

TESOL AND THE EXPLORATION OF SPACE

Because English is one of the dominant languages in space, it is fitting to show how the teaching and learning of English plays a vital role in daring to lead the Earth's global community to the far reaches of intergalactic territories. Humankind's ventures into space have always been closely associated with the English language. From the very first manned high altitude balloon flights that kissed the outer edges of Earth's atmosphere, to the visions of the international colonization of Mars and beyond, this study takes a glimpse of how English has been permanently interwoven into the very fibers of these endeavors. This work demonstrates the importance of English in all aspects of space exploration and emphasizes the need to help preserve and promote the use of English in Space via Education.

TESOL and the Exploration of Space

The theme of this year's TESOL International Convention in Tampa, Florida is "Daring to Lead." What better subject to talk about, then, than the leading role TESOL can take in the exploration of space? Space exploration is a global effort involving many countries in the international community countries such as Japan, Switzerland, Italy, Spain, Canada, and Brazil to name only a few. English is the dominant language in space where these members of this global community gather round in order to effectively communicate far beyond the grips of Earth's gravity. Men and women from all of these countries and from all walks of life are participating in a fabulous journey to the unknown. But how do they learn the communal language of this exploration? This paper will look at three major

periods in the spectrum of mankind's quest to know the universe and extend itself beyond the cradle of the mother planet. It will show how the teaching and learning of English has played, continues to play, and will play a vital role in leading the human spirit to the far reaches of intergalactic territories. The paper will be divided into three parts, conveniently categorized by the historical development of space exploration.

History

The first space explorers were daring young military men that actually did not quite make it all the way into the depths of outer space; however, they kissed the edges of it and reached the upper regions of the stratosphere to receive magnificent, close-up views of celestial bodies. Manned, high-altitude

balloons made the first pictures of the curvature of the Earth possible. In 1935, Albert W. Stevens of the U.S. Army Air Corps took pictures from his Explorer 2 balloon at a peak altitude of 72,395 feet (Ordway III, Adams & Sharpe, 1971, p. 93).

Navy Commander Malcolm D. Ross and civilian Charles B. Moore reached the upper atmosphere in a United States Navy high altitude balloon. On November 28, 1959, nestled in their balloon gondola appropriately named Strato-Lab, just outside of Rapid City, South Dakota, the balloonists ascended to a record height of 81,000 feet before descending and safely landing near Manhattan, Kansas the following day. They took the English language with them. The event was chronicled by U.S. Navy photojournalist, Lt. Commander Richard Jack Mumford, who laminated the project into articulate words that the entire English-speaking world could understand through the media of press, television and radio (Mumford, U.S. Navy Photo). Subsequently, Commander Ross went on to establish a record manned flight of 113,739 ft. on May 4, 1961 (Ordway III, Adams & Sharpe, 1971, p.93). The race to outer space had begun.

Although these events were just a beginning, manned, high altitude balloons proved to have severe limitations in the ascent to outer space. Several balloon disasters brought the demise of this type of exploration, but not before bringing to humans valuable data necessary to push much further into the stratosphere and beyond. Rocket-powered airplanes (e.g., X-15) and the birth of rocketry discouraged manned high-altitude balloon exploration on earth; however, the future of balloon exploration looks bright for their reconnaissance potential.

The use of rockets for space exploration was the logical step forward, and it was a man by the name of Wernher von Braun who stepped forward and brought the vision of space travel and exploration to a tangible reality. The father of modern rocketry, Wernher von Braun was German, caught in the terrible net of the ruthless Nazi regime. However, to communicate with the people who actually had the resources for space exploration, the Americans, Wernher von Braun, out of necessity, needed to speak English. Because of his genius in rocketry, he needed very desperately

to convey his knowledge in English, especially due to the circumstances in which he found himself. To work with Americans and help with his invaluable knowledge of science and technology, Wernher von Braun would have to convey this knowledge in the English language and convey it effectively. He did this by learning English the hard way: total immersion in the culture.

When he first came to the United States towards the end of WW II, his knowledge of the English language was quite limited. However, once Wernher von Braun was in the United States, his extroverted personality allowed him to mix easily in the American culture. Before long, von Braun's knowledge and unyielding enthusiasm for the conquest of space compelled him to convey his message to the masses (Dickson, 2001, p.68). This was accomplished through the media of television. One of the most popular programs of the day (1954), "The Wonderful World of Disney," allowed von Braun to effectively deliver his message. Author Marsha Freeman (1993) described the series in the following way: "The films combined imaginative animation of trips to space stations and the Moon and sequences with actors with appearances by the consulting experts, such as von Braun, to explain the basic concepts of rockets and space travel" (p.235).

Wernher von Braun became a household name in the United States (Dickson, 2001, p. 19). This could be attributed largely in part to his verbal skills and his ability to reach the American public via the English language. He had come a long way from the throes of Hitler's regime to freely speaking English to a people hungry and open to creativity and imagination.

When human beings first started going up into space, they took the spoken English language with them. The first sub-orbital flights were short and most of the language spoken was technical using original expressions such as "A-Okay", "Roger," "All systems go," and "I read you loud and clear." Curiously, each word or expression had its own fraternal evolution. For example, Author Tom Wolfe (1979) explained that the famous expression "A-Okay" "was borrowed from NASA engineers who used to say it during radio transmission tests because the sharper sound of "A" cut through the static better than "O" (p.270).

Not too much time was allotted for looking out the Mercury capsule's window and peering into the blackness of space. What little time was reserved for that produced such awe that words were few and far between. The first words of Alan Shepard, the first American in Space, were, "What a beautiful view" (Wolfe, 1979, p. 261). When orbital flights extended the time in space to over an hour, English language expressions still did not evolve all that much. John Glenn, the first American in orbit, managed to quickly blurt out, "Oh! That view is tremendous" (Wolfe, 1979, p. 320). The final Mercury flight with Gordon Cooper's historic 17 orbits around Earth produced such descriptive, heavily-Oklahoma-accented expressions as, "Feels good buddy... All systems go," "Working just like advertised," and "Down there's the Himalayas" (Wolfe, 1979, p.407).

When human space flight expanded to the Moon, the first experience was still so awe inspiring that words had little effect on describing the experience and the views. On the way to the Moon, Apollo 8 astronaut Jim Lovell said the following: "I'm looking out my center window which is a round window, and the window is bigger than the earth is right now." Mission Control responded, "That must be quite a view." On the same mission, astronauts Anders, Lovell and Borman were so strapped with words upon orbiting the Moon that they simply read to planet Earth the first ten chapters of Genesis from the Bible and left it at that. "In the beginning, God created the heaven and the earth..." (Barbour, 1969, pp. 150-151).

Neil Armstrong's now famous quote, "That's one small step for a man, one giant leap for mankind," was well rehearsed on Earth well before it ever reached the Moon. Astronaut Pete Conrad's first words on the Moon were not too much more articulate. Climbing down from the ladder on Apollo 12's Lunar Lander, the moonwalker stated exuberantly: "Whoopee! Man, that may have been a small step for Neil, but that's a long one for me" (Collins, 1988, p. 156).

Although these words have now gone down in history for the world to ponder, they did little to effectively describe the experience. Neil Armstrong, an engineer by trade, was never a man for words anyway; but his brilliance as a test pilot, astronaut

and moonwalker well compensated for any linguistic shortcomings.

When short one-week round trips to the Moon gave way to much longer stints in space, the better the descriptions of the experience became. Long, two-week plus orbital missions of the space shuttles provided space explorers more time to savor the experience and contemplate the significance of Earth's place in the universe and mankind's place on Earth. More vivid, creative, and expressive language started to emerge in the astronauts' repertoire of language and vocabulary. For example, Story Musgrave (1999), legendary astronaut who helped to repair the Hubble Telescope, started writing poetry about the experience of space walking and then having to confront a mammoth vehicle with the planet Earth serving as a backdrop to the scene. Musgrave's many spirited poems, such as "Pockets Filled with a Picnic Lunch," "Spacial Speed," and "Oh Bahamas," capture the very human essence of space flight by using vivid, descriptive adjectives and powerful, animated words that tantalize the senses (Musgrave, 1999).

Of course, Story Musgrave had formal, advanced training in the English language, which probably enabled him to think on a poetic level and write with the beautiful, impressive vocabulary that he uses in his poetry. Even with all his advanced degrees in science, he managed to obtain a Master of Arts degree in Literature from the University of Houston in 1987 (Musgrave, 1999). This also reaffirms astronaut Michael Collins' call for more people with a dominion of language to explore space; "What the space program needs is more English majors" (Farmer & Hamblin, 1970, 121). Story Musgrave heeded this call. The description of planet Earth, captured in written, poetical form by an orbiting shuttle astronaut – like a star streaking across the planet – had come a long way since the last Mercury astronaut crudely blurted out between tasks: "The Himalayas are down there."

The space shuttles also serve as living language laboratories, especially when the crews are comprised of many nationalities for each flight. Although the first space shuttle crew members were mostly Americans, it was not long before it became common practice to find that many space shuttle missions were predominantly

international in nature. Space shuttle crews became a literal potpourri of men and women representing a wide variety of cultures from around the world. They proved to the world that people from diverse countries, backgrounds and genders could live and work in space in peace and harmony for the betterment of planet Earth. The English language was there, serving as a Lingua Franca for all on board.

Each astronaut from a non-speaking English country had to have experienced his or her own relationship with the English language previous to the flight, either by using and studying it from early childhood, taking formal courses in their formal education, or having to take special preparatory crash-courses in order to survive with the other crewmembers. The crew members had to learn the special vocabulary that accompanied the spacecraft itself: for example, the cabinets to store foodstuffs, the kinds of tools used to do repairs, the names of the countless buttons to be pushed on every panel and gadget, etc., etc. Simply knowing the original space flight vocabulary such as "Roger", "A-Okay", "All systems go" and "Read you loud and clear," was no longer sufficient.

The entire space shuttle program is peppered with international flavor. It could never have been the same without this global participation. Other participating countries with international astronauts on board the varying shuttle flights included the following: Canada, England, Spain, Peru, France, Italy, Russia, the Ukraine, India, China and Japan (NASA, n.d.). This potpourri of nationalities gathered around the English language in order to make their missions a success.

The first space mission that really brought two different language speaking nations together is a good example of linguistic collaboration. The Apollo – Soyuz mission in 1975, although not recognized in its time as a monumental accomplishment, really set precedence in the advancement of mankind beyond the borders of its own atmosphere. The coupling of the two very different spaceships and the uniting of the two very different countries with opposite cultures and political ideologies on Earth, brought to mankind a sense of commonality heretofore never experienced

(Hartmann, Miller & Lee, 1984, pp.23-25).

The language barrier was not easy to overcome, however, and both the astronauts and the cosmonauts alike found themselves in very uncomfortable and awkward circumstances in the beginning of their union. The article "An Orbiting Partnership Is Born," succinctly described the tenseness of the situation: "In a 1997 interview, Stafford described how they got around the language problem. 'Each crew would speak his own language, and the other would have to understand,' he said. It just wasn't working, until Stafford and the Russian backup commander had the idea to speak in the other's language. 'So we started,' he said, 'and boy, it worked slick as a whistle'" (2005). These space-faring men from two distinct nations on Earth had to study every aspect about each other, which established a foundation from which all future long-term manned space ventures would have to follow.

The subsequent American space shuttle project is a prime example of this cooperation. However, the project has seen its share of disasters: the Challenger and the Columbia disasters have sparked serious setbacks and delays in the NASA program. Nevertheless, the spirit of humanity persists, and even after these major disasters, the space shuttle program still marches on with renewed vigor and purpose.

The major goal now is to use the shuttles for the final stages of construction of the International Space Station (ISS). The ISS is designed to function as mankind's permanent flagship in orbit, serving as a home for human beings from a wide variety of nations and cultures on Mother Earth. The principal countries involved both financially and materially are English speaking (The United States and Canada); however, Russia carries its own language and customs on board as well, along with other countries of interest such as Japan, Brazil, and the European countries of Italy, France, Spain, Belgium, Denmark, Germany, Holland, Norway, Sweden, Switzerland and the United Kingdom. Surely, many languages will be used in the vast array of experiments on board the ISS. Nevertheless, because of the United States' dominant vested interest in the undertaking (in both financial and human resources), English proves to be the Lingua

Franca of the vessel. This requires that the language be a virtual necessity to know and understand by all who visit, whether they are scientists, commanding pilots or just plain visitors.

Visitors in space are becoming commonplace. The first American space tourist, Dennis Tito, seemed to have started a trend. He paid twenty million dollars for his one-week visit to the International Space Station. Escorted by two cosmonauts in their Soyuz 2 Taxi Flight capsule, Russian Yury Baturin and Kazakh Talgat Musabayev (from , (Kazakhstan)), Tito was received by the American occupants of the station in a rather unceremonious manner. In order for Tito to prepare for the visit, he had to undergo training at the Gagarin Cosmonaut Training Center at Star City, just outside of Moscow. Included in his training was a crash course in the Russian language so that he would be able to understand the basics of human space flight. Without it, communication would have been kept at a bare minimum, and the safety of the space flight would have been compromised (Karash, 2001).

Actually, it was Dennis Tito's 10-day Soyuz TM-32 flight on April 28, 2001 that sparked the need for professionals to establish certain standards for space flight for all categories of professionals. Foreign language learning was a high priority. In November of 2001, an official group at NASA was organized to do just that: The ISS Multilateral Crew Operations Panel (MCOP). This panel undertook the responsibility to establish the criteria, principles, and practices of crew selection, and the training and certification of ISS crew members, whether they be professional Astronauts or Cosmonauts, or simple space flight participants such as those from the Expedition Crew Members or Visiting Crew Members (Multilateral Crew Operations Panel [MCOP], 2002).

Apart from general medical and behavioral suitability, the linguistic ability highly ranks in importance for the ability to participate in modern day space flight. The code is quoted as follows: "Oral and reading fluency in the English language is a requirement for all ISS candidates. In addition, the ability to communicate effectively in other languages may be required. Candidates must possess both the capacity and the interest to learn a foreign language."

The code also emphatically states: "The sponsoring agency, in accordance with its internal procedures, will determine if its candidate has the interpersonal and communication skills necessary to function as a successful member of a space flight team in a multicultural environment and has the ability to demonstrate situational awareness to conduct himself or herself effectively in the space environment " (MCOP, 2002).

Even before the training of Dennis Tito, the idea of space tourism was skyrocketing as extremely wealthy individuals and private mega-corporations were gathering keen interests in the idea. Sir Richard Branson, of Virgin Atlantic, was one of these individuals. He and his entrepreneurial partners managed to join forces and forge a space enterprise called Virgin Galactic. The premise of this endeavor is to bring space tourism to the common human being. In the spirit of Henry Ford, for bringing the automobile to the masses, and Charles Lindbergh's flight of his Spirit of St. Louis inspiring the modern airline industry, Sir Richard Branson hopes to create his own legacy by bringing space flight home as a common occurrence. Branson's philosophy is expressed in the following statement: "We hope to create thousands of astronauts over the next few years and bring alive their dream of seeing the majestic beauty of our planet from above, the stars in all their glory and the amazing sensations of weightlessness and space flight. The development will also allow every country in the world to have their own astronauts rather than the privileged few" (The next giant leap, n.d.).

By using their revolutionary space plane, which will not require cumbersome booster rockets with solid fuel to launch a vehicle into space such as NASA's Space Shuttle, the idea is to simply fly the plane into a sub-orbital pattern and return the visitors safely by landing on the concept of a simple airplane landing strip. Furthermore, the 3-day training sessions are so drastically reduced that they hold no comparison with the months and months it requires to train at NASA or at the Gagarin Space Training Center (When can I go, n.d.). The language of instruction will be English; therefore, anyone who would be interested in such an adventure from a non-English speaking country

would have to study and know English at least to a certain degree. Space flight for the common person has truly met its time and place – and the English language is there to meet the challenge.

Another firm, Space Adventures Ltd., has recently set up shop in the state of Florida to begin what they believe will be a very innovative and lucrative program for space tourism. Encouraged by the Governor of Florida, Jeb Bush, this company is presently undertaking a feasibility study to establish sites for offices and a spaceport that will serve the general public interested in becoming “Space Tourists.” The company’s projected time frame for beginning their 90 – minute flights is in three or four years, costing approximately \$102,000 per person (Blake, 2005, p. A1). This is a far cry from Dennis Tito’s initial ticket cost. Furthermore, the direct, healthy competition with Virgin Galactic will spark even more human activity in space, all in the spirit of productive capitalism and entrepreneurship.

And this is just the beginning of space tourism. Many creative people envision not just a simple three-hour thrill ride into space, but imagine entire orbiting hotels that can accommodate literally hundreds and eventually even thousands of guests for unlimited periods of time. Surely, the English language will play an integral part in this vision and add completely new dimensions to the terms of hotel management and space tourism. Specialized courses will have to be designed and taught by English language specialists trained in this type of venture.

From the Space Shuttles, the International Space Station, to Space Tourism, the English language accompanies mankind on all these incredible adventures. It can clearly be seen how necessary it is for the English language to be learned and learned well, especially when humans are involved in using the language in such a hostile environment as space.

With so many countries involved in this common goal of safely exploring the limitless boundaries of space, it is absolutely vital that the common language they use is taught and learned effectively. It is therefore the responsibility of English language teachers around the world and related organizations such as TESOL to meet the task head on with imagination and

enthusiasm. One of the first and best ways to initiate this enthusiasm is by taking a trip to the Kennedy Space Center itself.

The VIP Kennedy Space Center Tour

Special passes obtained at the Kennedy Space Center can allow visiting groups access to various high-security facilities such as the International Space Station Processing Facility, the Orbiter Processing Facility, and the Vehicle Assembly Building. General Admission passes offer tours through the Apollo Saturn V Center and the IMAX movies. The great number of visitors to the KSC Tourist Complex, speaking dozens of languages throughout the establishment, serves as strong testimony to the global interest in space. The IMAX movies, entitled *The Dream Is Alive* and *The IMAX International Space Station – 3-D*, vividly show the human habitat in space and demonstrate how the international community can live and work as one. The films also illustrate how language plays an important part in this collaboration. Even though many languages are used on board, English prevails as one of the most necessary and dominating languages for the station’s day-to-day operations and its long-term survival.

The academic spin-offs of the trip are immeasurable. They can add a whole new dimension to class activities for language learning. The trip initiates expansive windows for discussions and debates. Even the sensitive national debate of whether or not space exploration and space travel is necessary, considering all the problems humans face on Earth, can take precedence in any classroom discussion. Students can be assigned compositions or imaginative role-plays about the Kennedy tour and the grand space venture. Renewed energy in the classroom can restore interest and purpose in learning.

To expose ESL students to the space experience really does not require special treatment. The regular tours of the Kennedy Space Complex can be exciting and educational on an individual basis or in groups. The Kennedy Tourist Complex sponsors free tours for school children throughout the academic year. Sixth-Grade Day, or Eighth-Grade Day, for example are reserved for respective county schools. ESL

groups could do the same, reserving special days and requesting guides specially trained in English language learning to serve as hosts.

If going to the Kennedy Space Center itself were not feasible, then the next best alternative would be to bring the Kennedy Space Center to the classroom. There is a host of videos, films, books, works of art, and posters and picture albums available to take into the classroom that would provoke interest and thought about humankind's ventures into space. NASA itself has a very tastefully designed and comprehensive Website that offers information ranging from the history of NASA to its visions of the future. The Website offers promotional material and even advertises employment opportunities that are related to the agency. NASA also has a television network that provides a myriad of clips, including cartoon skits for children, educational classes on Astrophysics for the more serious minded students, to actual clips of astronauts living and working in the space vessels themselves. The availability of pedagogical materials and ideas for ESL classroom activities is only limited to the teacher's imagination.

TESOL and the Future in Space

Back in the early 1950s, Wernher von Braun had a comprehensive, long-term vision of mankind venturing into space. This dream consisted of first placing a space station into earth orbit, then accomplishing a series of lunar landings, which would eventually lead to establishing permanently manned, lunar outposts, and then finally reaching the ultimate goal of human beings achieving expeditions to Mars by the mid- twenty-first century. In reality, Wernher von Braun's visions were not that far off the target. Although his time frame for all of these plans may have been inaccurate, the genius of rocketry simply could not have foreseen the complexities involved with the funding of the projects, the politics, the public interest, and the technology. Nevertheless, his visions still seem to remain intact, for the International Space Station is still going strong. The finalization of construction is projected by the year 2010; a permanent manned lunar outpost is planned by NASA to be established by the mid 2020s; and finally, the first manned mission

to Mars is projected to be between the years 2040 and 2050 ("50-Year Goal," 2003). With the United States leading a consortium of countries around the world, Americans will take their language with them, meaning that English will play a predominant role in human beings communicating with one another on all of these projects. This will also mean that a great many of the future space explorers daring to partake in this grand adventure will have to know English and know English extremely well in order to survive in the new environment. Effective communication will be vital: a common Lingua Franca will be paramount. The English language will be there.

English will be the dominating communication force in the establishment of Moon bases and the colonization of Mars. The envisioned terra-forming of Mars and the total transformation of the planet will surely entail the accompanying evolution of new languages and dialects branching out from the mother tongue of English. Like the Germanic dialect in centuries past, new literatures will form as well as new philosophies, new sciences & mathematics – in effect, new civilizations of humankind in our solar system. The prospect is extremely exciting and is limited only to one's imagination.

Although English, of course, will not be the only language in space, it probably will be the most prominent language used in order to serve as a common Lingua-Franca for all space-faring beings. From the very beginnings of human space travel, international cooperation has been essential, and the underlining thread of communication for this cooperation with the leading country has been the use of the English language. From the genius of rocket scientist Wernher von Braun, all the way to the internationals occupying the International Space Station, every person associated with this global effort has had his or her own relationship with the English language to a certain degree – whether it be by intensive formal study, or by self-taught methodologies. Whatever the case, just as new technologies evolve with every forward step humans take in space exploration, so will our profession in teaching the English language to international space-faring students. It is our dutiful job as linguists, as

teachers, and as educators to work with the language, to preserve it, to promote it, to help evolve it and carry it to places far beyond what we can ever fathom right now in the present. Teaching English to speakers of other languages will play a vital role in an adventure that is still very much in its infancy.

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