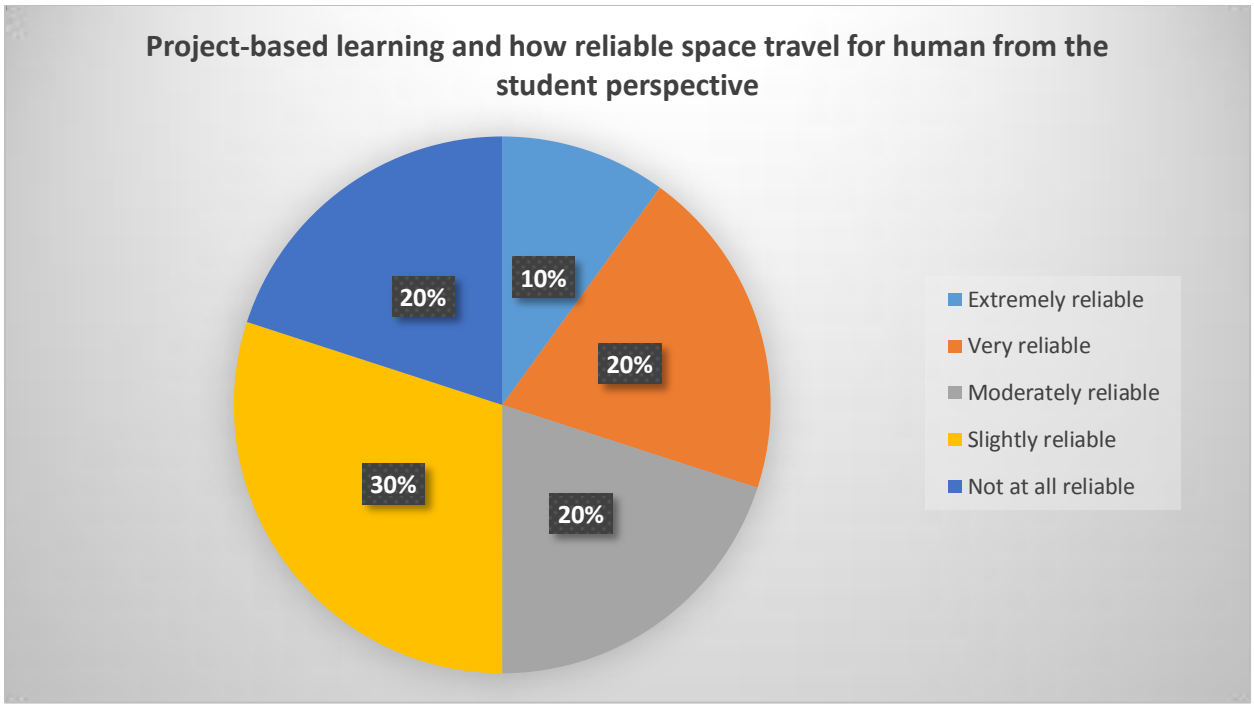

Figure 7: Project-based learning and how reliable space travel for human from the student perspective.

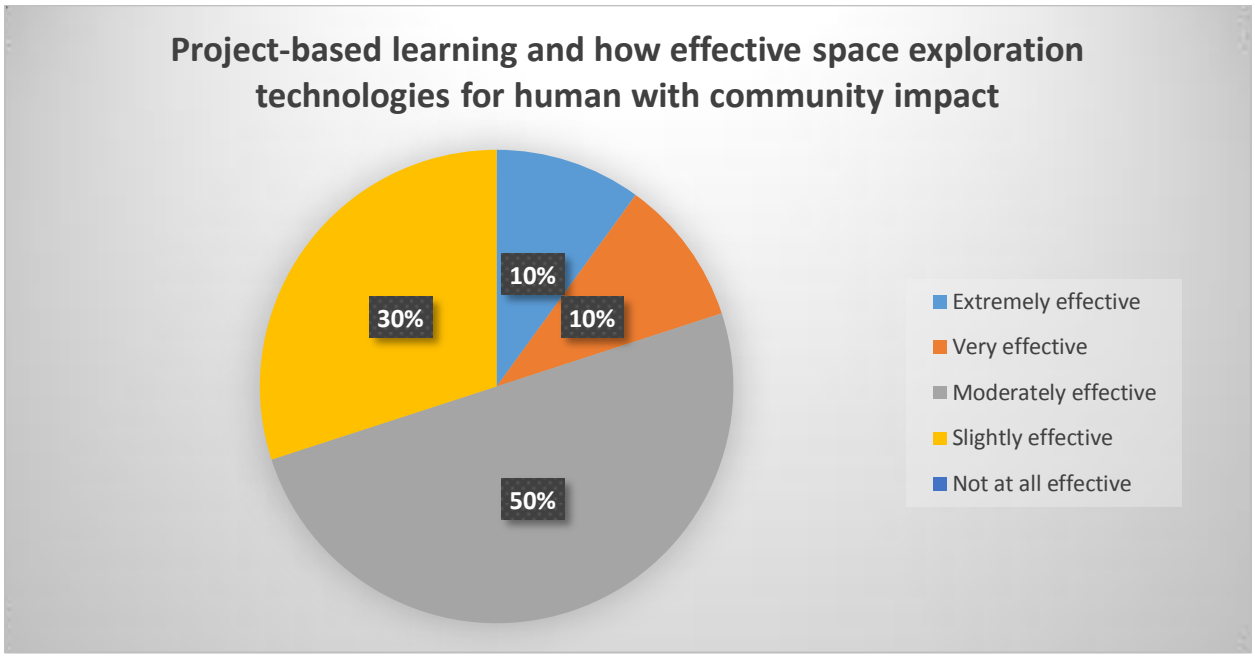

Figure 8: Project-based learning and how effective space exploration technologies for human with community impact.

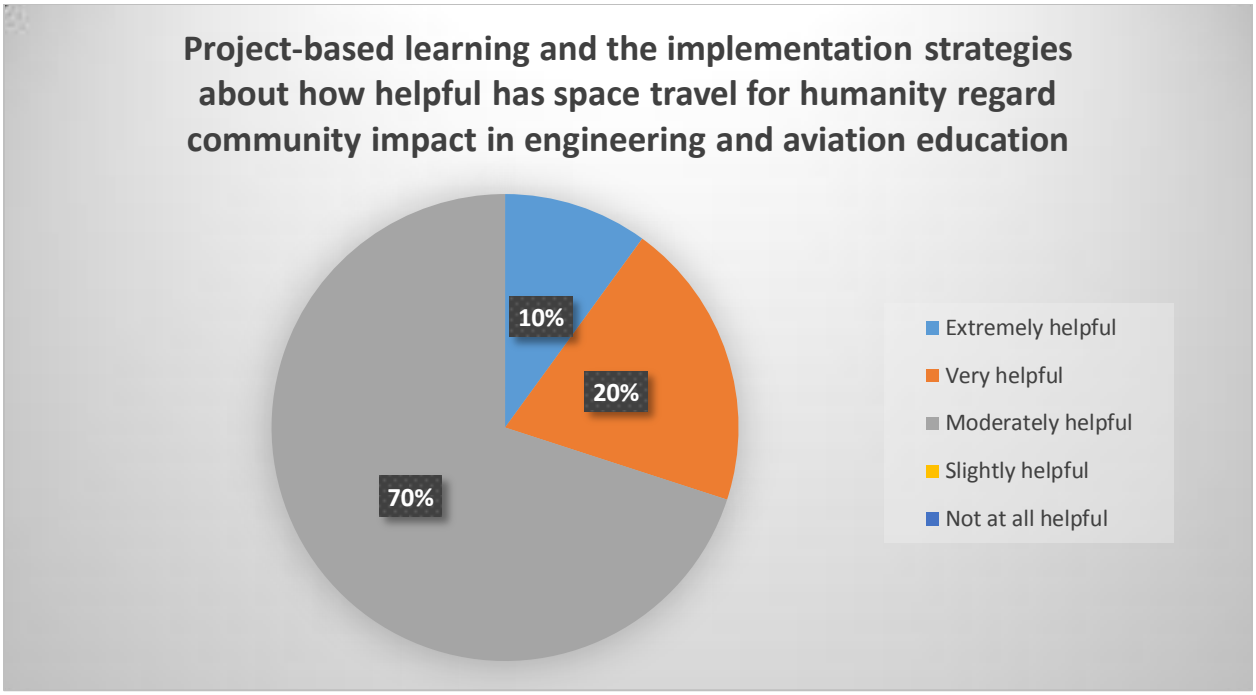

Figure 9: Project-based learning and the implementation strategies about how helpful has space travel for humanity regard community impact in engineering and aviation education.

Examining the survey results taken from the classroom, the commercialization of space study will become an effective case of study if proper safety procedures and regulations in practiced. Beginning with the first result of the survey question on the general knowledge of space exploration move the private sector. We can conclude on the awareness of aviation students on space travel to soon becoming an actual reality. Also, on the effectiveness of cost in human space travel. Though is still an expensive commodity to attain in our time, it's still a rational price when considering the huge cost to carry out space activities. Not also to forgetting one of the laws of selling in the free market: *revenues should exceed costs* (Sower, 2019). This sounds obvious but satisfying these simple criteria in the space companies has proven incredibly hard because most of their business is from the government.
Furthermore, is on the fourth question on the effectiveness of space technologies for humans. Theoretically, this proves the reliability of how much not just aviation students believe in space exploration technology but other fellow citizens looking onto the future of exploring. Lastly on how much potential the survey illustrates on the commercialization of space travel is the last question on the beneficiary of space travel to humanity. This question simply demonstrates how successful humanity will be when the commercialization of space stations is achieved.

7. CONCLUSION

The ability to examine education effectiveness and integration of PBL allows for both engineering and aviation science students to further explore specific practices for advancement in remote learning. This approach is critical and the introduction of learning outcomes in key discipline areas builds on problems identified within the community and practices. The study has identified set parameters to perform course-learning activities according to desired requirements provided from industry to address factors involving engineering and aviation education for community impact. The approach builds on modeling to examine challenges in specific engineering and aviation courses by exploring the relationship with STEM education and industry practices with regard to remote learning environments.

This interaction with industry officials to examine the course learning objectives using PBL for community impact aids the education measures to be defined based on the overall learning outcomes. The analysis and results will include the investigation of STEM practices to explore course-learning objectives provides a lifelong learning component with comparing pre- and post-COVID-19 delivery methods in engineering and aviation education. From the results, the study examines engineering and aviation industry requirements to integrate in PBL to promote

community impact among course learning outcomes. Our findings are supported by identifying core parameters necessary to bring awareness to PBL and the connection with STEM courses for advancement to the local industry and community involving engineering and aviation practices using remote learning methods.

An assumption regarding the conclusion of students using project-based learning in engineering and aviation research promoted growth of commercial space and community impact to address a new era for the human race. It will be an era where technological advancement will be developed beyond Earth. The alternative statement is for the growth of commercial space not being a new era for the human race. It will be an era in technology. The future vision of space exploration will place no limit on man's imaginations. Until the strong will of humanity keep exploring and developing, the technology of man goes on. Although the reality to know the understanding of physics of the universe, research pertaining to community impact should first be established in academic education using PBL. The study to address the research to practice provides a generation with the advancement of technology and the implementation strategies from a user experience.

The growth of commercial space will mark a new era for the human race. An era where technological advancement will be developed beyond Earth. The future of society will be influenced greatly by the ever-increasing growth of the space economy and achieving all the goals we espouse for human activities in space (Sowers, 2019). These drones could be set to schedules and automatically deployed with mission settings programed into them. The technology is out there, it is up to us as aviation professionals to harness and understand the new technology and make it benefit our rapidly growing industry.

Fortunately, project-based learning in academic research regarding space travel has made an assurance for citizens to reach the unreachable (Til, 2013). No longer will visiting space be a distant dream for the average person in coming times. With the power of the win-win free market innovation, touring consumers will make space travel a reality of research to advance engineering and aviation education for community impact.

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