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ISU in an era of partial reconvergence

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Knowledge, as Socrates would have it, is the "only one good" and is universal in value; but knowledge, as Bacon would have it, is also "power" and power is particularized: Those with the power may not want to share it. Which to serve, the universal truth or the particularized power.

-- Educator Clark Kerr1

1. ABSTRACT

The International Space University was founded in 1987 to provide young space professionals with an international, multi-disciplinary approach to space education. The organization has held six 10-week summer sessions at which students from throughout the world have studied space. In 1995, ISU plans to begin a one-year Ph.D.-level program in space studies.

This paper examines the educational goals of ISU in the context of current education trends. It discusses how trends toward internationalism and interdisciplinary studies are reshaping both education and the aerospace field. The tensions that exist between ISU's conflicting goals are discussed in the context of these prevailing currents.

2. INTRODUCTION

There's an old saying that timing is everything. ISU's timing was especially fortuitous; the university's founding and development corresponded with a number of substantial political, economic, and technological trends that are transforming both aerospace field and higher education. The main trends common to both of these areas is a move toward internationalism coupled with an increasing emphasis on interdisciplinary education. The changes are bringing about many benefits but also a great deal of tension as the old is gradually replaced by the new. ISU's public relations often makes it appear that the school is unique and is doing things that no one has ever done before. The reality is the university is not setting trends so much as being at the forefront of them, and applying methods and tools used by others in a new manner and a new field (space). The leaders of the university has been very shrewd in judging these trends and exploiting them.

3. EDUCATION AND INTERNATIONALISM

The multicultural and multinational characteristics embodied

within ISU are not new; they go back to classical times. However, the definition of higher education, and the relationship between the university and internationalism, have undergone major changes over the past 2,500 years. The world might be entering a new era in which education will become even more internationalized.

Educator Clark Kerr divides the history of higher education into three phases: convergence, divergence, and partial reconvergence.

The first phase, convergence, dates back to Classical times. This phase was marked by the establishment of institutions open to all who were included within a particular civilization. "Scholars and students were drawn from within the entire orbit of the civilization of the time and placed without reference to nationality, and they studied what they wanted to without intended external guidance or constraints by nation-states."2 This era was, of course, subject to the constraints of the prevailing religious and political doctrines. Three key attributes involved a single curriculum, a single scholarly language (Latin), and one religion each (Muslim and Christianity).

Kerr dates the period of divergence back to the Reformation, which gave rise to nation-states and divided the Western university world into Catholic and Protestant sectors. A number of academic models proliferated as nations-states created their own university systems. These systems were designed to help create governments in: building institutions; promoting common languages, cultures, and national histories; training people to participate in economies; providing for national defense needs; and accomplishing other national goals. Universities thus became an integral part of training people to become leading citizens of their nations.

The systems remain splintered today. For example, the European Community has implemented the European Course Credit Transfer System to facilitate the recognition of university degrees and courses across national boundaries. Students who completed academic work in one country have often found it difficult to receive credit at institutions in another nation.

Writing in 1991, Kerr said that the world has entered a "confused period of partial reconvergence" that heralds "a second great transformation" in education. This era has been marked by the integration of Europe and the entrance of the former Soviet Union and China back into the international education world. Coupled with other economic and social trends and new information technologies, education and academic research is increasingly being done across national borders.3

3.1 Educational Examples

International commerce has been a major driver of internationalism, and academia has responded to help meet the needs. INSEAD -- the European Institute of Business Administration -- was founded

at the start of European integration in 1958 to meet the needs of the European business community. The school, located in Fountainbleau, France, offers a one-year MBA program that includes a broad multi-national, multi-disciplinary curriculum. INSEAD typically includes about 300 students from about 30 nations, as well as an international faculty from approximately 15 nations.4 Thus, the program is very similar in scale and scope to what ISU plans for its master in space studies degree in the central campus. What ISU will likely create is an INSEAD for space.

The EC has been at the forefront of efforts to break down the pattern of divergence. The community's ERASMUS program, initiated in 1987, funds a variety of initiatives. Under the program, a university student from one EC nation can study abroad in another one. Further, ERASMUS funds a variety of joint educational programs between universities in different nations.5

Another trend is interdisciplinary approaches. This has resulted from the increasing interconnection of many elements of the world; it creates for managers and leaders to see the bigger picture. A number of top engineering schools have initiated interdisciplinary educational programs. The Massachusetts Institute of Technology (MIT) offers a joint engineering/management degree that is aimed at teaching engineers a broad approach to these fields. The program, which is done in conjunction with 11 major manufacturers, includes intensive classroom training as well as practical experience through internships.6

3.2 Tensions

The trends toward international and interdisciplinary approaches have not been without problems. At the heart of partial reconvergence lies a tension between, on the one hand, the universal nature of the search for truth and knowledge, and on the other hand, the power that is at the root of this knowledge.

> Two of the several "laws of motion" currently propelling institutions of higher learning around the world are (a) the future internationalization of education of learning, and (b) the intensification of the interest of independent nation states in the conscious use of these institutions for their own selected purposes.7

Despite the increase of internationalism, economic competition continues to put pressure on national leaders to improve education as a way of bolstering competitiveness. Military tensions have forced leaders to stifle the free flow of knowledge. All of this creates an undercurrent against internationalism.

> A major challenge remains: how to demonstrate to the "average citizen" the benefits of a public university's involvement in world affairs. This is no easy task, particularly given the difficult economic times. Universities, particularly public ones, are experiencing

social and political pressures to focus on local, state and national issues. In the coming century, the challenge for American higher education will be to persuade our constituents of the necessity--and value--of adopting and nurturing a major international focus.8

4. ISU AND PARTIAL RECONVERGENCE

ISU is dedicated to reaching full convergence. It is an institution that is open to all people of the world, regardless of citizenship or political persuasion. And it aims to foster increased cooperation among all countries of the world in space education and exploration while avoiding any strong connection with military activities. The knowledge that is gained in space exploration would be available to all, and the more advanced space powers would share it with those less advanced.

Yet, in a larger sense ISU is still operating within the partial reconvergence framework described by Kerr. Space exploration is in a similar period of transition. The major space programs were founded based on Cold War competition. The end of the Cold War has coincided with other developments that include a leveling of technological capabilities, increased costs, and economic problems to encourage unprecedented efforts in international cooperation. At the same time these internationalist trends have run into counter forces aimed at maintaining domestic industries and competitiveness. ISU must strike a delicate balance: encourage internationalism while not posing too much of a threat to the status quo. Otherwise, the space agencies and other organizations that support the organization would simply stop providing money and personnel, and ISU would collapse.

The constraints of partial reconvergence can be seen in a less than subtle manner at ISU. Under the ideal of convergence, the ISU would be dedicated to discovering essential truths and knowledge unfettered by the demands of a particular group. However, two forces are at work within ISU that have led to a state of partial reconvergence.

The first force is ISU's own ideology. The university's three founders -- Peter Diamandis, Todd Hawley, and Bob Richards -- as well as many of their collaborators came from the ranks of space advocacy organizations. Diamandis founded the Students for the Exploration and Development of Space (SEDS) while an undergraduate at MIT. SEDS promotes space among young college students. Hawley was involved in running the Young Astronauts Council, which promoted space among children. The founders are disciples of Gerard K. O'Neill and Arthur Clarke--futurists who believe it is mankind's destiny to explore and eventually settle space on a large scale. The founders spoke seriously of eventually having the permanent campus in orbit.

ISU is the grandchild of SEDS, and it possesses many of its predecessors genes. Under full convergence, education is to be

free to search for essential truths unfettered by outside demands. ISU is dedicated less to this ideal of education than to social engineering on an ambitious scale. The idea was less to create a university than to win over disciples who would work to further human prescence in space. Diamandis described the philosophy with a near evangelical fervor.

> What drew (the founders) together was something we called the benign conspiracy.....The concept was that we were all working to subvert the minds of all the people in future positions of power out there, subvert them or convert them into people who supported and wanted to develop space. To take you as someone is coming in who might like space and so forth but through the ISU experience to help you see the same benefits and the good of international and multidisciplinary studies, and so that when you're successful in wherever you go, when it comes time 30 years from now, Doug, I can pick up the phone and say, Doug, it's time. We have got to make this thing happen. And the benign conspiracy, through ISU and through SEDS earlier, to get the contacts and the capability someday to influence the world at a critical moment, at a cusp point....It is not an entity onto itself, it is a mechanism for facilitating space development. It's a machine, it's a living entity as best we could design it.
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> In my mind, the means is more important than the ends.....If in the end, you tell me that ISU did not accelerate the development of space one iota, I've failed. ISU is a waste. If you tell me that a permanent university is never formed, but it accelerated the development of space because it pulled people together, it developed concepts, then its been a total success.9

Most alumni describe ISU as an intense social experience, giving generally lower marks to the academic aspects. The emphasis the university places on social and cultural activities is good in that it helps to break down a lot of barriers. The intensity of the experience assists in creating deep friendships and a network of contacts around the world. This international "ISU family" could have a substantial impact on how space exploration is conducted if its members rise to high positions of power. Further, many alumni have also expressed satisfaction with the university's multi-disciplinary, multi-national approach. The students have undertaken design projects that take an international approach to space.

The second force at work within ISU is the relationship between the university and its main sponsors, which include major space agencies and corporations. Although it is difficult to generalize, most of these organizations are involved in ISU for more practical reasons instead of philosophical ones. They want the employees they send to ISU to come back with experience in

working into an international, multi-disciplinary setting. The sponsors also use ISU to promote their programs through lectures and also design projects that advocate particular initiatives. The university also gives the sponsors a chance to evaluate young space talent. These are all useful activities for a university to undertake.

4.1 Academic Constraints

At the same time, however, ISU's ideology and its relationship with the main sponsors has seriously retarded the academic program in some respects. The university is more interested in serving in an advocacy role--promoting a set of goals and objectives -- than in analyzing whether these objectives make any sense. ISU is so keen on space development that the institution has lacked the necessary distance from the subject matter that is necessary for critical analysis. ISU does do very well in exposing students to many different disciplines, thus improving the scope of their knowledge. But, much of the information is presented in a conference-like setting, and respect for all beliefs and concepts is stressed. The evaluative aspects are weak.

For a school that prides itself on a multi-disciplinary approach, ISU's view of space's role in society appears slightly myopic. The summer sessions succeed, to varying degrees, in making connections between disciplines, such as relating engineering to policy and law. However, ISU's vision is largely focused on space, and does a generally poor job of putting space into the larger context of human existence. ISU's general view is that space exploration is the most important thing mankind can undertake; this is an extraordinary claim for anyone to make about any undertaking, and one that deserves some critical analysis. The reality is that few people outside the space field view things in these terms, and they are correct in taking this view. Some aspects of space, such as telecommunications and remote sensing, are ubiquitous aspects of modern life; other aspects such as human exploration are luxuries.

The connection between ISU and its main sponsors has had some detrimental impacts on the program. The university has no real financial independence, and it is heavily dependent on support from governments and private industries. Thus, it is an organization that seeks to challenge the status quo while relying on those same traditional organizations for its existence. The other element of this equation is that both ISU and the sponsors are interested in promoting space activities. As a result, the academic program has suffered at times. Some lectures are substantive, while others appear to be little more than exercises in public relations and "selling" of initiatives.

The idea of an underground guerrilla movement -- a Fifth Column -- working to subvert the world is a bit scary. If these words were spoken by a religious fanatic, a terrorist or a radical

political leader, they would sound downright chilling. An honest educational effort should not include conspiracies of any sort, nor should it involve any overt political agenda. Further, inclusion in the "ISU family" should not be seen as the main criteria for success; otherwise, a space Mafia will be created that will only further its own interests.

4.2 Transitions

A major redefinition of ISU's main goals is looming. The university is preparing to transition to a full-time degree program. ISU will be running a one-year, Ph.D.-level program beginning in 1995. The aim of the school is ambitious: to become THE training center for future leaders in the space sector. ISU officials would like to see their program as a pre-requisite for a person who wants to advance his or her career.

The transition is likely to lead to a much different ISU. First, the academic standards are higher than the master's-level summer session. In order to be successful, ISU will have to create a serious program. The program also will be aimed to a large degree at professional audience. The expectation is that companies will sponsor them as a way of obtaining better employees.

Further, the program will likely allow some students to take the program in stages, possibly over two or three years. This means a modification of ISU's main goal of having a small number of students get together in an intense experience. The social and networking aspects of the program will continue to be important, but they will be more diffused. As a result, the coming transition could be marked by a tension between serving the university's original promotional goals and creating a more sober-minded program aimed at meeting the needs of a market niche.

5. CONCLUSIONS

ISU's program includes many positive aspects. The emphasis on international and multi-disciplinary studies involves the application of major educational trends to a new field of space. The program's approach, which mixes social and academic elements, has served to break down many barriers between people of different nationalities and disciplines. It represents a unique laboratory where young space professionals can get together to learn.

The period of partial convergence is characterized by a conflict between an emphasis on internationalism and strong pressure on nations to use educational institutions for their own purposes. The situation with ISU is similar in scope, although it is not nation-states and their demands that are creating the tensions. Instead, the tensions exist because of a conflict between ISU's desire to promote space and the need for an academic institution to have some critical distance from the subject matter it covers. Another aspect of the conflict revolves around the relationship between ISU and its main sponsors.

It should be stated that it's not a matter of doing one thing or the other exclusively. Conflict always exists in education between the demands of specific groups. Institutions of higher learning serve a number of different functions, and the real challenge is to find an appropriate balance between the elements. Education is similar to a stool held up by three legs. One leg embodies the requirement to give students practical skills they can use in their professional careers. Students will not spent $20,000 to $30,000 for the MSS program without this assurance. The second leg involves providing government and industry with a skilled labor force, and conducting research work for these sectors. ISU cannot survive without the financial support of these institutions. The third leg involves honest academic inquiry that searches out essential truths.

Interviews with alumni show that many of them are satisfied with the career experience and the international contacts gained at ISU. Further, ISU's sponsors appear generally pleased with the benefits they are receiving from their support of the university. Seven organizations bid for ISU's central campus, and another 18 have signed on as affiliate campus as part of the university's global campus system. The program is not without its substantial problems, and much improvement in quality is needed if ISU is to run better summer sessions and grant a credible degree in its full-year MSS program. The key aspect of international and multi-disciplinary education is that anyone can do it; however, doing it well is another matter.

It is the third leg -- academic inquiry -- that needs to be strengthened. Academic should not embody promotion and evangelical proselytizing but rather a sober-minded search for the truth that embodies critical analysis. ISU has often crossed the line in this regard, presenting space as being more important than it is in reality. Part of the academic content has been more to promote particular ideas/projects/space agencies/companies than to provide any real analysis. Yet, ISU could not have been established if its founders had not been very enthusiastic about both space and the need to further internationalize it. This excitement helps make the ISU sessions so interesting.

The question of whom ISU serves is a key one as the institution transitions from a summer session effort to a full-time program. Will ISU continue its advocacy role, remaining true to the founders' vision? Or will it lose a lot of its ideology, becoming just another institution that will produce better bureaucrats for ESA, NASA, and Rockwell International? ISU must work to find an appropriate balance so that its various educational elements complement each other.

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The papers presented at the conference reflect the multidisciplinary nature of the International Space University (ISU) and its alumni. The first papers presented hold special relevance to the design projects, and cover such topics as lunar-based astronomical instrumentation, solar lunar power generation, habitation on the moon, and the legal issues governing multinational astronauts conducting research in space. The next set of papers cover various technical issues such as project success assessment, satellite networks and space station dynamics, thus reflecting the diverse backgrounds of the ISU alumni.

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